Black Horse Pike Regional School District Curriculum

ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Course Name: MATH FOUNDATIONS 2 – Math 180 – Course 2

Course Number: 113120

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title: Math Foundations II– Math 180	**Unit Summary:** **In this unit students interpret motion and represent it with graphs showing time and distance traveled.**
Grade Level(s): **10** **Essential Question(s):** **COURSE II** **Concepts in Block 1** **Big Idea 1:** **How can we use visual models such as diagrams, graphs, and tables help us to communicate information?** **Big Idea 2:** **How can we compare quantities to reason with numbers to make decisions?** **Topic 1: Distance-Time Graphs** **Topic 2: Representing Rates** **Topic 3: Comparing Rates**	Students will be able to: • Understand diagramming as a useful planning tool. • Describe motion in a graph using precise language. • Describe segments in a story graph using precise language. • Describe segments to analyze and interpret a story graph. • Determine the distance and time it takes to travel a route. • Interpret motion in story graphs. • Represent motion with a table showing distance and time. • Interpret motion in a distance-time graph and represent it in a table. • Interpret a distance-time graph to calculate the speed of an object. • Use distance and speed to determine the total time a vehicle travels. • Reason with tables to compare distances. • Compare rates by analyzing graphs and tables. • Reason with graphs to compare distances. • Reason with graphs to compare quantities. • Analyze graphs of multiple linear equations to compare rates and solve a multi-step problem.

Learning Target	NJSLS or CCSS:
Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.	6.EE.C.9-
Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.	6.RP.A.3a-
Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?	6.RP.A.3b-
Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.	7.G.A.2-
Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.	7.RP.A.1-
Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.	7.RP.A.2d-
Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	7.RP.A.3-
Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.	8.EE.B.5-
Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	8.F.B.4-
Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.	8.F.B.5-

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

Inter-Disciplinary Connections:

Real-World problem solving examples: To solve problems related to fields of logistics, environmental science, sales and marketing, public services, Art and Design, entrepreneurship & business, entertainment, information technology and health science.

Students will engage with the following text:

Math 180, Scholastic, Inc. 2014

Students will write:

Writing/Open Ended questions: Students will explore how math is used in logistics, organizing, and planning.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Students will uncover and build skills through various classroom activities. Investigating number sense activities, modeling examples, using real-life application, using note-taking strategies, and using SMARTBoard technologies will all be explored. Other learning experiences could include alternative lesson openers, math and history applications, problem solving workshops, interdisciplinary applications and extra examples of problem solving.
Suggested warm-up activities, instructional strategies/activities, and assignments:

Course II **Volume 1:** **Block 1 Rates in Time:**	Essential Question: How can we use visual models such as diagrams, graphs, and tables help us to communicate information? How can we compare quantities to reason with numbers to make decisions?
Topic 1 (Lesson 1):	
FOCUS AND MOTIVATE	Build Career Awareness Block Preview: Have students analyze the Career Explorations on mSpace page 8 to explore careers in the field of logistics. Introduce the Anchor Video "Speedy Delivery" Guide students to make connections between logistics and rates.
Teach Teaching Options	Lesson Objective: Understand diagramming as a useful planning tool. Language Goals: Use the term: "data" to describe the given information in a problem. Use the terms "logistics" and "route" to describe the movement of people and goods. Teach: Read a Multi-Step Problem

		Students analyze a multi-step problem to plan an efficient delivery route for a business. Read It! Read the Problem. Mathematical Thinking: Persevere and Solve Problems, Expand Your Business, Location Data, Use the Vocabulary Routine to teach data. Analyze It! Analyze the Problem. Develop a Delivery Plan Grade-Level Content Connections: Geometry mSpace p. 10-11 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Comparing Routes Solve the problem: A new 1-mile road is constructed connecting your headquarters to customer D. Should the driver use this road? Explain your reasoning. I think the driver should _____ because _____. Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 11
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 10-11. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Describe motion in a graph using precise language. Language Goals: Use the terms "distance" and "time" to describe motion. Use the terms horizontal axis, vertical axis, and "line" when discussing motion as it relates to the graph. Do Now: Create Structure Build It: Students analyze data and organize the information into a table by comparing the speeds of transport methods. Have students share responses and think about other visual models that can be used to describe speed or motion.

		Mathematical Thinking: Make Use of Structure Teach: Model Describing Motion in a Graph. Play the Instructional Video: "Describe Motion in a Graph" (Optional) Model the steps of describing the motion of a train. Step 1: Find the distance the object travels. Step 2: Use the graph to find the distance. Step 3: Find the time the object takes to travel. Step 4: Use the graph to find the time. Mathematical Practice: Make Use of Structure mSpace p. 12-13 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Describing Motion Describe the motion of the train. The train travels _____ meters in 6 seconds. What happens to the distance as time increases? Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 13
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 12-13. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
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	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Describe segments in a story graph using precise language. Language Goals: Use the terms "change" and story graph to describe a graph with non-uniform rate. Use the term "part" to describe line segments on a story graph. Do Now: Develop Number Sense

		Tell Me All That You Can: Students analyze a graph showing the motion of a truck. Have students share their responses and use the shape of the graph to describe rate. Mathematical Thinking: Model With Mathematics Teach: Describe Motion in a Story Graph Model the steps of describing the motion of a train. Step 1: Find the change in time in part A. Step 2: Find the change in distance in part A. Step 3: Describe the motion in part B. Grade-Level Content Connections: Functions mSpace p. 14-15 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Students use fraction pieces to compare two fractions that have unlike denominators. Exit Ticket: mSpace p. 15
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 14-15. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Determine the distance and time it takes to travel a route. Language Goals: Use the terms "distance" and "time" when explaining the route traveled. Do Now: Evaluate Solutions Who's Right?: Students evaluate and compare graphs to correctly identify the graph that matches the story described. Have students share their responses. Ask questions to have students identify the mistake and how to correct it. Mathematical Thinking: Reason Abstractly

		Teach: Rate Race (Level 1) Students practice finding the time a vehicle takes to travel when the distance is known. Step 1: Select a vehicle and a starting corner. Step 2: Record the terrain and the rate the vehicle travels in that terrain. Step 3: Record the distance and divide it by the rate to find the time taken to travel across the terrain. Step 4: Trade turns and choose your next terrain. The player who travels across the map in the shortest amount of time wins the race.
	Checking for Understanding	Summarize and Assess: Review Interpreting a Story Graph Interpret the story graph. Which part represents the train traveling the slowest? Explain. The train is traveling the slowest in part _____ because _____. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 18-19.
	Practice and Apply Assigning Homework	Play game in pairs on mSpace pages 18-19. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Topic 1 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Solve problems by writing and evaluating equations with fractions. Language Goals: Do Now: Develop Game Strategy Brain Arcade: Students find possible factor pairs for the product 60 in the game Circles. Have students share their responses and identify a possible factor pair that doesn't appear on the game board. Mathematical Thinking: Persevere and Solve Problems Teach Rate Race (Level 1) Students practice finding the time a vehicle takes to travel when the distance is known. Step 1: Select a vehicle and a starting corner. Step 2: Record the terrain and the rate the vehicle travels in that terrain. Step 3: Record the distance and divide it by the rate to find the time taken to travel across the terrain. Step 4: Trade turns and choose your next terrain. The player who travels across the map in the shortest amount of time wins the race.

		mSpace p. 18-21 Play game in pairs.
	Checking for Understanding	Summarize and Assess: Review Game Strategy Answer this question: You choose the hovercraft as your vehicle. Which corner would you start at? Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 21
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 18-21. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Interpret motion in story graphs. Language Goals: Use the terms "distance" and "time" to describe motion. Do Now: Evaluate Solutions: Who's Right? Students analyze the points on a graph describing the motion of a skater. Have students explain their reasoning and think about other representations used to track motion. Mathematical Thinking: Attend to Precision Teach: Solve a Problem Together Guide students through the steps of interpreting a story graph on mSpace page 24. Step 1: Analyze the problem. Step 2: Identify the lines on the graph. Step 3: Solve the problem. High-Leverage Practice: Lead a Discussion mSpace p. 24-25 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess:

		Review Describing Motion Select all that apply: Students select all correct answers that relate to the story graph. Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p. 25
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 24-25. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Represent motion with a table showing distance and time. Language Goals: Use the terms "column" "meters," "row," and "seconds" to describe recording motion in a table. Do Now: Identify Numerical Patterns Find the Pattern: Students analyze data and use patterns to find an unknown quantity. Have students share their solutions. Ask questions to help students identify the pattern. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of using a table to represent motion of a truck on mSpace page 26. Step 1: Interpret a row in the table. Step 2: Find the distance the object travels. Step 3: Find the time the object takes to travel. Step 4: Complete the table. mSpace p. 26-27 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess:

		Review Representing Motion With a Table Solve the problem: Record the time and distance the truck travels. What happens to distance as time increases? Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 27
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 26-27. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Interpret motion in a distance-time graph and represent it in a table. Language Goals: Use the term point to describe a specific location on a graph. Use the phrase "after ____ seconds" to describe how far an object has traveled in a given number of seconds. Do Now: Develop Estimation Skills Make an Estimate: Students reason quantitatively about estimates of time for activities using a table. Have students compare answers. Ask questions to help students reason about making estimates. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of using a graph to interpret the motion of a bus on mSpace page 28. Step 1: Use the graph to find the distance. Step 2: Use the graph to find the time. Step 3: Describe the highlighted point. Mathematical Thinking:

		Make Use of Structure Step 4: Complete the table. Use the Vocabulary Routine to teach point. mSpace p. 28-29 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Interpreting a Graph Find the error in the table and fix the math. Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p. 29
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 28-29. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Interpret a distance-time graph to calculate the speed of an object. Language Goals: Use the term per to express speed in a unit of time. Define speed as the amount of distance an object moves in one unit of time. Do Now: Develop Number Sense Tell Me All That You Can: Students interpret and make sense of quantities in a table of values. Have students share their solutions. Ask questions to have students extend their reasoning about time and distance. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of determining the speed of a truck using a graph and a table on mSpace page 30. Step 1: Complete the table.

		Step 2: Describe the motion of the object. High Leverage Practice: Lead a Discussion Step 3: Describe the pattern. Step 4: Find the speed. Use the Vocabulary Routine to teach speed and per. mSpace p. 30-31 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Interpreting Speed Solve the problem: How fast is the ferry traveling? The ferry travels at a speed of _____ miles per hour. Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p. 31
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 30-31. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Use distance and speed to determine the total time a vehicle travels. Language Goals: Use the terms "distance" and "time" when explaining the path traveled. Do Now: Develop Game Strategy Brain Arcade: Students select a number on the turntable that makes the equation true in the game DJ Why. Mathematical Thinking: Reason Abstractly Teach: Rate Race (Level 2) Students practice finding the time a vehicle travels through a terrain.

		Step 1: Select a vehicle and a starting corner. Step 2: Record the terrain and the speed your vehicle travels in that terrain. Step 3: Record the distance of the terrain and divide it by the speed. Step 4: Record the time your vehicle takes to travel. The player that travels across the map in the shortest amount of time wins the race. MSpace p. 32-35 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Answer this question: Would your next move in Rate Race be to travel through one or two cells of grass terrain? Explain. I would move through _____ of the grass terrain because _____. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 35
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 32-35. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 3 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Reason with tables to compare distances. Language Create Goals: Understand and use the term "constant speed" to describe the relationship between distance and time. Use the terms "ahead of," "behind," and "farther" to compare distances. Do Now: Structure Build It: Students create a visual model to solve a problem involving a model train traveling around a track. Guide students to draw an appropriate diagram to understand and solve the problem. Mathematical Thinking: Model With Mathematics

		Teach: Solve a Problem Together Guide students through the steps of comparing distances traveled while driving in the snow and in the rain on mSpace page 38. Step 1: Find the speed of the first object. Step 2: Find the distances the first object traveled. Explore: Have students examine the relationship distance has with rate and time. Step 3: Find the distances the other object traveled. Step 4: Compare the distances. Grade-Level Content Connections: Functions mSpace p. 40-41 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Comparing Distances Select all that apply: Students select all correct answers that relate to the speeds of two runners during a marathon. Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p. 41
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace 40-41. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 3 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Compare rates by analyzing graphs and tables. Language Goals: Use the term "faster" to mean traveling an equal distance in a shorter period of time. Use the term "steeper" to describe the qualitative features of a graph. Use the term constant to mean not changing. Do Now: Develop Flexible Thinking

		Brain Teaser: Students solve a riddle to find the greatest number of songs that can be purchased for a certain price. Mathematical Thinking: Persevere and Solve Problems Teach: Solve a Problem Together Guide students through the steps of using a graph to compare the speeds of two trucks on mSpace page 40. Step 1: Make a prediction. Step 2: Find the speed of the first object. Use the Vocabulary Routine to teach constant. Step 3: Find the speed of the other object. Step 4: Compare the speeds. High-Leverage Practice: Lead a Discussion mSpace p. 39-40 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Comparing Speed Solve the problem: Use the graph to compare speed. Train _____ travels faster than train _____. Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p. 40
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 39-40. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
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	Topic 3 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Reason with graphs to compare distances. Language Goals: Use the phrase "compare distances" to describe the difference between two distances. Describe the faster object as the one that travels a greater distance in an equal amount of time. Do Now: Identify Numerical Patterns

		Find the Pattern: Students analyze the relationships among expressions to identify a pattern. Have students discuss the rule used to identify the relationship between distance and time. Mathematical Thinking: Model With Mathematics Teach: Solve a Problem Together Guide students through the steps of using a graph to compare the distances traveled by two trucks on mSpace page 42. Step 1: Identify each line on the graph. Step 2: Find the distance object A traveled. Step 3: Find the distance object B traveled. High-Leverage Practice: Lead a Discussion Step 4: Compare the distances. mSpace p. 42-43 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Comparing Distances Using a Graph Solve the problem: Students analyze a graph to discern a pattern for finding differences in distances between two cars. Car B travels _____ meters farther than car A in 8 seconds. Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p. 43
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 42-43. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
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	Topic 3 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Reason with graphs to compare quantities. Language Goals: Understand and use the term "cost" (noun) to identify the amount of money that is paid for an item. Use rate to compare two different quantities measured in different units.

		Do Now: Evaluate Solutions Who's Right?: Students analyze a problem situation to determine who picked the better deal on video games. Ask students to share their solutions. Mathematical Thinking: Construct Viable Arguments Teach: Solve a Problem Together Guide students through the steps of comparing the costs of two types of gas on mSpace page 44. Step 1: Identify each line on the graph. Step 2: Find the first amount. Step 3: Find the other amount. Use the Vocabulary Routine to teach rate. Step 4: Compare the amounts. High-Leverage Practice: Lead a Discussion mSpace p. 44-45 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Comparing Quantities Solve the problem: Mark buys 10 gallons of gas for his motorcycle. How much does Mark save by buying regular gas? Mark saves $ _____ by buying regular gas. Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p. 45
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 44-45. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Analyze graphs of multiple linear equations to compare rates and solve a multi-step problem. Language Goals: Use the term "profit" in relation to "revenue" and "cost." Do Now:

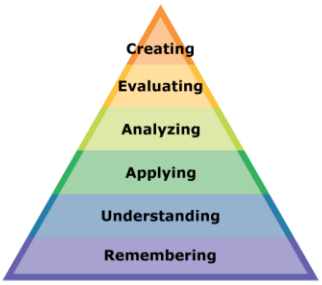
		Develop Flexible Thinking Brain Teaser: Students use multiplicative reasoning to solve a riddle. Mathematical Thinking: Make Use of Structure Teach: Read a Multi-Step Problem Students analyze data as a sales manager and assign hours to increase profits for the company. Read It! Read the Problem. Increasing Profits Analyze It! Analyze the Problem. Mathematical Thinking: Construct Viable Arguments High-Leverage Practice: Lead a Discussion MSpace p. 46-47 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Analyzing Profits Solve the problem: Miguel receives a pay raise of $2.50 more per hour. How much will his total profitability decrease by in 10 hours? Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 47
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 46-47. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Block 1 Performance Task	
	Teach Teaching Options	Lesson Objective: Develop a Customer Satisfaction Plan Students apply their knowledge of distance-time graphs and motion to solve a multi-step problem. Teach: Replay Anchor Video – "Speedy Delivery." Introduce Performance Task. Complete the Performance task mSpace p. 48-49 Evaluate: Students will be evaluated based on Performance Task Rubric Explore, Apply, and Analyze

	Practice and Apply Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	mSkills Curriculum Based Assessment 1	Review: To prepare students for mSkills: Download the Block 1 mSkills Strategy Lesson, Student Pages, and Annotated Student Pages to give students targeted practice with assessment item types based on current Block content. You may also teach the mSkills Demo Lesson to give students a general overview of assessment item types based on prerequisite content. Evaluate: To administer mSkills: Go to Class Settings and assign the mSkills assessment to students. Have students log in to the student software. Allow students to review the Problem-Solving Routine in the Administer: Reference Guide. The first 20 items will be digitally graded and available in Class Analytics Zone Progress. Enter scores to the constructed-response items in the SDP using the Scoring Rubric. Have students complete the Mindset Strategy in their mSpaces to reflect on their performance in the Block.

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on teacher observations, students doing quality of work together, questioning strategies, self and peer assessment, student record-keeping, quizzes, essays, Quizzes, tests, homework, class discussion, individual conferences, journal writing, performance tasks, diagnostic tests, homework, and projects

Accommodations/Modifications:

- Use manipulatives to build patterns or represent symbols.
- Provide Graphic organizers to use in solving problems.
- Provide guided notes/handouts. Break problems into smaller pieces.
- Have students keep and turn in a notebook.
- Review needed skills prior to the lesson.
- Provide checklists for solving problems.
- Provide students with a resource page that has multiplication charts, fractions pieces.
- Break problems and test sections into smaller pieces.
- Allow students extra time to complete projects.
- Provide students with an example of project for reference.
- Make a clear rubric for students to understand exactly what is expected.

Summative Assessments:

Periodic chapter tests, performance based assessments, state assessments, PSATs, End of Course tests, and SATs

Performance Assessments:

Projects, display of student work, and google classroom

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

<table>
<tr><td>Course/Unit Title:
Math Foundations II – Math 180
Grade Level(s):
10</td><td>Unit Summary:
In this unit students develop an understanding of rate and ratio.</td></tr>
<tr><td>Essential Question(s):
COURSE II
Concepts in Block 2
Big Idea 1:
How can use patterns to make predictions about data and estimate sizes?

Big Idea 2:
Like fractions and decimals, how are rates and ratios equivalent?

Topic 1: Comparing Quantities
Topic 2: Ratio Concepts
Topic 3: Equivalent Ratios</td><td>Enduring Understanding(s):
Students will be able to:
Apply rate concepts to a representative sample of data and make predictions.
Determine rates using repeated reasoning to solve unit rate problems.
Identify and use rates to solve problems.
Use the distance and time a vehicle takes to travel to determine the rate of speed.
Identify unit prices to compare costs and determine the lower and higher rate.
Analyze and solve problems with multiple rates using models.
Apply rate concepts to understand ratios.
Reason abstractly about ratio concepts.
Understand that a ratio is a multiplicative comparison of two quantities.
Identify and evaluate ratios using multiple visual representations.
Represent and solve multiplicative comparison problems with ratios using models.
Represent and solve ratio problems.
Generate equivalent ratios using models.
Use models to determine if two ratios are equivalent.
Use ratio and rate reasoning to solve problems involving measurement.</td></tr>
</table>

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the NJSLS or Common Core Standards that are applicable

Learning Target	**NJSLS or CCSS:**
Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction ½ ÷ ¼ miles per hour, equivalently 2 miles per hour.	7.RP.A.1-
Recognize and represent proportional relationships between quantities.	7.RP.A.2-
Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.	7.RP.A.2c-
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	8.EE.C.7b-
Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	8.G.C.9-
Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.	8.SP.A.2-

Inter-Disciplinary Connections:

Real-World problem solving examples: To solve problems related to fields of logistics, environmental science, sales and marketing, public services, Art and Design, entrepreneurship & business, entertainment, information technology and health science.

Students will engage with the following text:

Math 180, Scholastic, Inc. 2014

Students will write:

Writing/Open Ended questions: Students will explore how math is used in logistics, organizing, and planning.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Students will uncover and build skills through various classroom activities. Investigating number sense activities, modeling examples, using real-life application, using note-taking strategies, and using SMARTBoard technologies will all be explored. Other learning experiences could include alternative lesson openers, math and history applications, problem solving workshops, interdisciplinary applications and extra examples of problem solving.
Suggested warm-up activities, instructional strategies/activities, and assignments:

Block 2: Rates and Ratios	Essential Questions: How can use patterns to make predictions about data and estimate sizes? Like fractions and decimals, how are rates and ratios equivalent?
Topic 1 (Lesson 1):	
FOCUS AND MOTIVATE	Do Now! Build Career Awareness Block Preview: Have students analyze the Career Explorations on mSpace page 51 to explore careers in the field of environmental science.
Teach Teaching Options	Lesson Objective: Apply rate concepts to a representative sample of data and make predictions. Language Goals: Use a mathematical rule to describe a pattern. Teach: Read a Multi-Step Problem Students analyze a multi-step problem to plan a recycling cleanup project. Read It! Read the problem. Mathematical Thinking: Persevere and Solve Problems Cleanup Project Data Sample Analyze It! Analyze the problem. Develop a Plan Grade-Level Content Connections: Algebra mSpace p. 54-55 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
Checking for Understanding	Summarize and Assess: Review Applying Rates Solve the problem: Bin A items can't be recycled at the local center. 8 out of every 10 bin A items are recycled at specialized centers. How many of the 100 bin A items can be recycled at a specialized center?

		Out of 100 bin A items, _____ are recycled at a specialized center because _____. Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 54-55
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Determine rates using repeated reasoning to solve unit rate problems. Language Goals: Use the phrase unit rate to describe a rate that compares two quantities in a way that the second quantity is 1 unit. Use constant rate to describe motion when the distance is the same for each equivalent unit of time. Do Now: Analyze Problems Missing Numbers: Students analyze a number line to discern a pattern. Have students share their solutions and the steps they took to solve the problem. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of using a bar model and a table to determine and apply the rate that a conveyor belt sorts recycling on mSpace page 56. Step 1: Label each unit on the bar model. Step 2: Complete the table.

		Step 3: Find the rate. Use the Vocabulary Routine to teach constant rate. Step 4: Apply the rate. Use the Vocabulary Routine to teach unit rate. mSpace p. 56-57 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Determining Rates Solve the problem: Paper at a landfill decomposes at a constant rate. In 4 weeks, 12 pounds of paper decompose. How much paper decomposes in 12 weeks?_____ pounds of paper decompose in 12 weeks. Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p.57
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 56-57. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Identify and use rates to solve problems. Language Goals: Use the term "predict" when making an educated guess. Understand and use the term estimate when using mental math and calculations to make a prediction. Do Now: Develop Reasoning Skills Which Does Not Belong?: Students analyze a set of numbers to determine the pattern and identify the number that does not belong. Mathematical Thinking: Use Repeated Reasoning Teach: Solve a Problem Together

		Guide students through the steps of using a bar model to determine how long it takes a person to use 8000 pounds of paper on mSpace page 58. Step 1: Make an estimate. Use the Vocabulary Routine to teach estimate. Step 2: Label the bar. Step 3: Find the rate. High-Leverage Practice: Elicit Student Thinking Step 4: Apply the rate. mSpace p. 58-59 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Using Rates Solve the problem: In 5 months, firefighters responded to 80 wildfires. At this rate, how many wildfires will the firefighters respond to in 8 months? The firefighters will respond to _____ wildfires in 8 months. Mathematical Thinking: Model with Mathematics Exit Ticket: mSpace p. 59
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 10-11. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 4):	
	Teach Teaching Options	Teach Rate Race (Level 3) Students practice finding the speed at which a vehicle travels. Step 1: Select a vehicle and a starting corner. Step 2: Record the terrain and the distance your vehicle travels. Step 3: Record the time it takes to travel through the terrain. Step 4: When you've traveled across the map, divide the total distance by the total time to find your average speed. The player that travels across the map from one corner to the other matching corner with the fastest average speed is the winner.
	Checking for Understanding	Summarize and Assess:

		Review Game Strategy Explain your reasoning: You are driving the SUV. Which terrain would you avoid traveling through? Explain. I would avoid traveling through _____ because _____. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 60-63
	Practice and Apply Assigning Homework	Play game in pairs on mSpace pages 60-63. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Topic 1 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Identify unit prices to compare costs and determine the lower and higher rate. Language Goals: Understand unit price as the price for one unit of an item. Use the term "cost" as a noun, such as "the cost of an apple." Do Now: Develop Flexible Thinking Brain Teaser: Students develop number sense and perform multiple operations by solving a riddle. Have students share their responses. List the possible digits on screen. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of comparing the rates for mini solar panels at two different stores on mSpace page 64. Step 1: Make a prediction. Step 2: Find the first unit price. Use the Vocabulary Routine to teach unit price. Step 3: Find the second unit price. High-Leverage Practice: Lead a Discussion Step 4: Solve the problem. mSpace p. 64-65 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Identifying Rates to Compare Costs Solve the problem: A market sells 3 plums for $6.60. A grocery store sells 4 plums for $9.60. Which place sells plums at a lower rate? The _____ sells plums at a lower rate. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 65
	Practice and Apply	Solve problems in pairs on mSpace pages 64-65.

	Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Analyze and solve problems with multiple rates using models. Language Goals: Use the terms product and sum to describe solving a rate problem. Do Now: Evaluate Solutions Who's Right?: Students analyze the relationship between quantities in a compost recipe. Mathematical Thinking: Attend to Precision Teach: Solve a Problem Together Guide students through the steps of using a bar model to determine the total amount of waste collected on mSpace page 68. Read It! Read the problem. Show It! Represent the problem. Solve It! Solve the problem. Check It! Check your work. Explore: Guide students to solve the problem using an alternate method. mSpace p. 68-69 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Comparing Rates Solve the problem: Tori, a geologist, records 1 major earthquake for every 6 minor earthquakes. Tori records 10 major earthquakes. How many earthquakes does Tori record altogether? Tori records _____ earthquakes altogether. Mathematical Thinking: Model With Mathematics

		Exit Ticket: mSpace p. 69
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 68-69. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Apply rate concepts to understand ratios. Language Goals: Understand and use the term ratio to describe a comparison of two quantities. Understand that the term multiplicative means that two quantities are related by multiplication. Do Now: Identify Numerical Patterns Find the Pattern: Students analyze the relationship between the number of park trails and distance to determine missing quantities in a table. Mathematical Thinking: Persevere and Solve Problems Teach: Solve a Problem Together Guide students through the steps of expressing the relationship between the number of bags and the cost of organic soil as a rate and a ratio on mSpace page 70. Step 1: Find the rate. Use Think-Pair-Share to have students discuss the terms rate and unit rate. Step 2: Complete the table. Step 3: Express the ratios based on the given rate. Use the Vocabulary Routine to teach ratio. Step 4: Find the multiplicative relationship. Use the Vocabulary Routine to teach multiplicative. mSpace p. 70-71 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Connecting Rates to Ratios

		Solve the problem: A store purchases 10 boxes of recycled paper for $240. Express the relationship between the number of boxes and the cost as a rate and a ratio. Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 71
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 70-71. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Reason abstractly about ratio concepts. Language Goals: Use the phrase "multiplicative comparison" when describing the relationship between quantities in a ratio. Understand that the term multiplicative means that the quantities in a ratio are related by multiplication. Do Now: Develop Number Sense Tell Me All That You Can: Students make sense of quantities and their relationships in order to make statements about a picture. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of using a picture to analyze the relationship between soil samples and water samples on mSpace page 72. Step 1: Describe the Relationship. Step 2: Write the Ratio. Step 3: Write Another Ratio. Step 4: Describe the Second Ratio. Explore: Guide students to generate their own contexts for ratios.

		mSpace p. 72-73 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Understanding Ratios Solve the problem: A logging company plants 2 seedlings for every 5 trees it cuts down. If the logging company cuts down 20 trees, how many seedlings does it plant? If there are 20 trees, there are _____ seedlings. Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 73
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 72-73. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Understand that a ratio is a multiplicative comparison of two quantities. Language Goals: Understand and use the terms unit and unit ratio in complete sentences. Use the phrase "multiplicative comparison" when describing the relationship between quantities in a ratio. Do Now: Analyze Problems Missing Numbers: Students conceptualize a verbal description to solve a problem involving volunteering for a school recycling day. Mathematical Thinking: Persevere and Solve Problems Teach: Solve a Problem Together Guide students through the steps of using a bar model to explore the multiplicative relationship between the number of volunteers and the number of days to clean a local beach on mSpace page 74. Step 1: Interpret the Bar Model. Use the Vocabulary Routine to teach unit.

		Step 2: Model Another Situation. Step 3: Express as a Ratio. Use the Vocabulary Routine to teach unit ratio. High-Leverage Practice: Lead a Discussion Step 4: Find the Multiplicative Relationship. Explore: Have students apply the multiplicative relationship. mSpace pages 74-75.
	Checking for Understanding	Summarize and Assess: Review Modeling Unit Ratios Select all that apply: Students select all correct answers that relate to a family using 18 gallons of water in 3 days. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 75
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 74-75. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 2 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Identify and evaluate ratios using multiple visual representations. Language Goals: Use the term ratio to describe a comparison of two quantities. Use the phrase "a to b" to articulate a ratio a:b. Do Now: Develop Game Strategy Brain Arcade: Students use ratio reasoning in the game Fair Share. Have students discuss the different cuts they made and explain their reasoning. Mathematical Thinking: Model With Mathematics Teach: Ratio Bingo Students practice writing and identifying ratios. Step 1: Place sticky notes marked with a "S" (shaded) and "U" (unshaded) on two numbers.

		Step 2: Record the comparison and corresponding ratio. Step 3: Mark the square that shows the ratio. Step 4: Trade turns. Player B moves one sticky note and repeats Steps 2 and 3. The first person to mark four squares in a row wins. mSpace p. 76-79.
	Checking for Understanding	Summarize and Assess: Review Game Strategy Answer the question: It is Player X's turn. What move should Player X make next? Player X should move the _____ sticky note from _____ to _____ because _____. Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p. 79
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 76-79. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Represent and solve multiplicative comparison problems with ratios using models. Language Goals: Express the comparison of two quantities as their difference. Use the terms product, sum, and difference to describe the operation used in solving a problem. Do Now: Develop Flexible Thinking Brain Teaser: Students carefully analyze the relationships between the rates, times, and distances to solve the problem. Mathematical Thinking: Persevere and Solve Problems Teach: Solve a Problem Together Guide students through the steps of using a bar model to determine how many fewer solar panels Ron uses than Zoe on mSpace page 82.

		Read It! Read the problem. Show It! Represent the problem. Solve It! Solve the problem. Check It! Check your work. mSpace p. 82-83 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Ratio Problems Solve the problem: Rob, a marine biologist, observes a dolphin pod with a 6:4 male-to-female ratio. The pod has 18 males. How many more males than females are in the dolphin pod? There are _____ more male dolphins than female dolphins in the pod. Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p.83
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 82-83. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week for homework.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 3 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Represent and solve ratio problems. Language Goals: Use the term unit when referring to the equal-sized parts that make up a bar model. Use the term unknown to describe the quantity you need to find in a problem. Do Now: Evaluate Solutions Who's Right?: Students compare the effectiveness of two answers involving the ratio of park rangers to square miles in a nature reserve. Ask questions to have students identify the mistake and how to correct it. Mathematical Thinking: Construct Viable Arguments Teach:

		Solve a Problem Together Guide students through the steps of using a bar model to determine the number of recycling bins on mSpace page 84. Step 1: Model the Ratio. Step 2: Label the Bar. Use the Vocabulary Routine to teach unknown. Step 3: Find the Value of Each Unit. Step 4: Find the Other Amount. mSpace p. 84-85 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Modeling Ratios Solve the problem: Zach is a farm food scientist. To keep pigs healthy, he uses a whey-to-corn ratio of 5:8 to feed them. If Zach has 15 tons of whey, how many tons of corn does he have? Zach has _____ tons of corn. Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p.85
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 84-85. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 3 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Generate equivalent ratios using models. Language Goals: Use the phrase equivalent ratios when referring to quantities that have the same multiplicative relationship. Use the term multiplier when referring to the factors that are used to find equivalent ratios. Do Now: Develop Reasoning Skills

		Which Does Not Belong?: Students analyze a set of numbers to determine the pattern and then identify the pair of numbers that does not belong. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of using a bar model to determine the number of recycling bins on mSpace page 86. Step 1: Use a Bar Model to Represent the Ratio. Step 2: Find the Multiplier. Use the Vocabulary Routine to teach multiplier. Step 3: Find the Other Amount in the Ratio. Step 4: Express the Equivalent Ratio. Use the Vocabulary Routine to teach equivalent ratios. Use Think-Pair-Share to have students generate equivalent ratios. mSpace p. 86-87 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Equivalent Ratios Select all that apply: Students select all correct answers that relate to the ratio of girls to boys at a science fair. Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 87
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 86-87. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Use models to determine if two ratios are equivalent. Language Goals: Use the phrase "is equivalent" or "is not equivalent" to describe the relationship of any two ratios. Do Now: Create Structure

		Build It: Students use numbers to write two equivalent ratios. Have students share their answers and explain their methods. Mathematical Thinking: Attend to Precision Teach: Solve a Problem Together Guide students through the steps of using a bar model to compare the ratio of rain forest area to farm area on mSpace page 88. Step 1: Represent the First Ratio With a Bar Model. Step 2: Find the Multiplier. Step 3: Find an Equivalent Ratio. Grade-Level Content Connections: Ratios & Proportional Relationships Step 4: Determine if the Ratios Are Equivalent. mSpace p. 88-89 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Equivalent Ratios Solve the problem: A meteorologist finds that the ratio of rainy days to sunny days is 25. Last month there were 10 rainy days and 20 sunny days. Is last month's weather equivalent to the meteorologist's ratio? The meteorologist's ratio is/is not equivalent to last month's weather. Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 89
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 88-89. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Use ratio and rate reasoning to solve problems involving measurement. Language Goals: Identify "numerical patterns" and use patterns to describe mathematical rules. Use precise language to describe finding the area of a square. Do Now:

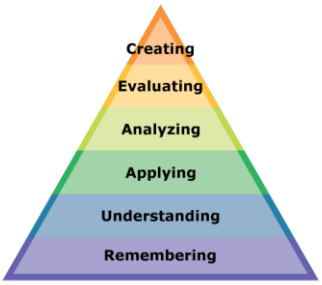
		Analyze Problems Missing Numbers: Students fill in the blanks to create equivalent ratios. Have students share their answers. Mathematical Thinking: Make Use of Structure Teach: Read a Multi-Step Problem Students evaluate two plans for expanding the area of a park habitat. Read It! Read the problem. Park Habitat Plans for Habitat Expansion Mathematical Thinking: Construct Viable Arguments Explore: Students determine if two plans can both be correct. Analyze It! Analyze the problem. Evaluate the Plans Grade-Level Content Connections: Geometry mSpace p. 90-91 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Using Ratios to Find Area Solve the problem: A science illustrator wants to enlarge a square drawing so that the area is 4 times greater. If the area of the enlarged drawing is 100 square inches, what was the side length of the original drawing? Explain. Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 91
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 90-91. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Block 2 Performance Task	
	Teach Teaching Options	Lesson Objective: Create Volunteer Teams Students apply rate and ratio reasoning to solve a multi-step problem. Teach: Replay Anchor Video – "One Man's Trash."

		Introduce Performance Task. Complete the Performance task mSpace p. 92-93. Evaluate: Students will be evaluated based on Performance Task Rubric Explore, Apply, and Analyze
	Practice and Apply Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	mSkills Curriculum Based Assessment 2	Review: To prepare students for mSkills: Download the Block 2 mSkills Strategy Lesson, Student Pages, and Annotated Student Pages to give students targeted practice with assessment item types based on current Block content. You may also teach the mSkills Demo Lesson to give students a general overview of assessment item types based on prerequisite content. Evaluate: To administer mSkills: Go to Class Settings and assign the mSkills assessment to students. Have students log in to the student software. Administer: Reference Guide. The first 20 items will be digitally graded and available in Class Analytics Zone Progress. Enter scores to the constructed-response items in the SDP using the Scoring Rubric. Have students complete the Mindset Strategy in their mSpaces to reflect on their performance in the Block.

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on teacher observations, students doing quality of work together, questioning strategies, self and peer assessment, student record-keeping, quizzes, essays, Quizzes, tests, homework, class discussion, individual conferences, journal writing, performance tasks, diagnostic tests, homework, and projects

Accommodations/Modifications:

- **Use manipulatives to build patterns or represent symbols.**
- **Provide Graphic organizers to use in solving problems.**
- **Provide guided notes/handouts. Break problems into smaller pieces.**
- **Have students keep and turn in a notebook.**
- **Review needed skills prior to the lesson.**
- **Provide checklists for solving problems.**
- **Provide students with a resource page that has multiplication charts, fractions pieces.**
- **Break problems and test sections into smaller pieces.**
- **Allow students extra time to complete projects.**
- **Provide students with an example of project for reference.**
- **Make a clear rubric for students to understand exactly what is expected.**

Summative Assessments:

Periodic chapter tests, state assessments, PSATs, End of Course tests, and SATs

Performance Assessments:

Projects, display of student work, and electronic portfolios

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title: Math Foundations I – Math 180 **Grade Level(s):** **10**	**Unit Summary:** **In this unit students develop an understanding of fraction equivalence.**
Essential Question(s): **COURSE II** **Concepts in Block 3** **Big Idea 1:** **How do rates, ratios, and percent represent relationships between quantities?** **Big Idea 2:** **How do we use equivalent fractions and how we can use number sense to find equivalent ratios?** **Topic 1: Representing Ratios** **Topic 2: Applications of Ratio Understanding** **Topic 3: Percent as a number**	Enduring Understanding(s): Students will be able to: • Construct a table of equivalent ratios. • Interpret ordered pairs as ratios. • Graph points in the first quadrant of the coordinate plane. • Represent and graph ratios in the coordinate plane. • Determine the total, given a ratio and a part. • Determine the value of a ratio a to b as a/b. • Determine the value of a ratio as a/a + b. • Apply the values of ratios to determine if the ratios are equivalent. • Apply the values of ratios to generate equivalent ratios. • Determine the difference given a ratio and a part. • Express a part per 100 as a fraction, decimal, and percent. • Express common fractions in percent form. • Express fractions in percent form, and relate fraction, decimal, and percent forms. • Understand the differences and similarities between different forms of ratios.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the NJSLS or Common Core Standards that are applicable

Learning Target	**NJSLS or CCSS:**
Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	7.RP.A.3-
Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.	6.NS.C.8-
Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.	7.RP.A.2a-
Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.	7.RP.A.1-

Inter-Disciplinary Connections:

Real-World problem solving examples: To solve problems related to fields of logistics, environmental science, sales and marketing, public services, Art and Design, entrepreneurship & business, entertainment, information technology and health science.

Students will engage with the following text:

Math 180, Scholastic, Inc. 2014

Students will write:

Writing/Open Ended questions: Students will explore how math is used in logistics, organizing, and planning.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Students will uncover and build skills through various classroom activities. Investigating number sense activities, modeling examples, using real-life application, using note-taking strategies, and using SMARTBoard technologies will all be explored. Other learning experiences could include alternative lesson openers, math and history applications, problem solving workshops, interdisciplinary applications and extra examples of problem solving.
Suggested warm-up activities, instructional strategies/activities, and assignments:

Block 3: Ratio Relationships	Essential Question: How do rates, ratios, and percent represent relationships between quantities?
Topic 1 (Lesson 1):	
FOCUS AND MOTIVATE	Do Now! Build Career Awareness Block Preview: Have students analyze the Career Explorations on mSpace page 95 to explore careers in sales and marketing. Introduce the Anchor Video "1 in 5" Guide students to make connections between sales and marketing and ratios.
Teach Teaching Options	Lesson Objective: Apply rate and ratio concepts to solve a multi-step problem. Language Goals: Understand and apply the difference between a "projection" and a "prediction."

		Teach: Read a Multi-Step Problem Students analyze a multi-step problem to evaluate two building plans. Read It! Read the problem. Mathematical Thinking: Persevere and Solve Problems Evaluate a Business Plan School Options Analyze It! Analyze the problem. Develop a Plan Grade-Level Content Connections: Ratios & Proportional Relationships. mSpace p. 98-99 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Using Ratios to Make Projections Solve the problem: A new day care center has a maximum capacity of 320 people. The staff-to-child ratio is 3:5. The number of children will grow by 20 each year. In how many years will the center reach full capacity? Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 99
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 98-99. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Construct a table of equivalent ratios. Language Goals: Understand and use the term equivalent ratios in complete sentences. Use the phrase "times as much" when describing multiplicative increase or decrease. Do Now: Evaluate Solutions

		Who's Right?: Students analyze two tables to identify which represents the same multiplicative relationship. Mathematical Thinking: Construct Viable Arguments Teach: Solve a Problem Together Guide students through the steps of using a bar model to find the ratio of large boxes to small boxes of e-readers on mSpace page 100. Step 1: Represent the ratio in the table. Step 2: Find an equivalent ratio. Step 3: Find another equivalent ratio. Step 4: Complete the table. mSpace p. 100-101 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Multiplying a Fraction by a Whole Number Exit Ticket: mSpace p. 101
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 100-101. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Interpret ordered pairs as ratios. Language Goals: Use the phrase "coordinates of point A" to express the horizontal and vertical distances from 0 to point A on a grid. Use the term ordered pair to name a point on a coordinate grid using two numbers. Do Now: Develop Flexible Thinking

		Brain Teaser: Students use a ratio of nickels to quarters to determine the total amount of money. Mathematical Thinking: Persevere and Solve Problems Teach: Solve a Problem Together Guide students through the steps of using a graph to determine the multiplicative relationship between TV ads and newspaper ads on mSpace page 102. Step 1: Label each point on the graph. Use the Vocabulary Routine to teach coordinates and ordered pair. Step 2: Complete the table. Step 3: Express each point as a ratio. Step 4: Find the multiplicative relationship. mSpace p. 102-103 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Interpreting Coordinates of Points Find and fix the error in the ratio representation. The number of running shoes is _____ times the number of basketball shoes. Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 103
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 102-103. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Graph points in the first quadrant of the coordinate plane. Language Goals: Use the phrase "plot a point" to describe the act of locating and labeling a point on the coordinate plane.

		Use the term ordered pair to describe the position of a point on a coordinate plane. Do Now: Create Structure Build It: Students analyze two ratios and create multiple equivalent ratios. Have students share their responses. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of graphing ratios as ordered pairs to represent the number of booths and servers at a restaurant on mSpace page 104. Step 1: Describe and plot point A. Use the Vocabulary Routine to teach plot. Step 2: Describe and plot point B. Step 3: Describe and plot point C. Grade-Level Content Connections: Ratios & Proportional Relationships Step 4: Plot an equivalent ratio. mSpace p. 104-105 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Plotting Points on a Graph Solve the problem: The table shows the number of positive and negative reviews a restaurant receives online. Graph these ratios as ordered pairs. Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 105
	Practice and Apply Assigning Homework	Play game in pairs on mSpace pages 104-105. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Topic 1 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Represent and graph ratios in the coordinate plane. Language Goals: Use the term ordered pair to name a point on a coordinate grid using two numbers. Understand that an ordered pair represents a point on a graph. Do Now: Develop Game Strategy

		Brain Arcade: Students select the fish with the number that makes the equation true in the game Sea Level. Mathematical Thinking: Reason Abstractly Teach: Teach Battle of the Ratios (Level 1) Students practice plotting ratios on a coordinate grid. Step 1: Player A chooses a ratio and records the ordered pair. Step 2: Player A plots the ratio. Step 3: Player B changes one of the values of Player A's ratio and plots the new point. Step 4: Trade turns. The next player records a ratio and plots it. The first player to plot four points in a row wins. mSpace p. 106-109 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Answer this question: You are player X, and the other player last plotted the ratio 56. What should your next ratio be to plot four points in a row? To plot four points in a row, my next ratio should be _____ because _____. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 109
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 106-109. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Determine the total, given a ratio and a part. Language Goals: Use the terms equivalent ratios, multiplier, and sales trend to explain a projection. Do Now:

		Develop Estimation Skills Make an Estimate: Students make sense of the relationship between two quantities and apply this logic to make a prediction. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of using ratios to determine the amount of shirts sold on mSpace page 112. Read It! Read the problem. Show It! Represent the problem. Explore: Have students discuss other ways to represent the problem. Solve It! Solve the problem. Check It! Check your work. High-Leverage Practice: Lead a Discussion mSpace p. 112-113 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Solving Problems With Rates and Ratios Select all that apply: Students select all correct answers that apply to a "buy 3 get 1 free" sale. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 113
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 112-113. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Determine the value of a ratio a to b as a/b. Language Goals: Use the term unit to describe each single, equal-sized part in a bar model. Use the terms, ratio, and unit when representing ratios and ratio relationships with bar models.

		Do Now: Develop Flexible Thinking Brain Teaser: Students solve a problem involving ratios of employees at a magazine. Have students share their reasoning. Mathematical Thinking: Persevere and Solve Problems Teach: Solve a Problem Together Guide students through the steps of using a bar model to express the number of print ads as a fraction of the online ads on mSpace page 114. Step 1: Model the ratio. Step 2: Find the value of each unit. Step 3: Find the size of the other bar. Step 4: Compare using the value of the ratio. mSpace p. 114-115 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Using Ratios to Compare Parts Solve the problem: A sales manager forecasts that 4 pairs of sneakers will be sold for every 6 pairs of ballet flats. Express the number of sneakers as a fraction of the ballet flats. The number of sneakers is _____ the number of ballet flats. Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 115
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 114-115. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Determine the value of a ratio as a/a + b. Language Goals:

		Use the term value to mean the fractional part of the whole for either part of a ratio. Use the phrase "part- whole" ratio when comparing a quantity that is part of a total to the total amount. Do Now: Create Structure Build It: Students build a table by listing the ratios of A : B in the correct columns. Have students share their answers and explain their reasoning. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of using a bar model to determine the number of free T-shirts given away on mSpace page 116. Step 1: Label each part on the bar model. Step 2: Express the ratio of the part to the whole. Step 3: Express the value of the ratio. Step 4: Solve the problem. Explore: Have students find the number of T-shirts that were bought. mSpace p. 116-117 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Part-Whole Ratios Solve the problem: The sandwich shop has a loyalty card: for every 6 sandwiches you buy, you get 1 free. If Ana needed a total of 63 sandwiches for a customer event, how many did she get for free? Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 117
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 116-117. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 4):	

	Teach Teaching Options	Lesson Objective: Apply the values of ratios to determine if the ratios are equivalent. Language Goals: Use the term simplest form to describe a fraction in which the numerator and denominator share only 1 as a common factor. Do Now: Develop Number Sense Tell Me All That You Can: Students describe a bar model representing cars sold at a dealership. Have students share their solutions. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of determining on which website a video is more popular on mSpace page 118. Step 1: Interpret the first ratio. Step 2: Find the value of the first ratio. Use the Vocabulary Routine to teach simplest form. Step 3: Interpret the second ratio. Grade-Level Content Connections: Ratios & Proportional Relationships Step 4: Determine if the ratios are equivalent. mSpace p. 118-119 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Evaluating Ratios Solve the problem: A store wants to promote a new product and is offering two deals to encourage people to buy more. Which is a better deal? Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p.119
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 118-119. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.

	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Apply the values of ratios to generate equivalent ratios. Language Goals: Use the term ordered pair to name a point on a coordinate grid using two numbers. Explain the relationship between equivalent ratios and ordered pairs. Do Now: Develop Game Strategy Brain Arcade: Students represent the equation 1/2+ 1/6+ 1/3= 1 by drawing cuts on the board in the game Fair Share. Mathematical Thinking: Reason Abstractly Teach: Battle of the Ratios (Level 2) Students practice plotting equivalent ratios on a coordinate grid. Step 1: Plot a point, record the ordered pair and ratio. Step 2: Player B chooses one of the two actions: Record an equivalent ratio and plot the point. Change one of the values of the ordered pair and plot a new point. Step 3: Players trade turns and plot their next ratios. The first player to connect the points of four equivalent ratios wins. mSpace p. 120-123 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Answer this question: Your opponent plots the point (11, 2). Is it possible to win the game by creating equivalent ratios? What would be your next move? Explain. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p.123
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 120-123. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings.

		Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 3 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Determine the difference given a ratio and a part. Language Goals: Understand and use the terms "revenue," "cost," and difference to discuss "profit." Do Now: Develop Flexible Thinking Brain Teaser: Students solve a riddle involving the difference between Ed's age and Tim's age. Ask students to share their solutions. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of determining Lamar's profit per cake on mSpace page 126. Read It! Read the problem. Show It! Represent the problem. Solve It! Solve the problem. Check It! Check your work. Mathematical Thinking: Attend to Precision mSpace p. 126-127 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Ratio Problems Select all that apply: Students select all the correct answers that relate to a summer camp's cost-to-revenue ratio. Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 127
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 126-127. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.

	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Express a part per 100 as a fraction, decimal, and percent. Language Goals: Understand and use the term percent to mean per 100 or out of 100. Describe a decimal grid as one whole divided into 100 equal parts. Do Now: Develop Flexible Thinking Who's Right?: Students analyze three different answers to the same problem to identify an error, and then justify their conclusions. Mathematical Thinking: Construct Viable Arguments Teach: Solve a Problem Together Guide students through the steps of using a decimal grid to determine the portion of phones a company received on mSpace page 128. Step 1: Express as a fraction. Step 2: Express the fraction as a rate. High-Leverage Practice: Lead a Discussion Step 3: Express the rate as a percent. Use the Vocabulary Routine to teach percent. Step 4: Express the percent as a decimal. Explore: Help students deepen their understanding by extending the problem. mSpace p. 128-129 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Express Parts per Hundred Solve the problem: An e-commerce planner gets 100 hits on a web survey. The decimal grid represents the number of completed surveys. What portion of the surveys are completed? Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 129
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 128-129. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone

		Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Express common fractions in percent form. Language Goals: Understand that an equivalent fraction, decimal, and percent all share the same location on a number line. Do Now: Identify Numerical Patterns Find the Pattern: Students write a quantity in the circle using the rule. Ask students to share their solutions. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of using a double number line to determine what percent of a magazine's advertising space is sold to clothing companies on mSpace page 130. Step 1: Plot the fraction on the number line. Step 2: Write an equivalent fraction with a denominator of 100. Step 3: Express the fraction as a decimal. High-Leverage Practice: Elicit Student Thinking Step 4: Express the decimal as a percent. MSpace p. 130-131 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Expressing a Fraction as a Percent Solve the problem: The grid shows how much time social media users spend on their favorite websites every day. What percent of the day do social media users spend on their favorite websites? Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 131
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 130-131. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone

		Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Express fractions in percent form, and relate fraction, decimal, and percent forms. Language Goals: Understand that the term "of" indicates multiplication. Expressa fraction a/b as a ÷ b. Do Now: Develop Flexible Thinking Brain Teaser: Students develop number sense with a conceptual understanding of fractions by solving a riddle. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of using a double number line to determine what percent of employees attend a meeting on mSpace page 132. Step 1: Plot the fraction on the number line. Step 2: Divide to express the fraction as a decimal. Step 3: Multiply by 100, and then divide by 100. Explore: Have students explore inverse operations by multiplying and dividing by the same number. Step 4: Express as a percent. mSpace pages 132-133.
	Checking for Understanding	Summarize and Assess: Review Renaming a Fraction as a Percent Solve the problem: Out of 16 people in a marketing department, 13 work remotely. What percent of the people in the marketing department work remotely? Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 133.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 132-133. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software:

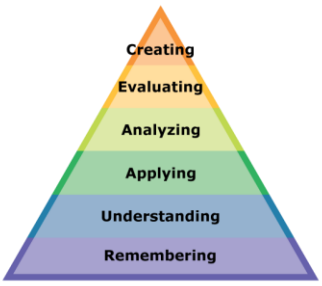
		Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Understand the differences and similarities between different forms of ratios. Language Goals: Use different forms of ratios to describe relationships between quantities. Do Now: Develop Reasoning Skills Which Does Not Belong?: Students circle the representation that does not belong. Ask students to share their reasoning. Mathematical Thinking: Make Use of Structure Teach: Read a Multi-Step Problem Students analyze a multi-step problem to plan a marketing campaign featuring a new mobile phone app. Read It! Read the problem. Develop a Marketing Campaign Explore: Guide students to explore what it means mathematically to be popular. Customer Survey Results Analyze It! Analyze the problem. Evaluate the Plans Mathematical Thinking: Persevere and Solve Problems Grade-Level Content Connections: Ratios & Proportional Relationships mSpace pages 134-135.
	Checking for Understanding	Summarize and Assess: Review Representing Ratios Solve the problem: A survey finds that the ratio of teenagers who shop online to those who don't is 7:3. 7/10 of adults shop online. Compare the percent of teenagers to the percent of adults who shop online. Mathematical Thinking: Use Repeated Reasoning

		Exit Ticket: mSpace p. 135.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 135-135. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Block 3 Performance Task	
	Teach Teaching Options	Lesson Objective: Generate Profits With Ratios Students apply ratio reasoning to solve a multi-step problem involving ratios. Teach: Replay Anchor Video – "1 in 5." Introduce Performance Task. Complete the Performance task mSpace p. 136-137. Evaluate: Students will be evaluated based on Performance Task Rubric Explore, Apply, and Analyze
	Practice and Apply Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	mSkills Curriculum Based Assessment 3	Review:

		To prepare students for mSkills: Download the Block 3 mSkills Strategy Lesson, Student Pages, and Annotated Student Pages to give students targeted practice with assessment item types based on current Block content. You may also teach the mSkills Demo Lesson to give students a general overview of assessment item types based on prerequisite content. Evaluate: To administer mSkills: Go to Class Settings and assign the mSkills assessment to students. Have students log in to the student software. Administer: Reference Guide. The first 20 items will be digitally graded and available in Class Analytics Zone Progress. Enter scores to the constructed-response items in the SDP using the Scoring Rubric. Have students complete the Mindset Strategy in their mSpaces to reflect on their performance in the Block.

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.
IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on teacher observations, students doing quality of work together, questioning strategies, self and peer assessment, student record-keeping, quizzes, essays, Quizzes, tests, homework, class discussion, individual conferences, journal writing, performance tasks, diagnostic tests, homework, and projects

Accommodations/Modifications:

- **Use manipulatives to build patterns or represent symbols.**
- **Provide Graphic organizers to use in solving problems.**
- **Provide guided notes/handouts. Break problems into smaller pieces.**
- **Have students keep and turn in a notebook.**
- **Review needed skills prior to the lesson.**
- **Provide checklists for solving problems.**
- **Provide students with a resource page that has multiplication charts, fractions pieces.**
- **Break problems and test sections into smaller pieces.**
- **Allow students extra time to complete projects.**
- **Provide students with an example of project for reference.**
- **Make a clear rubric for students to understand exactly what is expected.**

Summative Assessments:

Periodic chapter tests, state assessments, PSATs, End of Course tests, and SATs

Performance Assessments:

Projects, display of student work, and electronic portfolios

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title: Math Foundations I – Math 180	**Unit Summary:** **In this unit students develop an understanding Percent and Proportional Reasoning.**
Grade Level(s): **10**	

Essential Question(s): **COURSE II** **Concepts in Block 4** **Big Idea 1:** **How does value of a rate or percent vary greatly over different quantities?** **Big Idea 2:** **How numbers in percent form help us compare quantities and groups of different sizes?** **Topic 1: Percent Concepts** **Topic 2: Comparing with Percent** **Topic 3: Relationships in Ratio Tables** **Performance Task: Plan a Career Education Program** **Mindset Strategy: Reflect on Seeking Challenges**	**Enduring Understanding(s):** Students will be able to: • Use percent to create a visual model and construct an argument. • Determine the percent given the part and the whole in a percent problem. • Determine the part of a whole when given a percent. • Use models to determine the part or the whole in percent problems. • Use reasoning to decrease a number by a given percent. • Use percent to compare relative sizes of parts of different groups. • Use reasoning to increase and decrease a number by a given percent. • Represent and solve percent problems by determining percent increase or decrease. • Identify the multiplicative relationship between related quantities in a ratio table. • Generate equations to represent proportional relationships. • Use a rate to construct a ratio table and graph a proportional relationship. • Use the phrase "average rate" to describe rates based on data that may vary, but are useful when making predictions. • Apply rate and percent concepts to represent and solve multi-step problems.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the NJSLS or Common Core Standards that are applicable

Learning Target	**NJSLS or CCSS:**
Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	7.RP.A.3-
Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.	8.SP.A.1-
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	8.EE.C.7b-
Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.	8.EE.B.5-

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills.

Students will uncover and build skills through various classroom activities. Investigating number sense activities, modeling examples, using real-life application, using note-taking strategies, and using SMARTBoard technologies will all be explored. Other learning experiences could include alternative lesson openers, math and history applications, problem solving workshops, interdisciplinary applications and extra examples of problem solving.
Suggested warm-up activities, instructional strategies/activities, and assignments:

Block 4: Percent and Proportional Reasoning p. 138-181B	Essential Question: How does value of a rate or percent vary greatly over different quantities? How numbers in percent form help us compare quantities and groups of different sizes?
Topic 1 (Lesson 1):	
FOCUS AND MOTIVATE	Do Now! Build Career Awareness Block Preview: Have students analyze the Career Explorations on mSpace page 139 to explore careers in the field of public service. Introduce the Anchor Video "Urban Action" Guide students to make connections between public service, percent, and proportional reasoning.
Teach Teaching Options	Lesson Objective: Use percent to create a visual model and construct an argument. Language Goals: Understand and use data and percent to construct a viable argument. Teach: Read a Multi-Step Problem

		Students analyze a multi-step problem to decide if moving recess will benefit a school district. Read It! Read the Problem. Mathematical Thinking: Construct Viable Arguments Policy Change Plate Waste Research Data Use Think-Pair-Share to have students discuss the data. Analyze It! Analyze the Problem. Develop a Plan Grade-Level Content Connections: Ratios & Proportional Relationships mSpace p. 139-140 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Comparing Routes Answer the question: Homes produce 30% of overall food waste. Grocery stores produce 13% of overall food waste. Which would have a more significant impact: a plan to reduce food waste in homes or in grocery stores? Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 140
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 139-140. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Determine the percent given the part and the whole in a percent problem. Language Goals: Understand that finding half of a number is the same as finding 50% of that number. Do Now: Develop Number Sense Tell Me All That You Can: Students reason about the quantitative relationships of the fraction 5/10. Mathematical Thinking: Reason Abstractly

		Teach: Solve a Problem Together Guide students through the steps of using a double number line to determine what percent of people accepted an invitation to a fundraising event on mSpace page 144. Step 1: Model the problem. Step 2: Estimate the percent. Step 3: Divide the part by the whole. Step 4: Express the decimal as a percent. mSpace p. 144-145 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Finding the Percent Solve the problem: A town has 4000 residents. 1600 of the residents arrived in the past year. What percent of the residents arrived in the past year? Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 145
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 144-145. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Determine the part of a whole when given a percent. Language Goals: Understand benchmark to mean the percent used to help make an estimate. Do Now: Develop Reasoning Skills Which Does Not Belong?: Students make sense of quantities and think about the relationship between a fraction, a decimal, and a percent. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together

		Guide students through the steps of using a double number line to determine how many students a community educator teaches on mSpace page 146. Step 1: Model the problem. Use the Vocabulary Routine to teach benchmark. Step 2: Make an estimate. High-Leverage Practice: Lead a Discussion Step 3: Find 1% of the whole. Step 4: Solve the problem. mSpace p. 146-147 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Finding the Part Solve the problem: Paco, the class president, surveys 280 students about the prices in the school cafeteria. 70% of the students want lower prices. How many students want lower prices? Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 147
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 146-157. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Determine the part of a whole when given a percent. Language Goals: Use the terms part, percent, and whole to explain game strategy and moves. Do Now: Develop Game Strategy Brain Arcade: Students circle the flower that should be placed inside the flowerpot labeled 50 in the game Ten Garden. Mathematical Thinking: Use Repeated Reasoning Teach: Teach

		Percent Takeover (Level 1) Students practice finding the part of a whole when choosing the percent. Step 1: Choose a neighborhood in a district. Step 2: Choose a percent. Step 3: Find the percent of the people who voted for you. Step 4: Record the total votes won. Trade turns. The player with the most votes after 8 turns wins. mSpace p. 148-151 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Answer this question: Without doing any written calculations, what is 50% of 120? What is 25% of 120? 50% of 120 is _____.25% of 120 is _____. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 151
	Practice and Apply Assigning Homework	Play game in pairs on mSpace pages 148-151. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Topic 1 (Lesson 5):	
	FOCUS AND MOTIVATE	Do Now! Analyze Problems Missing Numbers: Students write the quantities in the missing spaces on the number line. Mathematical Thinking: Reason Abstractly
	Teach Teaching Options	Lesson Objective: Use models to determine the part or the whole in percent problems. Language Goals: Understand that the whole is represented by the top value on a double number line and is aligned with 100%. Teach: Solve a Problem Together Guide students through the steps of using a double number line to determine the number of police officers on mSpace page 152. Step 1: Model the problem. Step 2: Make an estimate. Step 3: Find 1% of the whole. Grade-Level Content Connections: Ratios & Proportional Relationships Step 4: Solve the problem. mSpace p. 152-153 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Solving Percent Problems Find and fix the errors using the double number line: Lora, a campaign manager, distributes flyers to 35% of the homes in her community. Lora distributes flyers to 630 homes. How many homes are in her community? Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p. 153
	Practice and Apply	Solve problems in pairs on mSpace pages 152-153.

	Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Apply finding a part and whole to compare groups of different sizes. Language Goals: Identify and reason about parts, wholes, and percent when comparing quantities. Do Now: Analyze Problems Missing Numbers: Students analyze the given information in a problem to complete equations on percent. Mathematical Thinking: Persevere and Solve Problems Teach: Solve a Problem Together Guide students through the steps of using a double number line to determine how many people were surveyed on mSpace page 156. Read It! Read the problem. Show It! Represent the problem. Solve It! Solve the problem. Explore: Ask students to explore the relationship between numbers in percent form and parts. Check It! Check your work. mSpace p. 155-157 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Percent Problems Solve the problem: Ani teaches 25% of the 4-year-olds at her school. There are 60 4-year-olds. Ani also teaches 20 3-year-olds. How many students does Ani teach altogether? Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 157
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 156-157. Computer Software:

		On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Use reasoning to decrease a number by a given percent. Language Goals: Use the phrase "percent decrease" when reducing a whole by a percent of the whole. Do Now: Evaluate Solutions Who's Right?: Students analyze two responses to a problem and construct an argument about which is correct. Mathematical Thinking: Construct Viable Arguments Teach: Solve a Problem Together Guide students through the steps of using a double number line to determine the number of selfies posted on mSpace page 158. Step 1: Model the problem. Step 2: Estimate the final amount. Step 3: Express the percent as a decimal. High-Leverage Practice: Elicit Student Thinking Step 4: Find the final amount. mSpace p. 158-159 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Finding Percent Decrease Solve the problem: 320 people joined the state's police force last year. 30% fewer people joined this year. How many people joined the state's police force this year? Mathematical Thinking: Persevere and Solve Problems

		Exit Ticket: mSpace p. 159
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages p. 158-159. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Solve percent problems involving percent increase or percent decrease. Language Goals: Use the phrases "percent increase" or "percent decrease" when a whole amount is changed by a percent of the whole. Do Now: Create Structure Build It: Students express answers through accurate placements of digits in a multiplication equation. Mathematical Thinking: Attend to Precision Teach: Solve a Problem Together Guide the students through the steps of using a double number line to determine the number of people participating in a charity walk on mSpace page 160. Step 1: Model the problem. Step 2: Estimate the final amount. Step 3: Express the percent as a decimal. High-Leverage Practice: Modify Tasks Step 4: Find the final amount. mSpace p. 160-161 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Finding Percent Change

		Solve the problem: The Jones family spent $125 in May on their electricity bill. In June, the bill increased by 12% because they used the air conditioner more often. What was their electricity bill in June? Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 161
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 160-161. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Use percent to compare relative sizes of parts of different groups. Language Goals: Understand that percent is often used to compare fractional parts of wholes when it is not easy to determine which fraction is greater than or less than another. Do Now: Develop Flexible Thinking Brain Teaser**:** Students solve a riddle to determine how many female students are in the sixth and seventh grades altogether. Mathematical Thinking: Persevere and Solve Problems Teach: Solve a Problem Together Model the steps of using a table to determine which year had a greater percent of graduates who majored in political science on mSpace page 162. Step 1: Find the decimal value of the first ratio. Step 2: Find the decimal value of the other ratio. High-Leverage Practice: Elicit Student Thinking Step 3: Rewrite each decimal as a percent. Step 4: Compare the groups.

		Mathematical Thinking: Reason Abstractly mSpace p. 162-163 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Evaluating Ratios Solve the problem: A store wants to promote a new product and is offering two deals to encourage people to buy more. Which is a better deal? Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p.163
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 162-163 Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Use reasoning to increase and decrease a number by a given percent. Language Goals: Use the terms part, percent, and whole to explain game strategy. Do Now: Develop Game Strategy Brain Arcade: Students draw a chain of 3 slices of toast in order from least to greatest in the game You're Toast. Mathematical Thinking: Reason Abstractly Teach: Percent Takeover (Level 2) Students practice choosing a percent to find the part. Step 1: Choose two neighborhoods in a district. Step 2: Select a percent. Step 3: Find the number of votes won in the combined neighborhoods.

		Step 4: Trade turns. The player with the greater number of votes wins the district. The player with the most districts after 8 turns is the winner. mSpace p. 164-167 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Solve the problem:10% of 400 is _____. What is 90% of 400? 90% of 400 is _____. Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p.167
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 164-167. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 3 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Represent and solve percent problems by determining percent increase or decrease. Language Goals: Describe a percent increase or decrease as a percent of the original value. Do Now: Develop Estimation Skills Make an Estimate: Students estimate the size of each section of a circle as a percent. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of determining the percent change in the ticket price for a political dinner on mSpace page 170.

		Read It! Read the problem. Show It! Represent the problem. Solve It! Solve the problem. Check It! Check your work. mSpace p. 170-171 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Finding Change in Percent Select all that apply: Students select all correct answers that relate to the percent of people speeding. Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 171
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 170-171. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Identify the multiplicative relationship between related quantities in a ratio table. Language Goals: Understand the concept of a multiplicative relationship when comparing two quantities using multiplication. Describe a proportional relationship and ways to represent it. Use the term constant of proportionality when writing equations in the form of $y = kx$. Do Now: Develop Reasoning Skills Which Does Not Belong?: Students make conjectures about which equation does not belong, and justify their conclusions. Have students identify the value of n in the equations. Mathematical Thinking: Construct Viable Arguments

		Teach: Solve a Problem Together Guide students to find a ratio relationship in the table to determine the number of gallons of water 12 people need on mSpace page 172. Step 1: Describe the multiplicative relationship. Step 2: Verify the relationship. Step 3: Solve the problem. Grade-Level Content Connections: Expressions & Equations mSpace p. 172-173 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Identifying Relationships in Ratio Tables Solve the problem: The table shows the ratio of fire trucks to firefighters. How many firefighters are needed for 25 fire trucks? How do you know if the ratios in a ratio table are equivalent? Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 173
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 172-173. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Generate equations to represent proportional relationships. Language Goals: Use the term variable to describe a letter that represents an unknown quantity in a problem or equation. Understand and use a dot to represent multiplication. Do Now: Analyze Problems Missing Numbers: Students accurately use a set of numbers to calculate equations that meet a given criterion. Mathematical Thinking: Attend to Precision

		Teach: Solve a Problem Together Guide students to write an equation representing the relationship between the area of the parking lot and the number of spaces on mSpace page 174. Step 1: Use the graph to complete the table. Step 2: Describe the multiplicative relationship. Step 3: Interpret the relationship. Step 4: Write an equation to represent the relationship. Use the Vocabulary Routine to teach variable. mSpace p. 174-175 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Modeling a Relationship With an Equation Solve the problem: A program coordinator graphed the number of tickets a Phone-a-thon sold for a charity event. Express the relationship with an equation. The goal is to sell 600 tickets. The Phone-a-thon will last 7 hours. Will the goal be met? Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 175
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 174-175. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Apply rate and percent concepts to represent and solve multi-step problems. Language Goals: Use origin to name the point (0, 0) in the coordinate plane. Do Now: Develop Flexible Thinking Brain Teaser: Students deepen their understanding of multiplicative relationships by choosing criteria to create a riddle. Mathematical Thinking: Persevere and Solve Problems

		Teach: Solve a Problem Together Guide students to represent the related quantities of the number of airings and cost on mSpace page 174. Step 1: Use the rate to complete the table. Step 2: Use the table to find the ordered pairs. Step 3: Plot the points. Use the Vocabulary Routine to teach origin. Step 4: Interpret a point. mSpace pages 174-175. Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Representing Quantities on a Graph Solve the problem: Every post that is promoted on social media costs an organization $15. Create a graph that represents the relationship between the number of postings and the cost. Mathematical Thinking: Use Tools Strategically Exit Ticket: mSpace p. 175.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 174-175. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Apply rate and percent concepts to represent and solve multi-step problems. Language Goals: Use the phrase "average rate" to describe rates based on data that may vary, but are useful when making predictions. Do Now: Evaluate Solutions Who's Right?: Students analyze two responses to a problem and reason about which is correct. Ask students to share their solutions and explain their reasoning.

		Mathematical Thinking: Construct Viable Arguments Teach: Read a Multi-Step Problem Students analyze a multi-step problem to predict the day which the 500th visitor comes to the park. Read It! Read the Problem. 500th Visitor Celebration Mathematical Thinking: Persevere and Solve Problems Explore: Have students discuss why rates in real life lead to predictions that may or may not be accurate. Park Attendance Data Analyze It! Analyze the Problem Plan a Celebration Day Grade-Level Content Connections: Ratio & Proportional Relationships mSpace pages 178-179. Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Representing Ratios Solve the problem: A survey finds that the ratio of teenagers who shop online to those who don't is 7:3. 7/10of adults shop online. Compare the percent of teenagers to the percent of adults who shop online. Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 179.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 178-179. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Block 4 Performance Task	
	Teach Teaching Options	Lesson Objective: Plan a Career Education Program Students reason about percent to plan a career education program. Teach: Replay Anchor Video – "Urban Action." Introduce Performance Task.

		Complete the Performance task mSpace p. 180-181. Evaluate: Students will be evaluated based on Performance Task Rubric Explore, Apply, and Analyze
	Practice and Apply Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	mSkills Curriculum Based Assessment 4	Review: To prepare students for mSkills: Download the Block 4 mSkills Strategy Lesson, Student Pages, and Annotated Student Pages to give students targeted practice with assessment item types based on current Block content. You may also teach the mSkills Demo Lesson to give students a general overview of assessment item types based on prerequisite content. Evaluate: To administer mSkills: Go to Class Settings and assign the mSkills assessment to students. Have students log in to the student software. Administer: Reference Guide. The first 20 items will be digitally graded and available in Class Analytics Zone Progress. Enter scores to the constructed-response items in the SDP using the Scoring Rubric. Have students complete the Mindset Strategy in their mSpaces to reflect on their performance in the Block.

Inter-Disciplinary Connections:

Real-World problem solving examples: To solve problems related to fields of logistics, environmental science, sales and marketing, public services, Art and Design, entrepreneurship & business, entertainment, information technology and health science.

Students will engage with the following text:

Math 180, Scholastic, Inc. 2014

Students will write:

Writing/Open Ended questions: Students will explore how math is used in logistics, organizing, and planning.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

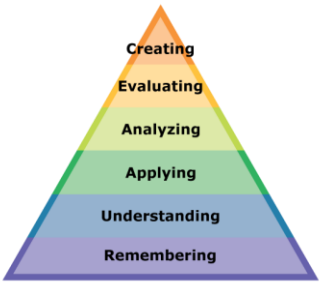
DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on teacher observations, students doing quality of work together, questioning strategies, self and peer assessment, student record-keeping, quizzes, essays, Quizzes, tests, homework, class discussion, individual conferences, journal writing, performance tasks, diagnostic tests, homework, and projects

Accommodations/Modifications:

- Use manipulatives to build patterns or represent symbols.
- Provide Graphic organizers to use in solving problems.
- Provide guided notes/handouts. Break problems into smaller pieces.
- Have students keep and turn in a notebook.
- Review needed skills prior to the lesson.
- Provide checklists for solving problems.
- Provide students with a resource page that has multiplication charts, fractions pieces.
- Break problems and test sections into smaller pieces.
- Allow students extra time to complete projects.
- Provide students with an example of project for reference.
- Make a clear rubric for students to understand exactly what is expected.

Summative Assessments:

Periodic chapter tests, state assessments, PSATs, End of Course tests, and SATs

Performance Assessments:

Projects, display of student work, and electronic portfolios

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title: Math Foundations II – Math 180 **Grade Level(s):** **10**	**Unit Summary:** **In this unit students develop an understanding of proportional relationships.**
Essential Question(s): **COURSE II** **Concepts in Block 5** **Big Idea 1:** **How can we represent proportional relationships with tables, graphs, and equations?** **Big Idea 2:** **How does modeling a situation with an equation help us to find a solution for any value?** **Topic 1: Representing Proportional Relationships** **Topic 2: Solution Sets** **Topic 3: Applications of Percent**	**Enduring Understanding(s):** Students will be able to: • Use visual scale models and ratios to solve problems involving measurement. • Represent and solve proportional relationships with equations. • Interpret unit rates from graphs of proportional relationships, and represent these relationships with equations. • Interpret unit rate as the constant of proportionality in the equation y = kx. • Generate solutions to equations that represent proportional relationships. • Graph right triangles and compare ratios to determine similarity. • Interpret points on a graph as solutions to an equation. • Generate solutions to a given equation by substituting values for x. • Generate solutions to equations that represent proportional relationships. • Reason about a solution to an equation. • Solve problems by representing proportional relationships with equations. • Write and solve equations that represent proportional relationships. • Determine the part using equations in which the constant of proportionality is a percent. • Solve percent problems using equations in which the constant of proportionality is a percent.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the NJSLS or Common Core Standards that are applicable

Learning Target	**NJSLS or CCSS:**
Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	8.G.A.3-
Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.	8.EE.B.5-
Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.	8.G.A.4-
Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).	8.EE.C.7a-
Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?	7.EE.B.4a-
Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.	7.RP.A.3-

Inter-Disciplinary Connections:

Real-World problem solving examples: To solve problems related to fields of logistics, environmental science, sales and marketing, public services, Art and Design, entrepreneurship & business, entertainment, information technology and health science.

Students will engage with the following text:

Math 180, Scholastic, Inc. 2014

Students will write:

Writing/Open Ended questions: Students will explore how math is used in logistics, organizing, and planning.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Students will uncover and build skills through various classroom activities. Investigating number sense activities, modeling examples, using real-life application, using note-taking strategies, and using SMARTBoard technologies will all be explored. Other learning experiences could include alternative lesson openers, math and history applications, problem solving workshops, interdisciplinary applications and extra examples of problem solving.
Suggested warm-up activities, instructional strategies/activities, and assignments:

VOLUME 2 BOOK Block 5: Representing Proportional Relationships	Essential Question: How can we represent proportional relationships with tables, graphs, and equations? How does modeling a situation with an equation help us to find a solution for any value?
Topic 1 (Lesson 1):	
FOCUS AND MOTIVATE	Do Now! Build Career Awareness Block Preview: Have students analyze the Career Explorations on mSpace page 3 to explore careers in the field of design
Teach Teaching Options	Lesson Objective: Use visual scale models and ratios to solve problems involving measurement. Language Goals: Understand and use the terms "scale" and "dimensions" in context. Teach: Read a Multi-Step Problem Students analyze a multi-step problem to create a blueprint for a park. Read It! Read the Problem. Design a Park Original Drawing Analyze It! Analyze the Problem. Modify the Drawing

		Grade-Level Content Connections: Geometry mSpace p. 4-5 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Designing a Scale Model Select all that apply: Students select all correct answers that relate to the scale drawing. Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 5
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 4-5. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Represent and solve proportional relationships with equations. Language Goals: Identify a proportional relationship as one in which two sets of numbers are related by a constant factor. Read a • b as " a times b." Do Now: Analyze Problems Missing Numbers: Students look closely to discern a pattern related to rates and use reasoning to find the missing numbers. Have students share responses and think about other ways to describe the pattern. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of representing a proportional relationship to solve a problem on mSpace page 8. Step 1: Use the graph to complete the table. Use the Vocabulary Routine to teach collinear points. Step 2: Describe the multiplicative relationship.

		Step 3: Write an equation to represent the relationship. Use the Vocabulary Routine to teach proportional relationship. Step 4: Solve the problem. High-Leverage Practice: Lead a Discussion mSpace p. 8-9 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Representing Proportional Relationships Solve the problem: Use the table to answer the question. What length of film does April need for 11 minutes of her movie? April needs _____ centimeters of film for 11 minutes of her movie. Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 9
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 8-9 Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Interpret unit rates from graphs of proportional relationships, and represent these relationships with equations. Language Goals: Explain that proportional relationships can be expressed with an equation, $y = kx$, where k is the same multiplicative factor for every x, y pair. Do Now: Evaluate Solutions Who's Right?: Students interpret a graph and use their solution to a problem to construct an argument. Have students share their solutions and explain Troy's error. Mathematical Thinking: Construct Viable Arguments Teach: Solve a Problem Together

		Guide students to estimate and solve a problem using a graph of a proportional relationship to determine how much money Jose earns in 5.25 hours on mSpace page 10. Step 1: Make an estimate. Step 2: Find the unit rate. Step 3: Express the proportional relationship with an equation. Step 4: Solve the problem. mSpace p. 10-11 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Interpreting Proportional Relationships Solve the problem: Rachel, a graphic designer, styles letters for a magazine. The graph shows the time it takes her to style letters. How many letters does Rachel style in 4.5 minutes? Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 11
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 10-11. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Interpret unit rate as the constant of proportionality in the equation $y = kx$ Language Goals: Identify the constant factor or multiplier between any x and y in a proportional relationship as the constant of proportionality. Explain that the unit rate is the constant of proportionality. Do Now: Develop Flexible Thinking Brain Teaser: Students analyze relationships between quantities, and explain the solution using clear definitions to determine who traveled the farthest? Mathematical Thinking: Attend to Precision

		Teach: Solve a Problem Together Guide students through the steps of interpreting the constant of proportionality to find the cost of 17.5 ounces of paint on mSpace page 8. Step 1: Make an estimate. Step 2: Find the constant of proportionality, k. Use the Vocabulary Routine to teach constant of proportionality. Step 3: Express the proportional relationship with an equation. Step 4: Solve the problem. mSpace p. 8-9 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Interpreting Constant of Proportionality Solve the problem: David paints a set for a play. The table shows the proportional relationship between gallons of paint and the area of the set. What area of the set can 11 gallons of paint cover? Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 9
	Practice and Apply Assigning Homework	Practice in pairs on mSpace pages 8-9 Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week for homework. Related HW assignments will be given using Kuta Software.
	Topic 1 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Generate solutions to equations that represent proportional relationships. Language Goals: Understand that proportional relationships can be expressed with an equation, $y = kx$. Do Now: Develop Game Strategy Brain Arcade: Students apply their knowledge of factors and multiples to solve multiplication equations with one or two unknowns. Have several students share their answers. Mathematical Thinking: Make Use of Structure Teach What's My Point? (Level 1) Students practice determining which ordered pairs are in a proportional relationship. Step 1: Spin the spinner for two values: one blue, one yellow. Step 2: Choose which value will be the x- and the k-value. Step 3: Substitute the values into the equation. Step 4: Find the y-value, and plot the point. Mark off and claim the point if it is already plotted.

		The player that claims the most plotted points is the winner. mSpace p. 10-19 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Solve the problem: Circle the player who found the correct multiplier for the ordered pair (3, 12). Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p. 19
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 10-19. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Graph right triangles and compare ratios to determine similarity. Language Goals: Use the term similar when comparing right triangles for similarity. Do Now: Analyze Problems Missing Numbers: Students analyze a graph and use the given information to solve a multi-step problem about how many avocados Asim purchased. Have students share responses and think about other ways to solve the problem. Mathematical Thinking: Persevere and Solve Problems Teach: Solve a Problem Together Guide students to determine if Luisa's triangles are similar using a graph on mSpace page 20. Read It! Read the problem. Show It! Represent the problem. Solve It! Solve the problem. Use the Vocabulary Routine to teach similar. Check It! Check your work. mSpace p. 20-21 Guided Practice: Demonstrate, Solve Together

		Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Select all that apply: Students select all correct answers that relate to the similar triangles. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 21
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 20-21 Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Interpret points on a graph as solutions to an equation. Language Goals: Use the phrase "satisfy the equation" to mean that when a value is substituted into an equation, it makes the equation true. Do Now: Create Structure Build It: Students make sense of the given quantities and their relationships when building equations with the same proportional relationship. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students to determine whether points on a graph represent solutions to the equation of the graph on mSpace page 22. Step 1: Determine if point A represents a solution. Use the Vocabulary Routine to teach solution. Step 2: Determine if point B represents a solution. Step 3: Determine if point C represents a solution. mSpace p. 22-23 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Interpreting Points as Solutions

		Solve the problem: An art teacher uses the equation y = 3x to represent the relationship between the area of a painting and the time it takes to dry. Are the points A (1.5, 4.5) and B (2, 6.5) solutions to the equation? Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 23
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 22-23. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Generate solutions to a given equation by substituting values for x. Language Goals: Use the term substitute when replacing one or more of the variables in an equation with a value. Do Now: Evaluate Solutions Who's Right?: Students use prerequisite knowledge to make sense of the relationship between quantities that satisfy a linear equation. Mathematical Thinking: Construct Viable Arguments Teach: Solve a Problem Together Guide students to generate solutions to an equation on mSpace page 24. Step 1: Substitute to find a solution to the equation. Step 2: Complete the table. Step 3: Plot the ordered pairs on the graph. Step 4: Find another ordered pair that solves the equation. mSpace p. 24-25 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess:

		Review Generating Solutions to Equations Find the errors and fix the math. Mathematical Thinking: Use Tools Strategically Exit Ticket: mSpace p. 25
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 24-25. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Generate solutions to equations that represent proportional relationships. Language Goals: Use the term substitute when replacing one or more of the variables in an equation with a value. Do Now: Develop Game Strategy Brain Arcade: Students make use of the structure of numbers to create multiplication expressions with a product of 40. Have several students share their answers. Mathematical Thinking: Make Use of Structure Teach: What's My Point? (Level 1) Students practice finding solutions to equations. Step 1: Spin the spinner twice. Choose which will be the x value and the k-value. Step 2: Substitute the values into the equation, and evaluate to find y. Step 3: Record and plot the ordered pair. Step 4: Determine if the ordered pair is a solution to one of the graphed lines. The player to plot the most solutions wins. mSpace p. 26-29 Guided Practice: Demonstrate, Solve Together

		Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Answer this question: Are the points (6, 3), (8, 16), and (10, 5) collinear? Explain. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p.29
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 26-29. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Reason about a solution to an equation. Language Goals: Explain why an exact solution to a linear equation may not make sense in a given situation. Do Now: Develop Reasoning Skills Which Does Not Belong?: Students reason about a set of coordinates, justify their conclusions, and communicate them to others. Ask several students to explain their reasoning. Mathematical Thinking: Construct Viable Arguments Teach: Solve a Problem Together Guide students to write and solve an equation to find the number of vases Ethan can make in 7 hours on mSpace page 30. Step 1: Identify the variables. Step 2: Find the value of x. Step 3: Reason about the value of x. High-Leverage Practice: Lead a Discussion Step 4: Solve the problem. Make Use of Structure mSpace p. 30-31 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs

	Checking for Understanding	Summarize and Assess: Review Reasoning About Solution Sets Solve the problem: Marty has $50 to spend at a comic book festival. Each comic book costs $8. The equation y = 8x represents the relationship between the number of comic books and the cost. How many comic books can Marty buy? Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p.31
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 30-31. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 3 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Solve problems by representing proportional relationships with equations. Language Goals: Use the term constant of proportionality to describe a constant rate between two quantities. Describe k in the equation y = kx as the constant of proportionality. Do Now: Develop Flexible Thinking Brain Teaser: Students reason about the structure of the figure to determine the shortest and longest paths. Have students share their solutions and explain their reasoning. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of using a scale model to find the length of beams on a bridge on mSpace page 34. Step 1: Analyze the problem. Step 2: Solve for the constant of proportionality, k. Step 3: Express the relationship with an equation, y = kx.

		Step 4: Solve the problem. High-Leverage Practice: Lead a Discussion mSpace p. 34-35 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Finding Equations Using Ratios Select all that apply: Students select all correct answers that relate to the scale photograph. Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 35
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 34-35. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Write and solve equations that represent proportional relationships. Language Goals: Explain that using equations to find values that are not easily identified from a graph helps to determine exact solutions. Do Now: Create Structure Build It: Students observe patterns using numbers and the structure of operations to complete equations. Challenge students to find more than one equation if they have time. Ask students to share their equations. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students to write an equation to find how long it will take Chris to cut through 108 cm of steel on mSpace page 36. Step 1: Make an estimate. Step 2: Identify the constant of proportionality, k. Step 3: Write an equation.

		Step 4: Solve the problem. Use the Vocabulary Routine to teach coefficient. mSpace p. 36-37 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Proportional Relationships Solve the problem: An urban designer uses a computer program to simulate sketches of a park at different times of the day. Based on the graph, how long will the program take to simulate 16 sketches? Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 37
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 36-37. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Determine the part using equations in which the constant of proportionality is a percent. Language Goals: Understand that a percent is another representation of the constant of proportionality for equivalent ratios. Do Now: Develop Estimation Skills Make an Estimate: Students make sense of the quantities using estimation with benchmarks in percent form. Ask students to share their answers and explain their reasoning. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students to use a percent to write an equation and find the number of pixels in an image on mSpace page 38. Step 1: Identify the variables. Step 2: Express the percent as a decimal. Step 3: Write an equation.

		Step 4: Solve the problem. Grade-Level Content Connections: Ratios & Proportional Relationships mSpace p. 38-39 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Using Equations Solve the problem: A landscape architect is redesigning a garden. The area of the new garden is 83% of the area of the original garden. The original garden had an area of 800 square feet. What is the area of the new garden? Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 39
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 38-39. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Solve percent problems using equations in which the constant of proportionality is a percent. Language Goals: Identify what each variable or letter in an equation represents by reasoning about the context of the given problem situation. Do Now: Reason About Numbers Number Strings: Students reason about inverse operations to make sense of quantities in order to fill in missing numbers. Ask students to share their answers. Mathematical Thinking: Use Repeated Reasoning Teach: Solve a Problem Together Guide students to reason about percent to write and solve an equation to find the weight of the statue and base on mSpace page 40. Step 1: Identify the variables. Step 2: Express the percent as a decimal. Step 3: Write an equation.

		Step 4: Solve the problem. Mathematical Thinking: Make Use of Structure mSpace pages 40-41
	Checking for Understanding	Summarize and Assess: Review Solving Percent Problems Solve the problem: An artist is making a print of her sketch. The area of the print is 60% of the area of her sketch. The print has an area of 90 square inches. What is the area of her sketch? Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 41
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 40-41. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Solve a multi-step problem by writing equations that represent proportional relationships. Language Goals: Describe a proportional relationship and ways to represent it. Use the term constant of proportionality when writing equations in the form of $y = kx$. Do Now: Evaluate Solutions Who's Right?: Students justify their conclusions, and respond to the arguments of others. Have students share their solutions. Mathematical Thinking: Construct Viable Arguments Teach: Read a Multi-Step Problem Students analyze a multi-step problem to plan an efficient delivery route for a business. Read It! Read the Problem. Art Apprenticeships Commission Details Analyze It! Analyze the Problem.

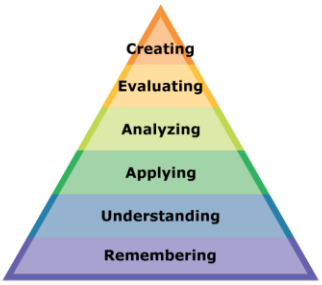
		Make a Decision Grade-Level Content Connections: Expressions & Equations mSpace p. 42-43 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Comparing Proportional Relationships Solve the problem: The value of Sara's art increases to $40 per piece of art. How much money will you earn for every 100 pieces of art you sell as a professional artist if you had apprenticed for Sara? Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 43
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 42-43. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Block 5 Performance Task	
	Teach Teaching Options	Lesson Objective: Create a Scaled Mural Students write equations to represent proportional relationships and find measurements of scale drawings. Teach: Replay Anchor Video – "Model City." Introduce Performance Task. Complete the Performance task mSpace p. 44-45 Evaluate: Students will be evaluated based on Performance Task Rubric Explore, Apply, and Analyze
	Practice and Apply Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking

		Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	mSkills Curriculum Based Assessment 5	Review: To prepare students for mSkills: Download the Block 5 mSkills Strategy Lesson, Student Pages, and Annotated Student Pages to give students targeted practice with assessment item types based on current Block content. You may also teach the mSkills Demo Lesson to give students a general overview of assessment item types based on prerequisite content. Evaluate: To administer mSkills: Go to Class Settings and assign the mSkills assessment to students. Have students log in to the student software. Allow students to review the Problem-Solving Routine. Administer: Reference Guide. The first 20 items will be digitally graded and available in Class Analytics Zone Progress. Enter scores to the constructed-response items in the SDP using the Scoring Rubric. Have students complete the Mindset Strategy in their mSpaces to reflect on their performance in the Block.

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on teacher observations, students doing quality of work together, questioning strategies, self and peer assessment, student record-keeping, quizzes, essays, Quizzes, tests, homework, class discussion, individual conferences, journal writing, performance tasks, diagnostic tests, homework, and projects

Accommodations/Modifications:

- **Use manipulatives to build patterns or represent symbols.**
- **Provide Graphic organizers to use in solving problems.**
- **Provide guided notes/handouts. Break problems into smaller pieces.**
- **Have students keep and turn in a notebook.**
- **Review needed skills prior to the lesson.**
- **Provide checklists for solving problems.**
- **Provide students with a resource page that has multiplication charts, fractions pieces.**
- **Break problems and test sections into smaller pieces.**
- **Allow students extra time to complete projects.**
- **Provide students with an example of project for reference.**
- **Make a clear rubric for students to understand exactly what is expected.**

Summative Assessments:

Periodic chapter tests, state assessments, PSATs, End of Course tests, and SATs

Performance Assessments:

Projects, display of student work, and electronic portfolios

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title: Math Foundations I – Math 180 **Grade Level(s):** **10**	**Unit Summary:** **In this unit students use number sense and visual models to add and subtract positive and negative numbers.**
Essential Question(s): **COURSE II** **Concepts in Block 6** **Big Idea 1:** **How linear relationships have a constant rate of change?** **Big Idea 2:** **How do we represent linear relationships with tables, graphs, and equations?** **Topic 1: Linear Equations** **Topic 2: Slope of a Line** **Topic 3: Interpreting Linear Equations**	Enduring Understanding(s): Students will be able to: • Represent and solve a multi-step problem involving linear relationships. • Reason about a graph to express a linear relationship with an equation. • Reason about a table to express a linear relationship with an equation. • Write a linear equation with a non-zero initial value from a description. • Evaluate an expression by substituting an x-value. • Use visual models and equivalent ratios to solve multi-step problems involving similar triangles. • Determine the slope between two points on a line. • Justify with calculations that the slope of a line is constant. • Use a graph to write the equation of a line in the form y = mx + b. • Identify the y-value given an x-value in an equation y = mx + b. • Analyze the relationship between slope and the vertical or horizontal change of a line. • Identify the y-value given an x-value in an equation y = mx + b. • Estimate and reason about a solution to a linear equation. • Solve for x, given y, in a linear equation y = mx + b. • Construct and use linear models to solve problems.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the NJSLS or Common Core Standards that are applicable

Learning Target	NJSLS or CCSS:
Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.	8.EE.C.8c-
Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.	8.F.B.4-
Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.	8.EE.B.6-
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	8.EE.C.7b-
Interpret the parameters in a linear or exponential function in terms of a context.	HSF-LE.B.5-
Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.	HSF-LE.A.1b-

Inter-Disciplinary Connections:

Real-World problem solving examples: To solve problems related to fields of logistics, environmental science, sales and marketing, public services, Art and Design, entrepreneurship & business, entertainment, information technology and health science

Students will engage with the following text:

Math 180, Scholastic, Inc. 2014

Students will write:

Writing/Open Ended questions: Students will explore how math is used in logistics, organizing, and planning.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills.

Students will uncover and build skills through various classroom activities. Investigating number sense activities, modeling examples, using real-life application, using note-taking strategies, and using SMARTBoard technologies will all be explored. Other learning experiences could include alternative lesson openers, math and history applications, problem solving workshops, interdisciplinary applications and extra examples of problem solving.
Suggested warm-up activities, instructional strategies/activities, and assignments:

Block 6 Linear Equations:	Essential Question: How linear relationships have a constant rate of change? How do we represent linear relationships with tables, graphs, and equations?
Topic 1 (Lesson 1):	
FOCUS AND MOTIVATE	Do Now! Build Career Awareness Block Preview: Have students analyze the Career Explorations on mSpace page 47 to explore careers in the field of entrepreneurship and business. Introduce the Anchor Video "Good Money" Guide students to make connections between entrepreneurship and business and linear relationships.
Teach Teaching Options	Lesson Objective: Represent and solve a multi-step problem involving linear relationships. Language Goals: Understand and use the terms "investor," "loan," and "annual growth" in a problem-solving context. Use the terms value and "overall value" to describe the worth of a business. Teach: Read a Multi-Step Problem

		Students analyze a multi-step problem to plan an efficient delivery route for a business. Read It! Read the Problem. Expand Your Business Business Options Analyze It! Analyze the Problem. Evaluate Your Options Grade-Level Content Connections: Expressions & Equations mSpace p. 47-48 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Comparing Business Plans Find and fix the error: Aiden spends $100 on a lawnmower. He charges $15 for each lawn he mows. How much money does Aiden earn mowing 10 lawns? Aiden earns $ _____ mowing 10 lawns. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 48
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 47-48. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Reason about a graph to express a linear relationship with an equation. Language Goals: Use the term initial value to describe the point where a line crosses the y-axis. Describe the graphs of y = mx and y = mx + b as parallel lines when m has the same value. Do Now: Develop Flexible Thinking Brain Teaser: Students find the values of the items in a grocery bag.

		Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of expressing earnings with equations on mSpace page 52. Step 1: Find the values. Use the Vocabulary Routine to teach initial value. Step 2: Describe the pattern. Step 3: Find the rate. Step 4: Write the equations. mSpace p. 52-53 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Writing a Linear Equation From a Graph Solve the problem: Jill, an interpreter, charges $50 per hour for sign language. She charges an extra $100 for voice translation. Express Jill's earnings with equations. Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 53
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 52-53. Computer Software On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Reason about a table to express a linear relationship with an equation. Language Goals: Describe the graphs of $y = mx$ and $y = mx + b$ as parallel lines when m has the same value. Understand that an initial value refers to the point with the x-coordinate 0. Do Now: Identify Numerical Patterns Find the Pattern:

		Students notice repeated calculations, and look for patterns and shortcuts to determine a rule. Have students compare answers. Mathematical Thinking: Use Repeated Reasoning Teach: Solve a Problem Together Guide students through the steps of using a table to express distances with equations on mSpace page 54. Step 1: Find the rate. Step 2: Compare the values. Step 3: Write the equations. Grade-Level Content Connections: Expressions & Equations mSpace p. 54-55 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Writing a Linear Equation From a Table Solve the problem: Two interior designers offer different starting prices with the same daily rate. Express Amir's and Bruce's earnings with equations. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 55
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 54-55. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Write a linear equation with a non-zero initial value from a description. Language Goals: Understand and use the terms rate and initial value to describe the equation $y = mx + b$. Use the term linear equation to describe any equation whose graph is a straight line. Do Now:

		Develop Number Sense Tell Me All That You Can: Students improve their understanding of linear equations by making sense of quantities and their relationships. Ask several students to share their answers. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of writing an equation to represent the total donations for any number of weeks on mSpace page 56. Step 1: Identify the variables. Step 2: Identify the initial value. Use Think-Pair-Share to have students identify the initial value. Step 3: Find the rate. Step 4: Write the equation. Use the Vocabulary Routine to teach linear equation. mSpace p. 56-57 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Writing a Linear Equation From a Description Solve the problem: Sasha is renting office space for her flower business. She spends $10,000 on office supplies, such as flowers, seeds, and computers. The monthly rent is $2000. Write an equation to model the situation. Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 57.
	Practice and Apply Assigning Homework	Practice in pairs on mSpace pages 56-57. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Topic 1 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Evaluate an expression by substituting an x-value. Language Goals: Identify parts of an expression using the terms sum, product, factor, and coefficient. Use the terms linear equation, variable, and y-value to describe equations. Do Now: Develop Game Strategy Brain Arcade: Students circle the bugs with sums less than 0 in the game Gnat Zapper. Mathematical Thinking: Use Repeated Reasoning

		Teach: Equation Dash (Level 1) Students practice evaluating expressions by substituting values of x. Step 1: Choose an expression and an x-value. Step 2: Substitute the value of x into the expression. Step 3: Evaluate the expression and move your counter the same number of spaces on the board. Step 4: Trade turns. Player B repeats steps 1—3. The first player to reach the finish line wins. mSpace p. 58-61 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Answer this question: You select the expression 12 – x. What x -value would you choose? Explain. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 61
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 58-.61 Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Use visual models and equivalent ratios to solve multi-step problems involving similar triangles. Language Goals: Use visual models and equivalent ratios to solve multi-step problems involving similar triangles. Do Now: Develop Flexible Thinking Brain Teaser: Students fill in the circles with numbers from 1–6 so that each side of the triangle has a sum of 10. Have students compare their answers. Mathematical Thinking: Persevere and Solve Problems

		Teach: Solve a Problem Together Guide students through the steps of determining the length of the base of the ramp on mSpace page 64. Read It! Read the problem. Show It! Represent the problem. Solve It! Solve the problem. Grade-Level Content Connections: Ratios & Proportional Relationships Check It! Check your work. mSpace p. 64-65 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Finding Similar Triangles Select all that apply: Students select all correct answers that relate to the height-to base ratio of a skateboard ramp. Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p. 65
	Practice and Apply Assigning Homework	Practice in pairs on mSpace pages 64-65 Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Determine the slope between two points on a line. Language Goals: Explain that slope is the ratio of the change in y to the change in x. Do Now: Evaluate Solutions Who's Right?: Students make sense of quantities and their relationships in a right triangle. Have students identify the correct statement.

		Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of using a graph to determine the monthly membership rate of Webpix on mSpace page 66. Step 1: Label the change in each direction. Step 2: Find the change in one variable. Step 3: Find the change in the other variable. Step 4: Find the slope and the rate. Use the Vocabulary Routine to teach slope. mSpace p. 66-67 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Determining Slope Solve the problem: Mike, an electrician, charges an hourly rate plus a base fee of $100. What is the hourly rate Mike charges? Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 67
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 66-67. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Justify with calculations that the slope of a line is constant. Language Goals: Explain that the slope between any 2 points on the graph of a linear equation is the same. Explain that the slope is less than 1 when the change in y is less than the change in x. Do Now: Analyze Problems Missing Numbers:

		Students use a pan balance to complete the equations. Mathematical Thinking: Use Tools Strategically Teach: Solve a Problem Together Guide students through the steps of demonstrating that the slope of a line is constant on mSpace page 68. Step 1: Find the slope between points A and B. Step 2: Find the slope between points B and C. Step 3: Find the slope between points A and C. High-Leverage Practice: Lead a Discussion mSpace p. 68-69 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Model Finding Patterns in Slope Solve the problem: Demonstrate that the slope of the line $y = 3x + 2$ is constant. Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p. 69
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 68-69. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Use a graph to write the equation of a line in the form $y = mx + b$. Language Goals: Use the term y-intercept to describe the initial value where the graph crosses the y-axis. Explain that in an equation in slope-intercept form, $y = mx + b$, b is the y-intercept and m is slope. Do Now: Develop Reasoning Skills Which Does Not Belong?:

		Students analyze the graphs to draw a conclusion and then justify and communicate their reasoning. Mathematical Thinking: Construct Viable Arguments Teach: Solve a Problem Together Guide students through the steps of determining whether an ordered pair is a solution to an equation on mSpace page 70. Step 1: Find the slope, m. Step 2: Find the y-intercept. Use the Vocabulary Routine to teach y-intercept. Step 3: Write the equation of the line. Step 4: Verify another solution to the equation. mSpace p. 70-71 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Analyze a Line to Write an Equation Solve the problem: Represent the line with an equation, and determine whether (20, 15) is a solution to the equation. How did you verify the ordered pair? Mathematical Thinking: Use Tools Strategically Exit Ticket: mSpace p.71
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 70-71. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Identify the y-value given an x-value in an equation $y = mx + b$. Language Goals: Identify parts of an expression using the terms coefficient, factor, product, and sum. Use the terms linear equation, variable, x-value, and y-value.

		Do Now: Develop Game Strategy Brain Arcade: Students select the tiles that complete the equation in the game Jetpack Outback. Mathematical Thinking: Use Repeated Reasoning Teach: Equation Dash (Level 2) Students solve for y by substituting a value for x. Step 1: Choose an equation and an x -value. Step 2: Substitute the x-value into the equation. Step 3: Find the value of y, and move your counter the same number of spaces on the board. Step 4: Trade turns. Player B repeats steps 1–3. The first player to reach the finish line is the winner. mSpace p. 72-75 Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Solve the problem: Draw lines to match the x-value that produces the given y-value in the equations. Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p.75
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 72-75. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 3 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Analyze the relationship between slope and the vertical or horizontal change of a line. Language Goals:

		Understand that in a right triangle the slope is the ratio of the length of the height to the length of the base. Do Now: Develop Flexible Thinking Brain Teaser: Students analyze the structure of a puzzle and use the information to find an unknown number. Ask students to share their solutions. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of adjusting a slide on mSpace page 78. Step 1: Analyze the current slope. Step 2: Find the new measurement. Step 3: Graph the adjustment. Step 4: Explain your solution. Mathematical Thinking: Construct Viable Arguments mSpace p. 78-79 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Manipulating Measurements Select all that apply: Students select all correct answers that relate to the on-ramp that a firm is building. Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 79
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 78-79. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Identify the y-value given an x-value in an equation $y = mx + b$ Language Goals:

		Use the term coefficient to describe the numerical part of an expression that is a product of a number and a variable. Use the term substitute when replacing one or more of the variables in an equation. Do Now: Analyze Problems Missing Numbers: Students use a puzzle structure to find a pattern that results in sums of 12. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of determining the cost to cater a party with 6 people on mSpace page 80. Step 1: Make an estimate. Step 2: Identify the parts of the equation. Use Think-Pair-Share to have students write the equation. Step 3: Find the value of y. Step 4: Verify the solution. mSpace p. 80-81 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Finding the Value of y in a Linear Equation Solve the problem: Jada is launching her new website, Songs B Heard. To join, there is a one-time fee of $50 plus $0.25 per song download. How much will it cost to download 100 songs? If Zach has $100, how many songs can he download? Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 81
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 80-81 Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Estimate and reason about a solution to a linear equation. Language Goals:

		Use the term linear equation to describe equations of the form y = mx + b. Do Now: Evaluate Solutions Who's Right?: Students determine which equation is represented by a graph. Mathematical Thinking: Attend to Precision Teach: Solve a Problem Together Guide students through the steps of determining the number of hours a DJ can be hired for $500 on *mSpace* page 82. Step 1: Make an estimate. Step 2: Identify the parts of the equation. Step 3: Find the value of y. Step 4: Reason about your estimate. mSpace p. 82-83 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Estimating a Solution to a Linear Equation Find the error in the equation and fix the math. Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 83
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 82-83. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Solve for x, given y, in a linear equation y = mx + b. Language Goals: Use the term expression to describe all or part of one side of an equation. Explain that the equal symbol separates two expressions that are different names for the same value.

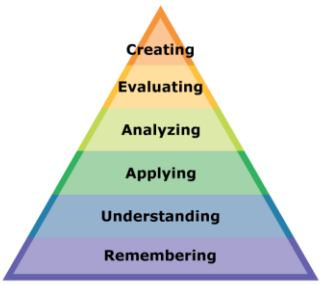
		Do Now: Identify Numerical Patterns Find the Pattern: Students use a table to determine a pattern. Have students share their answers and explain their reasoning. Mathematical Thinking: Use Repeated Reasoning Teach: Solve a Problem Together Guide students through the steps of determining the number of T-shirts a designer can sell for $50 on mSpace page 84. Step 1: Model the problem. Step 2: Substitute the value of y. Step 3: Find the value that makes the equation true. Step 4: Find the value of x. mSpace p. 84-85 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs.
	Checking for Understanding	Summarize and Assess: Review Finding the Value of x in a Linear Equation Solve the problem: Lori, a personal trainer, earns $45 per hour. She already earned $90 from her first client. How many hours will she have to work altogether to earn $225? Lori will have to work _____ hours to earn $225. Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 85.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 84-85. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Construct and use linear models to solve problems. Language Goals: Use terms "annual savings," "worth," "projection," and "investment" when describing solutions to a problem.

		Do Now: Create Structure Build It: Students build an equation using 3 out of 5 of the numbers listed. Have students share their solutions. Mathematical Thinking: Reason Abstractly Teach: Read a Multi-Step Problem Students analyze a multi-step problem to determine if investing in a second location of a restaurant will increase savings over time. Read It! Read the Problem. Business Expansion Plan Savings Projections Analyze It! Analyze the Problem. Choose a Business Plan Explore: Have students discuss the importance of savings and factors that can affect savings. Grade-Level Content Connections: Creating Equations mSpace p. 85-86 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Choosing a Savings Plan Solve the problem: Your goal is to make $1,000,000 as quickly as possible. Should you open another location? Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p. 86.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 85-86. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Block 6 Performance Task	
	Teach Teaching Options	Lesson Objective: Street Fair Sale Students write and use linear equations to evaluate and analyze profits from working at a street fair. Teach: Replay Anchor Video – "Good Money." Introduce Performance Task.

		Complete the Performance task mSpace p. 88-89. Evaluate: Students will be evaluated based on Performance Task Rubric Explore, Apply, and Analyze
	Practice and Apply Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week for homework.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	mSkills Curriculum Based Assessment 6	Review: To prepare students for mSkills: Download the Block 6 mSkills Strategy Lesson, Student Pages, and Annotated Student Pages to give students targeted practice with assessment item types based on current Block content. You may also teach the mSkills Demo Lesson to give students a general overview of assessment item types based on prerequisite content. Evaluate: To administer mSkills: Go to Class Settings and assign the mSkills assessment to students. Have students log in to the student software. Allow students to review the Problem-Solving Routine. Administer: Reference Guide. The first 20 items will be digitally graded and available in Class Analytics Zone Progress. Enter scores to the constructed-response items in the SDP using the Scoring Rubric. Have students complete the Mindset Strategy in their mSpaces to reflect on their performance in the Block.

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS. IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on teacher observations, students doing quality of work together, questioning strategies, self and peer assessment, student record-keeping, quizzes, essays, Quizzes, tests, homework, class discussion, individual conferences, journal writing, performance tasks, diagnostic tests, homework, and projects

Accommodations/Modifications:

- **Use manipulatives to build patterns or represent symbols.**
- **Provide Graphic organizers to use in solving problems.**
- **Provide guided notes/handouts. Break problems into smaller pieces.**
- **Have students keep and turn in a notebook.**
- **Review needed skills prior to the lesson.**
- **Provide checklists for solving problems.**
- **Provide students with a resource page that has multiplication charts, fractions pieces.**
- **Break problems and test sections into smaller pieces.**
- **Allow students extra time to complete projects.**
- **Provide students with an example of project for reference.**
- **Make a clear rubric for students to understand exactly what is expected.**

Summative Assessments:

Periodic chapter tests, state assessments, PSATs, End of Course tests, and SATs

Performance Assessments:

Projects, display of student work, and electronic portfolios

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title: Math Foundations I – Math 180 **Grade Level(s):** **10**	**Unit Summary:** **In this unit students use number sense and visual models to add and subtract positive and negative numbers.**
Essential Question(s): **COURSE II** **Concepts in Block 7** **Big Idea 1:** **How do symbolic representations help to clearly communicate mathematical ideas?** **Big Idea 2:** **How are different types of numbers necessary to solve a range of problems?** **Topic 1: Patterns with negative numbers** **Topic 2: Negative Slope** **Topic 3: Operations with negative numbers**	Enduring Understanding(s): Students will be able to: • Reason with puzzles about the structure of integers and the identity property of addition. • Find the coordinates of plotted points and plot points given their coordinates, in all four quadrants. • Understand that the product of two numbers with different signs is a negative number. • Multiply positive and negative numbers to generate solutions to equations of lines that extend into the third quadrant. • Find the products of positive and negative numbers. • Solve problems by reflecting plotted points over the x-axis or the y-axis. • Determine the horizontal and vertical change between a pair of points on a graphed line. • Determine the slopes of lines graphed in the coordinate plane. • Determine the slope of a line in two ways to show equivalence of fractions. • Find the products of rational numbers. • Reflect points over the origin to plot points in all four quadrants. • Understand that the product of two negative numbers is a positive number. • Develop rules for division of negative numbers by connecting to multiplication. • Reason with puzzles about the structure of rational numbers and the identity property of multiplication.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the NJSLS or Common Core Standards that are applicable

Learning Target	NJSLS or CCSS:
Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.	7.EE.B.3-
Solve real-world and mathematical problems involving the four operations with rational numbers.	7.NS.A.3-
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	8.EE.C.7b-
Apply properties of operations as strategies to multiply and divide rational numbers.	7.NS.A.2c-
Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.	8.G.A.3-
Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.	8.EE.B.6-

Inter-Disciplinary Connections:

Real-World problem solving examples: To solve problems related to fields of logistics, environmental science, sales and marketing, public services, Art and Design, entrepreneurship & business, entertainment, information technology and health science

Students will engage with the following text:

Math 180, Scholastic, Inc. 2014

Students will write:

Writing/Open Ended questions: Students will explore how math is used in logistics, organizing, and planning.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Students will uncover and build skills through various classroom activities. Investigating number sense activities, modeling examples, using real-life application, using note-taking strategies, and using SMARTBoard technologies will all be explored. Other learning experiences could include alternative lesson openers, math and history applications, problem solving workshops, interdisciplinary applications and extra examples of problem solving.
Suggested warm-up activities, instructional strategies/activities, and assignments:

Block 7 Linear Equations:	Essential Question: How do symbolic representations help to clearly communicate mathematical ideas? How are different types of numbers necessary to solve a range of problems?
Topic 1 (Lesson 1):	
FOCUS AND MOTIVATE	Do Now! Build Career Awareness Block Preview: Have students analyze the Career Explorations on mSpace page 91 to explore careers in the field of entertainment. Introduce the Anchor Video "All in Your Head" Guide students to make connections between entertainment and negative numbers.
Teach Teaching Options	Lesson Objective: Reason with puzzles about the structure of integers and the identity property of addition.

		Language Goals: Use the terms Additive Identity Property and additive inverse in the context of numbers whose sum is zero. Teach: Read a Multi-Step Problem Guide students through the steps of creating an answer key for an activity entertainment book. Read It! Read the Problem. Design a Puzzle. Use the Vocabulary Routine to teach Additive Identity Property and additive inverse. Regular Puzzle Analyze It! Analyze the Problem. Develop a Plan Grade-Level Content Connections: Expressions & Equations mSpace p. 94-95 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Negative Number Problems Solve the problem: Jose is creating a similar puzzle for a newspaper. Complete the puzzle. Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p. 95
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 94-95. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Find the coordinates of plotted points and plot points given their coordinates, in all four quadrants. Language Goals: Use the term quadrant to describe any of the four parts into which an area is divided by two lines that intersect at right angles.

		Do Now: Develop Flexible Thinking Brain Teaser: Students use the digits from 1 to 9 to complete a puzzle. Ask several students to share the puzzle solutions and explain their solution process. Mathematical Thinking: Persevere and Solve Problems Teach: Solve a Problem Together Guide students through the steps of building a rectangle in the coordinate plane on mSpace page 96. Step 1: Find the coordinates of point A. Use the Vocabulary Routine to teach coordinate plane. Step 2: Find the coordinates of point C. Use the Vocabulary Routine to teach quadrant. Step 3: Plot point B. Step 4: Complete the rectangle. mSpace p. 96-97 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Plotting Points in Four Quadrants Solve the problem: Build a rectangle in the coordinate plane. Can a point in the first quadrant of the coordinate plane have a negative coordinate? Explain. Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 97
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 96-97. Computer Software On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Understand that the product of two numbers with different signs is a negative number.

		Language Goals: Use the terms factor to describe numbers that are multiplied and product to describe the result. Describe the product as negative if one factor is negative and the other is positive. Do Now: Identify Numerical Patterns Find the Pattern: Students analyze a group of numbers, determine a pattern, and use reasoning to find the sum of another set of numbers. Have students share their solutions and explain their reasoning. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of using a graph and a table to determine the products of positive and negative numbers on mSpace page 98. Step 1: Connect the equation to multiplication. Use the Vocabulary Routine to teach factor and product. Step 2: Use the pattern to find the products. Step 3: Reason to find the product. Step 4: Plot to verify the solution. mSpace p. 98-99 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Multiplying Positive Numbers by Negative Numbers Solve the problem: Find the product of 4 and −2.5. Is the product of −4 and 2.5 equal to the product of 4 and −2.5? Explain. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 99.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 98-99. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.

	Topic 1 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Multiply positive and negative numbers to generate solutions to equations of lines that extend into the third quadrant. Language Goals: Describe the solution to an equation y = kx as (x, y) where y can be determined by substituting a value for x. Do Now: Create Structure Build It: Students analyze integers by filling in ovals with given numbers to create a product of –12. Have students share their solutions and explain their reasoning. Mathematical Thinking: Persevere and Solve Problems Teach: Solve a Problem Together Guide students through the steps of generating solutions to the equation y = 0.25x on mSpace page 100. Step 1: Find a solution in the first quadrant. Step 2: Find solutions in the third quadrant. Step 3: Find another solution. Explore: Have students explore ways to find the product using mental math. mSpace p. 100-101 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Finding Solutions in the Coordinate Plane Solve the problem: Generate solutions to the equation y = 1.5x. James says (−4, 6) is a solution to the equation. How would you respond? Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p. 101.
	Practice and Apply Assigning Homework	Practice in pairs on mSpace pages 100-101. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Topic 1 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Find the products of positive and negative numbers. Language Goals: Use the terms factor, integers, negative, positive, and product to describe the actions while playing. Explain that integers consist of positive and negative whole numbers and 0.

		Do Now: Develop Game Strategy Brain Arcade: Students select the fish with the number that makes the equation true in the game Sea Level. Mathematical Thinking: Make Use of Structure Teach: Multiplication Station (Level 1) Students practice multiplying positive and negative numbers. Step 1: Player A places sticky notes on two factors. Step 2: Player A marks an X on the product. Step 3: Player B moves one sticky note to a new factor. Step 4: Player B marks an O on the product. The first player to get four in a row horizontally, vertically, or diagonally wins. mSpace p. 102-105 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Answer this question: You need a product of −36 to win. The sticky notes are on the factors 8 and −7. Is it possible to win? Explain. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 105
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 102-105. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Solve problems by reflecting plotted points over the x-axis or the y-axis. Language Goals:

		Understand and use the terms line of symmetry, reflection, and quadrant in a problem-solving context. Understand and use the term additive inverse when describing patterns in reflections. Do Now: Develop Number Sense Tell Me All That You Can: Students analyze coordinates to determine properties of ordered pairs with the same absolute values. Have students explain their reasoning to each other. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of creating and describing a reflection in the coordinate plane to create a symmetrical album cover on mSpace page 108. Step 1: Analyze the problem. Use the Vocabulary Routine to teach line of symmetry. Step 2: Plot the reflection points. Step 3: Draw the reflection. Use the Vocabulary Routine to teach reflection. Step 4: Describe the pattern. mSpace p. 108-109 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Reflecting a Figure in the Coordinate Plane Find the error and fix it. Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p. 109
	Practice and Apply Assigning Homework	Practice in pairs on mSpace pages 108-109. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.

	Topic 2 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Determine the horizontal and vertical change between a pair of points on a graphed line. Language Goals: Explain that moving up or to the right represents a positive direction and moving down or to the left represents a negative direction. Do Now: Analyze Problems Missing Numbers: Students identify coordinates of points in the four quadrants of the coordinate plane. Ask students to share their solution to the riddle. Mathematical Thinking: Model With Mathematics Teach: Solve a Problem Together Guide students to solve a problem finding vertical and horizontal change between two points on mSpace page 110. Step 1: Find the coordinates of the points. Step 2: Label the legs of the right triangle. Step 3: Find the change in one variable. Step 4: Find the change in the other variable. mSpace p. 110-111 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Finding Change Between Coordinates Find and fix the errors. Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 111
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 110-111. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.

	Topic 2 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Determine the slopes of lines graphed in the coordinate plane. Language Goals: Use the term slope to describe the ratio of the distance between the y-coordinates of two points on a line to the distance between the x-coordinates of two points. Do Now: Identify Numerical Patterns Find the Pattern: Students use the change pattern between two points to plot a third point. Mathematical Thinking: Attend to Precision Teach: Solve a Problem Together Guide students to find the slope of a line on mSpace page 112. Step 1: Label the legs in each direction. Step 2: Find the change in one variable. Step 3: Find the change in the other variable. Use Think-Pair-Share to have students evaluate the expression and find the change in x. Step 4: Express the slope as a fraction. mSpace p. 112-113 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Calculating Slope in Four Quadrants Solve the problem: Find the slope of the line. How can you use arrows to find slope? Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p. 113
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 112-113. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data.

		Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Determine the slope of a line in two ways to show equivalence of fractions. Language Goals: Understand and use the term rational number to describe a number expressed as the quotient of two integers where the divisor does not equal zero. Do Now: Create Structure Build It: Students use their knowledge of finding differences between integers to identify the coordinates of two points. Ask several students to share their answers and explain their reasoning. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of finding the slope of a line from a graph on mSpace page 114. Step 1: Describe the slope of the line. Step 2: Find the slope from point A to point B. Step 3: Find the slope from point B to point A. Step 4: Reason about the values of the fractions. mSpace p. 114-115 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Using Slope to Show Fraction Equivalence Solve the problem: What is the slope of the line from point A to point B and from point B to point A? Compare the two fractions naming the slope of the line. How are they similar and different? Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p.115
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 114-115. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2:

		Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Find the products of rational numbers. Language Goals: Use the terms factor, negative, positive, and product to describe game strategy. Do Now: Develop Game Strategy Brain Arcade: Students draw a chain of 3 slices of toast in order from least to greatest in the game You're Toast. Mathematical Thinking: Use Repeated Reasoning Teach: Teach Multiplication Station (Level 2) Explain the rules and demonstrate a round. Step 1: Player A places sticky notes on two factors. Step 2: Player A marks an X on the product. Step 3: Player B moves one sticky note to a new factor. Step 4: Player B marks an O on the product. The first player to get four in a row horizontally, vertically, or diagonally is the winner. mSpace p. 116-119 Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Solve the problem: Match each product to the correct pair of factors. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p.119
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 116-119. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2:

		Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 3 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Reflect points over the origin to plot points in all four quadrants. Language Goals: Understand and use the terms quadrant, reflection, and additive inverse in a problem-solving context. Do Now: Develop Flexible Thinking Who's Right?: Students reason about reflections over the x -axis to determine which student is correct. Ask students to share their solutions. Mathematical Thinking**:** Construct Viable Arguments Teach: Solve a Problem Together Guide students through the steps of reflecting an image over the origin and describing the pattern on mSpace page 122. Step 1: Analyze the problem. Step 2: Plot the reflection points. Step 3: Draw the reflection. Step 4: Describe the pattern. mSpace p. 122-123 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Reflections Over the Origin Answer these questions: The reflection of the point (4, 4) over the y-axis is _____. The reflection of the point (4, 4) over the x-axis is _____. The reflection of the point (4, 4) over the origin is _____. Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p. 123
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 122-123. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach	Challenge: Respond to common patterns of Thinking.

	Differentiating Instruction	Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 2): 	
	Teach Teaching Options	Lesson Objective: Understand that the product of two negative numbers is a positive number. Language Goals: Describe the product as positive if factors are both negative or both positive. Do Now: Identify Numerical Patterns Find the Pattern: Students find the pattern to complete the missing values in a table. Have students share their responses and explain their reasoning. Mathematical Thinking: Construct Viable Arguments Teach: Solve a Problem Together Guide students through the steps of describing the patterns in multiplying rational numbers with different signs on mSpace page 124. Step 1: Multiply to find solutions with positive x-values. Step 2: Use the pattern to find the products. Step 3: Describe the rule. Step 4: Apply the rule to find the product. Explore: Have students reason about the products of rationals and the quadrants in which the points representing the products will lie. mSpace p. 124-125 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Multiplying Rational Numbers Find and fix the error: What was the mistake this person made? What would be the sign of the product if another factor is added to the problem: $(-2)\cdot(-4.5)\cdot(-1)$? Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 125
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 124-125 Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone

		Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Evaluate expressions with negative numbers to find solutions to equations in all quadrants. Language Goals: Explain that to find the values of mx + b, you use the order of operations, which is to multiply m by x first before adding b to find the sum. Do Now: Develop Reasoning Skills Which Does Not Belong?: Students discern a pattern and identify the expression that does not belong. Ask several students to share their answers and explain their reasoning. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of evaluating an algebraic expression on mSpace page 126. Step 1: Substitute the value of x. Step 2: Multiply to simplify the expression. Use the Vocabulary Routine to teach order of operations. Step 3: Find the value of y. Explore: Have students use a number line to analyze sums of integers. Step 4: Express the solution and plot to verify. mSpace p. 126-127 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Multiplying Negative Numbers Solve the problem: Evaluate $y = -1/2x - 3$ when $x = -4$ to find the solution. Mathematical Thinking: Use Tools Strategically Exit Ticket: mSpace p. 127
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 126-127. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone

		Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Develop rules for division of negative numbers by connecting to multiplication. Language Goals: Use the terms factor, product, and quotient to explain the relationship of multiplication to division. Explain that $a \div b = c$ also means that $c \cdot b = a$. Do Now: Reason About Numbers Number Strings: Students insert parentheses to make equations true. Ask several students to share their answers and explain their reasoning. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of dividing two negative numbers on mSpace page 128. Step 1: Write the related multiplication equation. Step 2: Find the sign of the other factor. Use Think-Pair-Share to have students determine the sign of the missing factor. Step 3: Find the quotient in the division equation. Use the Vocabulary Routine to teach quotient. High-Leverage Practice: Lead a Discussion Step 4: Multiply to verify the solution. mSpace p. 128-129 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs.
	Checking for Understanding	Summarize and Assess: Review Dividing Negative Numbers Solve the problem: What is $5.25 \div (-1.75)$? Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 129.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 128-129. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone

		Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Reason with puzzles about the structure of rational numbers and the identity property of multiplication. Language Goals: Use the terms Multiplicative Identity Property and multiplicative inverse in the context of predicting patterns about numbers whose product is 1. Do Now: Develop Flexible Thinking Brain Teaser: Students use properties of operations and number sense to find the missing factors and products. Mathematical Thinking: Reason Abstractly Teach: Read a Multi-Step Problem Students analyze a multi-step problem to design and solve a puzzle. Read It! Read the Problem. Design a Puzzle. Use the Vocabulary Routine to teach Multiplicative Identity Property and multiplicative inverse. Regular Puzzle Explore: Have students solve the problem without integers. Analyze It! Analyze the Problem. Develop a Plan Grade-Level Content Connections: Expressions & Equations mSpace p. 130-131 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Product Puzzles Solve the problem: Sandra is creating a similar puzzle for a newspaper. Complete the puzzle. Mathematical Thinking: Make Use of Structure Exit Ticket: mSpace p. 131.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 130-131. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share.

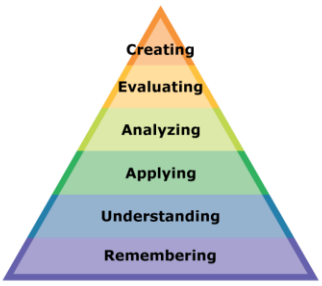
		Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Block 7 Performance Task	
	Teach Teaching Options	Lesson Objective: Compare With Negative Slope Students use data to graph and write equations to make and defend a decision about DVD distribution. Teach: Replay Anchor Video – "All in You Head." Introduce Performance Task. Complete the Performance task mSpace p. 132-133. Evaluate: Students will be evaluated based on Performance Task Rubric Explore, Apply, and Analyze
	Practice and Apply Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week for homework.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	mSkills Curriculum Based Assessment 7	Review: To prepare students for mSkills: Download the Block 7 mSkills Strategy Lesson, Student Pages, and Annotated Student Pages to give students targeted practice with assessment item types based on current Block content. You may also teach the mSkills Demo Lesson to give students a general overview of assessment item types based on prerequisite content.

		Evaluate: To administer mSkills: Go to Class Settings and assign the mSkills assessment to students. Have students log in to the student software. Allow students to review the Problem-Solving Routine. Administer: Reference Guide. The first 20 items will be digitally graded and available in Class Analytics Zone Progress. Enter scores to the constructed-response items in the SDP using the Scoring Rubric. Have students complete the Mindset Strategy in their mSpaces to reflect on their performance in the Block.

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on teacher observations, students doing quality of work together, questioning strategies, self and peer assessment, student record-keeping, quizzes, essays, Quizzes, tests, homework, class discussion, individual conferences, journal writing, performance tasks, diagnostic tests, homework, and projects

Accommodations/Modifications:

- **Use manipulatives to build patterns or represent symbols.**
- **Provide Graphic organizers to use in solving problems.**

- **Provide guided notes/handouts. Break problems into smaller pieces.**
- **Have students keep and turn in a notebook.**
- **Review needed skills prior to the lesson.**
- **Provide checklists for solving problems.**
- **Provide students with a resource page that has multiplication charts, fractions pieces.**
- **Break problems and test sections into smaller pieces.**
- **Allow students extra time to complete projects.**
- **Provide students with an example of project for reference.**
- **Make a clear rubric for students to understand exactly what is expected.**

Summative Assessments:

Periodic chapter tests, state assessments, PSATs, End of Course tests, and SATs

Performance Assessments:

Projects, display of student work, and electronic portfolios

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title: Math Foundations I – Math 180 **Grade Level(s):** **10**	**Unit Summary:** **In this unit students will be able to use tables and graphs to relate the inputs and outputs of a linear function.**
Essential Question(s): **COURSE II** **Concepts in Block 8** **Big Idea 1:** **How do linear functions have a constant rate of change?** **Big Idea 2:** **How can functions be described with patterns or with mathematical rules for inputs to find outputs?** **Topic 1: Representing Functions** **Topic 2: Analyzing Functions** **Topic 3: Squares and Square Roots**	Enduring Understanding(s): Students will be able to: • Understand that a function is a relationship between inputs and outputs in which each input leads to exactly one output. • Use inputs and outputs to graph a linear function. • Use the slope-intercept form of an equation to graph a line. • Determine outputs of functions using a given set of inputs. • Use a graph to write an equation that represents a linear function. • Analyze visual patterns to identify function rules and solve problems. • Use a graph to reason about solutions to linear equations that model real-world situations. • Use a linear equation to find the value of x, given the value of y. • Determine linearity by analyzing how the dependent variable changes with unit changes in the independent variable. • Calculate the value of x in a linear function given the value of y. • Write equations from a visual pattern. • Use a visual model to understand the relationship between squares and square roots. • Determine the output of a quadratic function by squaring its input and using order of operations. • Use the graph of y = x 2 to reason about solutions to the equation x 2= p • Graph the sum of two quadratic functions.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the NJSLS or Common Core Standards that are applicable

Learning Target	**NJSLS or CCSS:**
Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x. The graph of is the graph of the equation y = f(x).	HSF-IF.A.1-

Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	HSA-REI.D.10-
Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.	HSF-IF.B.5-
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.	HSF-IF.B.4-
Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.	HSF-IF.C.7-
Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).	HSF-LE.A.2-
Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.1	8.F.A.1-
Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.	HSF-IF.C.8-
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.	8.EE.C.7b-
Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.	HSF-LE.A.1a-
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	HSA-CED.A.2-
Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that $\sqrt{2}$ is irrational.	8.EE.A.2-
Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.	HSF-IF.A.2-
Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line	8.F.A.3-

Solve quadratic equations by inspection (e.g., for x2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b.	HSA-REI.B.4b-

Inter-Disciplinary Connections:

Real-World problem solving examples: To solve problems related to fields of logistics, environmental science, sales and marketing, public services, Art and Design, entrepreneurship & business, entertainment, information technology and health science

Students will engage with the following text:

Math 180, Scholastic, Inc. 2014

Students will write:

Writing/Open Ended questions: Students will explore how math is used in logistics, organizing, and planning.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Students will uncover and build skills through various classroom activities. Investigating number sense activities, modeling examples, using real-life application, using note-taking strategies, and using SMARTBoard technologies will all be explored. Other learning experiences could include alternative lesson openers, math and history applications, problem solving workshops, interdisciplinary applications and extra examples of problem solving.
Suggested warm-up activities, instructional strategies/activities, and assignments:

Block 8 Linear Equations:	Essential Question: How do linear functions have a constant rate of change? How can functions be described with patterns or with mathematical rules for inputs to find outputs?
Topic 1 (Lesson 1):	
FOCUS AND MOTIVATE	Do Now! Build Career Awareness Block Preview: Have students analyze the Career Explorations on mSpace page 135 to explore careers in the field of information technology. Introduce the Anchor Video "Hack Masters" Guide students to make connections between information technology and functions.
Teach Teaching Options	Lesson Objective: Understand that a function is a relationship between inputs and outputs in which each input leads to exactly one output. Language Goals: Understand and use the terms input, output, and function in a problem-solving context. Teach: Build Career Awareness Students analyze a multi-step problem to test the validity of an employee ID number. Read It! Read the Problem. Create Security Codes Security System Analyze It! Analyze the Problem. Develop a Plan Grade-Level Content Connections: Functions mSpace p. 138-139 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
Checking for Understanding	Summarize and Assess: Review Finding Nonlinear Patterns Select all that apply: Students select all correct answers that relate to an employee ID number. Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 139
Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 138-139. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share.

		Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Use inputs and outputs to graph a linear function. Language Goals: Use the term function to describe a relationship between inputs and outputs. Use the terms input and output to describe the values of x and y in a function. Do Now: Analyze Problems Missing Numbers: Students fill in numbers to make an equation true. Ask several students to share their solutions. Mathematical Thinking: Attend to Precision Teach: Solve a Problem Together Guide students through the steps of graphing a linear function on mSpace page 140. Step 1: Reason about the function. Use the Vocabulary Routine to teach function. Step 2: Use the first input to evaluate the function. Use the Vocabulary Routine to teach input and output. Step 3: Use the second input to evaluate the function. High-Leverage Practice: Lead a Discussion Step 4: Plot the input-output pairs to graph the function. mSpace p. 140-141 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Graphing a Line From Inputs and Outputs Find the error in the table and fix the math. Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 141
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 140-141. Computer Software

		On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Use the slope-intercept form of an equation to graph a line. Language Goals: Use the phrase "slope-intercept form " of an equation to describe the equation represented as $y = mx + b$. Do Now: Develop Reasoning Skills Which Does Not Belong?: Students circle the input-output pair that does not belong. Ask several students to share their solutions and reasoning. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of graphing a linear function on mSpace page 142. Step 1: Plot and identify the y-intercept. Step 2: Express the slope as a fraction. Step 3: Use the slope to plot another point. Step 4: Choose a point to verify the line. Explore: Have students apply the slope in a different way. mSpace p. 142-143 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Graphing a Line From an Equation Solve the problem: Graph the line $y = -2x + 4$. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 143.

	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 142-143. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Determine outputs of functions using a given set of inputs. Language Goals: Use the terms equation, input, output, and coefficient to describe game strategy. Explain that the slope between any 2 points on the graph of a linear equation is the same. Explain that the slope is less than 1 when the change in y is less than the change in x. Do Now: Develop Game Strategy Brain Arcade: Students circle the flowerpot that makes the equation true in the game Ten Garden. Mathematical Thinking: Use Repeated Reasoning Teach: Function Junction (Level 1) Students practice finding outputs for various inputs. Step 1: Choose an equation and an input. Step 2: Find the output. Step 3: Mark the output on the game board. The player to get three in a row wins that round. The player that wins two or more rounds is the winner. mSpace p. 144-147 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Solve the problem: What is the correct input for the equation

		y = –3 x– 3 when the output is 0? Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 147.
	Practice and Apply Assigning Homework	Practice in pairs on mSpace pages 144-147. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Topic 1 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Use a graph to write an equation that represents a linear function. Language Goals: Use the term y-intercept to describe the point with coordinates (0, b) when the solutions to the linear equation y = mx + b are plotted. Do Now: Develop Number Sense Tell Me All That You Can: Students list as many things as they can about a graph. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of writing the equation of a line in slope-intercept form on mSpace page 148. Step 1: Plot and identify the y-intercept. Step 2: Plot a point on the line and find the slope. Step 3: Represent the line with an equation. High-Leverage Practice: Lead a Discussion Step 4: Verify that the point represents a solution. mSpace p. 148-149 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Representing a Line With an Equation Solve the problem: Write the equation of the line, and verify that the point (1, 2) is a solution. How did you use the line to find the slope? Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 149.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 148-149. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master

		Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Analyze visual patterns to identify function rules and solve problems. Language Goals: Understand that an arithmetic sequence follows a pattern of adding a fixed amount from one term to the next. Do Now: Develop Flexible Thinking Brain Teaser: Students reason abstractly about equations of translated functions. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of analyzing a pattern of tiled arches on mSpace page 152. Step 1: Extend the sequence. Step 2: Identify the pattern. Mathematical Thinking: Make Use of Structure Step 3: Represent the function with an equation. Step 4: Solve the problem. High-Leverage Practice: Lead a Discussion mSpace p. 152-153 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Representing Functions Select all that apply: Students select all correct answers that relate to a logo made up of red squares. Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p. 153
	Practice and Apply Assigning Homework	Practice in pairs on mSpace pages 152-153. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone

		Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Use a graph to reason about solutions to linear equations that model real-world situations. Language Goals: Explain that the solution to a real-world problem can be found by analyzing a graph. Do Now: Create Structure Build It: Students choose inputs and outputs to make ordered pairs that are solutions to a linear function. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of finding the number of songs downloaded from a music website on mSpace page 154. Step 1: Model the situation with an equation. Step 2: Use the graph to solve the problem. Step 3: Substitute to verify the equation. Explore: Have students deepen their understanding of negative slope. mSpace p. 154-155 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Using a Graph to Solve a Linear Equation Solve the problem: After an initial 3 albums, a band releases an album on a music website every two years. How many albums has the band released in 6 years altogether? Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 155
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 154-155. Computer Software:

		On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Use a linear equation to find the value of x, given the value of y. Language Goals: Explain that the equal sign separates two expressions that are different names for the same value. Explain that an equation can represent a problem situation. Do Now: Analyze Problems Missing Numbers: Students place given numbers to make three equations true. Have students share their answers. Mathematical Thinking: Persevere and Solve Problems Teach: Solve a Problem Together Guide students through the steps of finding the number of episodes of a reality television show on mSpace page 156. Step 1: Model the situation with an equation. Step 2: Substitute the value of y. Step 3: Find the value that makes the equation true. Step 4: Solve the problem. mSpace p. 156-157 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Solving a Two-Step Linear Equation Solve the problem: A radio station is giving away 50 concert tickets. Each hour, the station gives away 8 tickets. In how many hours will the radio station be down to the last 2 tickets? Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 157

	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 156-157. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Determine linearity by analyzing how the dependent variable changes with unit changes in the independent variable. Language Goals: Explain that if the rates of change between any two points of a graph are different, the graph is of a nonlinear function. Do Now: Evaluate Solutions Who's Right?: Students determine the correct slope from the graph of a linear function. Have students share their responses. Mathematical Thinking: Attend to Precision Teach: Solve a Problem Together Guide students through the steps of determining if a given set of ordered pairs represent a linear function on mSpace page 158. Step 1: Find the ratio for the first pair of ordered pairs. Step 2: Find the ratio for the other pair of ordered pairs. Use Think-Pair-Share to have students determine the rate of change between two points. Step 3: Compare the ratios. Use the Vocabulary Routine to teach nonlinear. Step 4: Plot the ordered pairs. mSpace p. 158-159 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Nonlinear Relationships Find and fix the error in the table.

		Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p.159
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 158-159. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Calculate the value of x in a linear function given the value of y. Language Goals: Use the terms coefficient, equation, input, and output while playing Function Junction. Do Now: Develop Game Strategy Brain Arcade: Students select a number on a turntable that makes a given equation true in the game DJ Why. Mathematical Thinking: Make Use of Structure Teach: Function Junction (Level 2) Students practice finding the input for various outputs. Step 1: Choose an equation and output. Step 2: Find the input. Step 3: Mark the input on the game board. Marking four connecting squares wins a round. The player that wins two out of three rounds is the winner. mSpace p. 160-162 Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Solve the problem: What is the input for the equation $y = -5x - 2$ when the output is 3? Mathematical Thinking: Attend to Precision

		Exit Ticket: mSpace p.162
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 160-162. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 3 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Write equations from a visual pattern. Language Goals: Use the terms area and perimeter. Understand that area is measured in square units. Do Now: Create Structure Build It: Students find the area of a quadrilateral on the coordinate plane. Mathematical Thinking: Attend to Precision Teach: Solve a Problem Together Guide students through the steps of writing equations to represent area and perimeter of figures in a sequence on mSpace page 166. Step 1: Extend the sequence. Step 2: Find the areas. Step 3: Find the perimeters. Step 4: Write the equations to represent the situations. mSpace p. 166-167 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Representing Functions in Multiple Forms Find and fix the error in the equation. Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 167
	Practice and Apply	Solve problems in pairs on mSpace pages 166-167.

	Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Use a visual model to understand the relationship between squares and square roots. Language Goals: Use the terms square number, exponent, and square root to describe a square using equations. Explain that the square root of a number is one of two equal factors of the number. Do Now: Develop Number Sense Tell Me All That You Can: Students list as many facts as they can about an area model. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of relating the length of the side of a square to the square root of the square's area on mSpace page 168. Step 1: Express the area of the square as a product. Use the Vocabulary Routine to teach square number. Step 2: Express the product with an exponent. Use the Vocabulary Routine to teach exponent. Step 3: Express the length of the side as a square root. Use the Vocabulary Routine to teach square root. mSpace p. 168-169 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Relating Squares and Square Roots Select all that apply: Students select all correct answers that relate to the size of a disc jockey's stage. Mathematical Thinking: Model With Mathematics

		Exit Ticket: mSpace p. 169
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 168-169. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Determine the output of a quadratic function by squaring its input and using order of operations. Language Goals: Understand and use the order of operations to evaluate mathematical expressions. Explain that the equations $y = x^2$ and $y = x^2 + r$ are nonlinear functions. Do Now: Develop Reasoning Skills Which Does Not Belong?: Students select the pair of numbers that does not fit the pattern. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of determining the output of a quadratic function on mSpace page 170. Step 1: Substitute the value of x. Step 2: Evaluate the square. Step 3: Find the product. Grade-Level Content Connections: Functions Step 4: Find the sum. mSpace p. 170-171 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Squaring a Number to Evaluate a Function Solve the problem: If $x = -4$, what is the output of $y = 3x^2 + 1$? Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 171
	Practice and Apply	Solve problems in pairs on mSpace pages 170-171.

	Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Use the graph of $y = x^2$ to reason about solutions to the equation $x^2 = p$ Language Goals: Describe a line of symmetry as separating a graph into two parts that are mirror images of each other. Explain that the variable x is squared in a quadratic function. Do Now: Develop Flexible Thinking Brain Teaser: Students solve a riddle involving square numbers. Ask several students to share their answers and their reasoning. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of using the graph of a quadratic function to determine values of x when given a value of y on mSpace page 172. Step 1: Substitute the value of y. Use the Vocabulary Routine to teach quadratic function. Step 2: Estimate the value of x. Step 3: Calculate the value of x. Step 4: Use symmetry to find the negative solution. mSpace p. 172-173 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs.
	Checking for Understanding	Summarize and Assess: Review Reasoning About Solutions to $x^2 = p$ Solve the problem: The graph represents a quadratic function. Find the values of x when y = 2. Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p. 173.
	Practice and Apply	Solve problems in pairs on mSpace pages 172-173.

	Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Graph the sum of two quadratic functions. Language Goals: Understand the difference between a linear function and a quadratic function. Do Now: Identify Numerical Patterns Find the Pattern: Students notice patterns and look for shortcuts when simplifying mathematical expressions. Mathematical Thinking: Use Repeated Reasoning Teach: Read a Multi-Step Problem Students analyze a multi-step problem to plan an efficient delivery route for a business. Read It! Read the Problem. User Testing Mai's and Tim's Data Mathematical Thinking: Model With Mathematics Analyze It! Analyze the Problem. Develop a Plan Grade-Level Content Connections: Functions mSpace p. 174-175 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Finding the Sum of Functions Solve the problem: Adam, a game programmer, wrote a game where the blue team goes first in each round and the red team goes second. If they continue taking turns and scoring 1 more point than the other every round, how many points will the red team have after 20 rounds? Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 175.

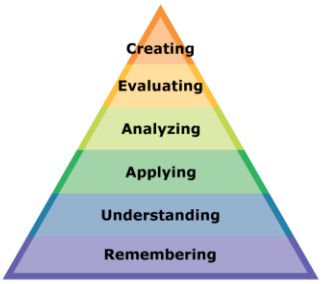
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 174-175. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Block 8 Performance Task	
	Teach Teaching Options	Lesson Objective: Design a Game Board Students write linear and nonlinear functions to solve a problem involving area of squares. Teach: Replay Anchor Video – "Hack Masters." Introduce Performance Task. Complete the Performance task mSpace p. 176-177. Evaluate: Students will be evaluated based on Performance Task Rubric Explore, Apply, and Analyze
	Practice and Apply Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week for homework.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	mSkills Curriculum Based Assessment 8	Review: To prepare students for mSkills:

		Download the Block 8 mSkills Strategy Lesson, Student Pages, and Annotated Student Pages to give students targeted practice with assessment item types based on current Block content. You may also teach the mSkills Demo Lesson to give students a general overview of assessment item types based on prerequisite content. Evaluate: To administer mSkills: Go to Class Settings and assign the mSkills assessment to students. Have students log in to the student software. Allow students to review the Problem-Solving Routine. Administer: Reference Guide. The first 20 items will be digitally graded and available in Class Analytics Zone Progress. Enter scores to the constructed-response items in the SDP using the Scoring Rubric. Have students complete the Mindset Strategy in their mSpaces to reflect on their performance in the Block.

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.

IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on teacher observations, students doing quality of work together, questioning strategies, self and peer assessment, student record-keeping, quizzes, essays, Quizzes, tests, homework, class discussion, individual conferences, journal writing, performance tasks, diagnostic tests, homework, and projects

Accommodations/Modifications:

- **Use manipulatives to build patterns or represent symbols.**
- **Provide Graphic organizers to use in solving problems.**
- **Provide guided notes/handouts. Break problems into smaller pieces.**
- **Have students keep and turn in a notebook.**
- **Review needed skills prior to the lesson.**
- **Provide checklists for solving problems.**
- **Provide students with a resource page that has multiplication charts, fractions pieces.**
- **Break problems and test sections into smaller pieces.**
- **Allow students extra time to complete projects.**
- **Provide students with an example of project for reference.**
- **Make a clear rubric for students to understand exactly what is expected.**

Summative Assessments:

Periodic chapter tests, state assessments, PSATs, End of Course tests, and SATs

Performance Assessments:

Projects, display of student work, and electronic portfolios

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

<table>
<tr><td>Course/Unit Title:
Math Foundations I – Math 180

Grade Level(s):
10</td><td>Unit Summary:
In this unit students will compare functions represented in different ways.</td></tr>
<tr><td>Essential Question(s):
COURSE II
Concepts in Block 9

Big Idea 1:
How does flexibility in expressing quantities and the relationships between them allow us to analyze different quantities?

Big Idea 2:
How algebraic reasoning is a way to express, understand, and compare relationships between functions?

Topic 1: Comparing Linear Functions
Topic 2: Reasoning with Linear Systems
Topic 3: Solutions of Systems</td><td>Enduring Understanding(s):

Students will be able to:
• Reason about verbal descriptions to compare quantities.
• Compare two linear functions, one described verbally, and one described in a table.
• Compare two linear functions, one described verbally, and one described in a graph.
• Compare two linear functions, one described verbally and one described with an equation.
• Calculate the value of y in equations in the form of $y = mx + b$.
• Solve equations with variables on both sides of the equal sign.
• Compare the x-intercepts in graphs of functions that model real-world situations.
• Reason about the solutions to a system of equations in a table.
• Model a real-world problem with a system of linear graphs and interpret their intersection as the solution to the problem.
• Calculate the solution (x, y) for a system of equations—one in the form of $y = kx$ and the other in the form of $y = ax^2 + c$.
• Solve systems of linear equations with substitution.
• Determine if an ordered pair is a solution to a system of two linear equations by checking if its coordinates solve both equations.
• Graph a system of linear equations and reason about its solution.
• Interpret the graph of a system of functions and reason about its intersections and solutions.
• Solve a multi-step problem by reasoning about and comparing two functions.</td></tr>
</table>

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the NJSLS or Common Core Standards that are applicable

Learning Target	**NJSLS or CCSS:**
Analyze and solve pairs of simultaneous linear equations.	8.EE.C.8
For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.	HSF-IF.B.4-
Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.	HSF-IF.C.9-
Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	HSA-REI.C.6-
Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.	HSA-REI.C.5-
Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.	HSA-REI.C.7-
Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.	HSF-IF.C.7-
Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.	HSA-CED.A.2-
Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).	HSA-REI.D.10-
Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method	HSA-REI.A.1-
Distinguish between situations that can be modeled with linear functions and with exponential functions.	HSF-LE.A.1-

Inter-Disciplinary Connections:

Real-World problem solving examples: To solve problems related to fields of logistics, environmental science, sales and marketing, public services, Art and Design, entrepreneurship & business, entertainment, information technology and health science

Students will engage with the following text:

Math 180, Scholastic, Inc. 2014

Students will write:

Writing/Open Ended questions: Students will explore how math is used in logistics, organizing, and planning.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Students will uncover and build skills through various classroom activities. Investigating number sense activities, modeling examples, using real-life application, using note-taking strategies, and using SMARTBoard technologies will all be explored. Other learning experiences could include alternative lesson openers, math and history applications, problem solving workshops, interdisciplinary applications and extra examples of problem solving.
Suggested warm-up activities, instructional strategies/activities, and assignments:

Block 9 Comparing Linear Functions	Essential Question: How does flexibility in expressing quantities and the relationships between them allow us to analyze different quantities? How algebraic reasoning is a way to express, understand, and compare relationships between functions?
Topic 1 (Lesson 1):	
FOCUS AND MOTIVATE	Do Now! Build Career Awareness Block Preview: Have students analyze the Career Explorations on mSpace page 179 to explore careers in the field of health science. Introduce the Anchor Video "Out on a Limb" Guide students to make connections between health sciences and systems of equations.
Teach Teaching Options	Lesson Objective: Reason about verbal descriptions to compare quantities. Language Goals: Express the quantities in a contextualized problem using variables and algebraic reasoning. Teach: Read a Multi-Step Problem Students analyze a multi-step problem to plan an efficient delivery route for a business. Read It! Read the Problem. Fitness Training Tug-of-War Matches Analyze It! Item text TK. Evaluate the Teams Grade-Level Content Connections: Expressions & Equations mSpace p. 179-180 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
Checking for Understanding	Summarize and Assess: Review Comparing Unknown Quantities Solve the problem: Which team will win round 4? Explain your reasoning.

		Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 180
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 179-180. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Compare two linear functions, one described verbally, and one described in a table. Language Goals: Use the term initial value to describe a situation in which the starting position is not 0. Do Now: Develop Flexible Thinking Brain Teaser: Students analyze the relationships among the sums to solve a puzzle. Ask students to explain their reasoning and strategies. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of determining which device has a greater battery charge at a given time on mSpace page 184. Step 1: Complete the table. Step 2: Compare the initial values. Step 3: Find the input for which both functions have the same output. Step 4: Compare the outputs of the functions. mSpace p. 184-185 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Comparing Linear Functions Using a Table Solve the problem: A trainer compares the calories Jordan and Nico burn as they run. Jordan burned 60 calories before his run. Nico starts

		with 0 calories burned. Nico burns 75 calories per mile. Who has burned more calories after 5 miles? Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 185
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 184-185. Computer Software On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Compare two linear functions, one described verbally, and one described in a graph. Language Goals: Use the term intersection to describe the point where the graphs of equations cross each other. Do Now: Evaluate Solutions Who's Right?: Students use a graph to determine which doctor has seen more patients. Have students share their answers. Mathematical Thinking: Construct Viable Arguments Teach: Solve a Problem Together Guide students through the steps of using a graph to determine which virus will affect more people on mSpace page 186. Step 1: Graph the other function. Step 2: Compare the initial values. Step 3: Find the input for which both functions have the same output. Use the Vocabulary Routine to teach intersection. Step 4: Compare the outputs for the given input. mSpace p. 186-187 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess:

		Review Comparing Functions Using a Graph Solve the problem: An insurance company has two prescription plans. The total cost for plan C is shown on the graph. Plan D has an initial cost of $20, and then costs $5 per prescription. Which plan costs less when buying 3 prescriptions? Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 187.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 186-187. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 1 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Compare two linear functions, one described verbally and one described with an equation. Language Goals: Use the term initial value when referring to the value of y when x is 0. Use the phrase rate of change when comparing the slope of lines. Do Now: Develop Reasoning Skills Which Does Not Belong?: Students circle the equation that does not belong. Ask several students to share their solutions. Mathematical Thinking: Construct Viable Arguments Teach: Solve a Problem Together Guide students through the steps of determining which function has a lesser output for a given input on mSpace page 188. Step 1: Write an equation for the other function. Step 2: Compare the initial values. Step 3: Compare the rates of change. Step 4: Compare the outputs for the given input. mSpace p. 188-189 Guided Practice: Demonstrate, Solve Together

		Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Comparing Functions With Equations Solve the problem: Function A has an initial value of 2, and its rate of change is 2. Function B is represented by the equation $y = 4x - 5$. Which function has a lesser output for an input of 3? Mathematical Thinking: Model With Mathematics Exit Ticket: mSpace p. 189.
	Practice and Apply Assigning Homework	Practice in pairs on mSpace pages 188-189. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Topic 1 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Calculate the value of y in equations in the form of $y = mx + b$. Language Goals: Use the term linear equation to describe equations of the form $y = mx + b$. Use the terms equation, evaluate, output, substitute, and symbol to describe game strategy. Do Now: Develop Game Strategy Brain Arcade: Students circle three equivalent tiles to make a match in the game Decked Out. Mathematical Thinking: Make Use of Structure Teach: Guess My Symbol (Level 1) Students choose values of symbols in an equation and find the output. Step 1: Players choose and record all values for O. Step 2: Player A chooses a value for Δ. Step 3: Players evaluate and record the output. Step 4: Repeat steps 2–3. Player B chooses Δ. The player with the greatest total output after six rounds is the winner. mSpace p. 190-193 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Solve the problem: What is the greatest possible output for the equation below? Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 193.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 190-193. Computer Software:

		On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #1: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Solve equations with variables on both sides of the equal sign. Language Goals: Use the term linear equation to describe equations of the form $y = mx + b$. Understand and use term to refer to the numbers, the variables, or their products in an equation . Do Now: Develop Flexible Thinking Brain Teaser: Students solve a number riddle involving a two-digit number. Ask students to explain their reasoning. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of solving an equation with variables on both sides on mSpace page 196. Step 1: Simplify the equation. Use the Vocabulary Routine to teach term. Step 2: Solve the equation. Step 3: Check your work. Explore: Have students discuss other ways they could have simplified the equation. Grade-Level Content Connections: Algebra mSpace p. 196-197 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Solving Problems With Equations

		Select all that apply: Students select all correct answers that relate to equivalent expressions and equations. Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 197
	Practice and Apply Assigning Homework	Practice in pairs on mSpace pages 196-197. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson based on software data. Stretch Lesson based on software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Compare the x-intercepts in graphs of functions that model real-world situations. Language Goals: Use the term x-intercept to describe a point (x, 0). Explain that to find the x-intercept, we can substitute 0 for y in an equation, and solve for x. Do Now: Create Structure Build It: Students choose numbers to make multiple ordered pairs that satisfy a linear equation. Ask several students to share answers and explain reasoning. Mathematical Thinking: Reason Abstractly Teach: Solve a Problem Together Guide students through the steps of comparing the times when two medical samples reach a temperature of 08 C on mSpace page 198. Step 1: Find the x-intercepts. Use the Vocabulary Routine to teach x- intercept. Step 2: Verify the first x-intercept. Step 3: Verify the other x-intercept.

		Step 4: Analyze the intercepts. mSpace p. 198-199 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Interpreting x-Intercepts Solve the problem: Todd and Gemma take a health test. The graph shows the time it takes them to complete the test. Label the x-intercepts. Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 199
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 198-199. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Reason about the solutions to a system of equations in a table. Language Goals: Explain that the solution to a system of equations is the point or points whose coordinates satisfy each equation. Use the term linear equation to describe equations of the form $y = mx + b$. Do Now: Identify Numerical Patterns Find the Pattern: Students look for patterns as they find the missing numbers in an equation using the values in a table. Mathematical Thinking: Use Repeated Reasoning Teach: Solve a Problem Together Guide students to on mSpace page 200. Step 1: Find solutions to the first equation.

		Step 2: Find solutions to the other equation. Step 3: Reason about the solutions. Use the Vocabulary Routine to teach systems of equations. Step 4: Interpret the solution to the system. Grade-Level Content Connections: Expressions & Equations mSpace p. 200-201 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review a System of Equations Solve the problem: At a health fair race, Shanté runs at a speed of 6 mi/h. Derek starts the race 4 miles past the starting line, and he jogs at a speed of 4 mi/h. When will Shanté pass Derek? Mathematical Thinking: Use Tools Strategically Exit Ticket: mSpace p. 201
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 200-201. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Model a real-world problem with a system of linear graphs and interpret their intersection as the solution to the problem. Language Goals: Explain that a function is a mapping of inputs and outputs that are expressed as ordered pairs, where values for x are the inputs and values for y are the outputs. Use the term linear equation to describe equations of the form $y = mx + b$. Do Now: Evaluate Solutions Who's Right?: Students make use of definitions and prior knowledge to analyze two different answers, identify the correct one, and justify their reasoning. Mathematical Thinking: Attend to Precision.

		Teach: Solve a Problem Together Guide students to on mSpace page 202. Step 1: Analyze the graph of the function. Step 2: Plot points to graph the other function. Step 3: Plot and interpret the point of intersection. Step 4: Solve the problem. Step 4: Plot the ordered pairs. mSpace p. 202-203 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Graphs of Linear Functions Solve the problem: A pharmacy has two prescription plans. Plan Y has an initial cost. Plan Z does not have an initial cost, but the cost of each prescription is $10. Which plan will cost less for a person who gets 6 prescriptions? Mathematical Thinking: Construct Viable Arguments Exit Ticket: mSpace p.203
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 202-203. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 2 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Calculate the solution (x, y) for a system of equations—one in the form of $y = kx$ and the other in the form of $y = ax^2 + c$. Language Goals: Use the terms ordered pair, quadrant, solution, and system of equations to describe game strategy. Do Now: Develop Game Strategy Brain Arcade: Students circle the bugs with products less than 60 in the game

		Gnat Zapper. Mathematical Thinking: Use Repeated Reasoning Teach: Guess My Symbol (Level 2) Students practice creating equations and finding the solution. Step 1: Choose values for Δ and O. Step 2: Solve for the missing values. Step 3: Record the solution and functions. Step 4: Find the quadrant of the solution and record the number of points earned. The player with the most points after 4 turns wins. mSpace p. 204-207 Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Game Strategy Solve the problem: Students choose a value for Δ and O using given numbers to create a function. Mathematical Thinking: Attend to Precision Exit Ticket: mSpace p. 207
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 204-207. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #2: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Accommodations/Modifications:	Students can work on additional software as a supplement to class instruction.
	Topic 3 (Lesson 1):	
	Teach Teaching Options	Lesson Objective: Solve systems of linear equations with substitution. Language Goals: Use and understand the term substitute in reference to an expression and a value. Do Now: Develop Flexible Thinking Brain Teaser: Students solve a number riddle by reasoning about three abstract clues.

		Mathematical Thinking: Reason Abstractly Teach: Guide students to on mSpace page 210. Step 1: Represent the problem Step 2: Write an equation with one variable. Explore: Have students explore other possible equations and substitutions. Step 3: Solve for the first variable. Step 4: Solve for the other variable. mSpace p. 210-211 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Solving Systems of Equations Select all that apply: Students select all equations that have the ordered pair (5, 25) as a solution. Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 211
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 210-211. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 2):	
	Teach Teaching Options	Lesson Objective: Determine if an ordered pair is a solution to a system of two linear equations by checking if its coordinates solve both equations. Language Goals: Describe the solution to an equation y = kx as (x, y) where y can be determined by substituting a value for x. Explain that a solution to a system of equations is the ordered pair whose coordinates satisfy both equations. Do Now: Analyze Problems Missing Numbers:

		Students use given numbers to create two linear equations for which the ordered pair (2, 5) is a solution. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students through the steps of determining if a given ordered pair is a solution to a system of linear equations on mSpace page 212. Step 1: Determine if the ordered pair is a solution to the first equation. Step 2: Determine if the ordered pair is a solution to other equation. Step 3: Determine if the ordered pair is a solution to the system. Step 4: Use the graph to find the solution to the system. mSpace p. 212-213 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Determining If an Ordered Pair Is a Solution Solve the problem: Is the ordered pair $(-2, 2)$ the solution to the system of equations: $y = -4x - 6$ and $y = 1/2x + 3$? Mathematical Thinking: Use Tools Strategically Exit Ticket: mSpace p. 213
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 212-213. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 3):	
	Teach Teaching Options	Lesson Objective: Graph a system of linear equations and reason about its solution. Language Goals: Explain that a solution to a system of two linear functions is either one point or no points. Use the term linear equation to describe equations of the form $y = mx + b$. Do Now: Develop Reasoning Skills Which Does Not Belong?:

		Students evaluate a set of ordered pairs to discern a pattern and identify the ordered pair that does not belong. Ask several students to share their answer and explain their reasoning. Mathematical Thinking: Make Use of Structure Teach: Solve a Problem Together Guide students to on mSpace page 214. Step 1: Find the slope and y-intercept of each line. Step 2: Graph line A. Step 3: Graph line B. Step 4: Find the solution. mSpace p. 214-215 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Graphing a System of Linear Equations Select all that apply: Students select all true statements about the equations of the lines. Mathematical Thinking: Reason Abstractly Exit Ticket: mSpace p. 215
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 214-215. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 4):	
	Teach Teaching Options	Lesson Objective: Interpret the graph of a system of functions and reason about its intersections and solutions. Language Goals: Explain that the solution to a system of two nonlinear and linear functions may have more than one solution. Use the term linear equation to describe equations of the form $y = mx + b$. Do Now: Evaluate Solutions Who's Right?:

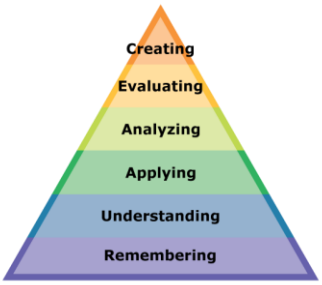
		Students analyze different solutions to the same problem and justify their conclusions. Mathematical Thinking: Construct Viable Arguments Teach: Solve a Problem Together Guide students to on mSpace page 216. Step 1: Analyze the functions. High-Leverage Practice: Lead a Discussion Step 2: Determine the number of intersections. Step 3: Interpret the points. mSpace p. 216-217 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs.
	Checking for Understanding	Summarize and Assess: Review Finding Other Solution Sets Find the error in the solution and fix the math. What error did Ron make? Explain. Mathematical Thinking: Persevere and Solve Problems Exit Ticket: mSpace p. 217.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 216-217. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Topic 3 (Lesson 5):	
	Teach Teaching Options	Lesson Objective: Solve a multi-step problem by reasoning about and comparing two functions. Language Goals: Use the terms linear, nonlinear, and function to describe problem situations. Do Now: Identify Numerical Patterns Find the Pattern: Students use the structure of the array to find the number that matches the multiple conditions. Mathematical Thinking: Make Use of Structure

		Teach: Read a Multi-Step Problem Students analyze a multi-step problem to plan an efficient delivery route for a business. Read It! Read the Problem. Physical Therapy Exercise Plan Explore: Have students double and triple a number a few times. Then use that number as the input for y = 2x and y = 3x Analyze It! Analyze the Problem. Analyze the Plans Grade-Level Content Connections: Functions mSpace p. 218-219 Guided Practice: Demonstrate, Solve Together Practice: Solve problems in pairs
	Checking for Understanding	Summarize and Assess: Review Comparing Routes Solve the problem: Kendra suggests another exercise plan. It is shown in the table. How many repetitions will Kendra do on day 8 of this plan? Explain your reasoning. Mathematical Thinking: Use Repeated Reasoning Exit Ticket: mSpace p. 219.
	Practice and Apply Assigning Homework	Solve problems in pairs on mSpace pages 218-219. Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week. Related HW assignments will be given using Kuta Software.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	Block 9 Performance Task	
	Teach Teaching Options	Lesson Objective: Analyze Fitness Plans Students analyze and compare two fitness plans using linear equations and graphs. Teach: Replay Anchor Video – "Out on a Limb." Introduce Performance Task. Complete the Performance task mSpace p. 220-221. Evaluate: Students will be evaluated based on Performance Task Rubric

		Explore, Apply, and Analyze
	Practice and Apply Assigning Homework	Computer Software: On a daily basis, students are split into two groups: Group 1: whole group guided instruction, Pair Share. Group 2: Student Software: Explore Zone Learn Zone/Fast Track: Think, Try, Practice, Master Success Zone Brain Arcade: Students are responsible to complete 20 minutes in the Brain Arcade per week for homework.
	Assess and Reteach Differentiating Instruction	Challenge: Respond to common patterns of Thinking. Elicit Student Thinking Modify Tasks Using Data to Differentiate Checkpoint #3: Use Groupinator to analyze student data and recommend groups and differentiated instruction lessons for each rotation. Review Data: Review the performance data and groupings. Plan Instruction: Based on Rotations, access digital lessons. Boost Lesson related to software data. Stretch Lesson related to software data.
	mSkills Curriculum Based Assessment 9	Review: To prepare students for mSkills: Download the Block 9 mSkills Strategy Lesson, Student Pages, and Annotated Student Pages to give students targeted practice with assessment item types based on current Block content. You may also teach the mSkills Demo Lesson to give students a general overview of assessment item types based on prerequisite content. Evaluate: To administer mSkills: Go to Class Settings and assign the mSkills assessment to students. Have students log in to the student software. Allow students to review the Problem-Solving Routine. Administer: Reference Guide. The first 20 items will be digitally graded and available in Class Analytics Zone Progress. Enter scores to the constructed-response items in the SDP using the Scoring Rubric. Have students complete the Mindset Strategy in their mSpaces to reflect on their performance in the Block.

PART IV: EVIDENCE OF LEARNING

IDENTIFY THE METHODS BY WHICH STUDENTS WILL DEMONSTRATE THEIR UNDERSTANDING OF CONTENT AND THEIR ABILITY TO APPLY SKILLS.
IDENTIFY BLOOM'S LEVELS.



Formative Assessments:

The effectiveness of the instructional program will be based on teacher observations, students doing quality of work together, questioning strategies, self and peer assessment, student record-keeping, quizzes, essays, Quizzes, tests, homework, class discussion, individual conferences, journal writing, performance tasks, diagnostic tests, homework, and projects

Accommodations/Modifications:

- **Use manipulatives to build patterns or represent symbols.**
- **Provide Graphic organizers to use in solving problems.**
- **Provide guided notes/handouts. Break problems into smaller pieces.**
- **Have students keep and turn in a notebook.**
- **Review needed skills prior to the lesson.**
- **Provide checklists for solving problems.**
- **Provide students with a resource page that has multiplication charts, fractions pieces.**
- **Break problems and test sections into smaller pieces.**
- **Allow students extra time to complete projects.**
- **Provide students with an example of project for reference.**
- **Make a clear rubric for students to understand exactly what is expected.**

Summative Assessments:

Periodic chapter tests, state assessments, PSATs, End of Course tests, and SATs

Performance Assessments:

Projects, display of student work, and electronic portfolios