ALGEBRA FOUNDATIONS

SYLLABUS

2022- 2023 Academic School-Year

Marking Period 1

Chapter 1 – Solving Linear Equations (Test 1.1-1.5)

Section	Title NJSLS	Problems *Teachers should assign mixed review problems as needed
1.1	Solving Simple Equations *NJSLS-A-CED.A.1, NJSLS-A-REI.A.1, NJSLS-A-REI.B.3*	Big Ideas Text p. 8-19 #1-47 Algebra 1 Foundations Series Text p. 91-93 #1-47 IXL: BQT, AL9, D65
1.2	Solving Two -Step Equations *NJSLS-N-Q.A.1, NJSLS-A-CED.A.1, NJSLS-A-REI.B.3*	Big Ideas Text p. 16 #3-10, 35 Algebra 1 Foundations Series Text p. 97-99 #1-33, 40-47 IXL: QVK
1.2	Solving Multi-Step Equations *NJSLS-N-Q.A.1, NJSLS-A-CED.A.1, NJSLS-A-REI.B.3*	Big Ideas Text p. 16-18 #11-44, 49, 57-65 Algebra 1 Foundations Series Text p. 103 -104 #1-30 IXL: W82, 55K
1.3	Solving Equations with Variables on Both Sides *NJSLS-A-CED.A.1, NJSLS-A-REI.B.3*	Big Ideas Text p. 23-24 #1-30, 33, 38, Algebra 1 Foundations Series Text p. 1114-116 #1-28, 35-39 IXL: ZYL, 7S7
1.4	Solving Absolute Value Equations *NJSLS-A-CED.A.1, NJSLS-A-REI.B.3*	Big Ideas Text p. 32-34 #1-25, 49-50 Algebra 1 Foundations Series Text p. 224-225 #1-22, 30,33 IXL: 9LF, 2JZ
1.5	Rewriting Equations and Formulas *NJSLS-A-CED.A.4*	Big Ideas Text p. 40-42 #1-28, 38 Algebra 1 Foundations Series Text p. 120-122 #1-10, 19-24, 25-32 IXL: WSJ

Chapter 2 – Solving Linear Inequalities (Test 2.1-2.6)

Section	Title	NJSLS	Problems
2.1	Writing and Graphing Inequalities	*NJSLS-A-CED.A.1*	Big Ideas Text p. 58-60 #1-46, 48-52 Algebra 1 Foundations Series Text p. 176-177 #1-28; p. 180-182 # 1-34 IXL: JNL, CXX
2.2	Solving Inequalities Using Addition or Subtraction	*NJSLS-A-CED.A.1, NJSLS-A-REI.B.3*	Big Ideas Text p. 65-66 #1-35, 39-46 Algebra 1 Foundations Series Text p. 187-188 #1-52 IXL: RZV
2.3	Solving Inequalities Using Multiplication or Division	*NJSLS-A-CED.A.1, NJSLS-A-REI.B.3*	Big Ideas Text p. 71-72 #1-34, 40-43 Algebra 1 Foundations Series Text p. 194-196 #1-32, 40-50 IXL: BRJ
2.4	Solving Multi-Step Inequalities	*NJSLS-A-CED.A.1, NJSLS-A-REI.B.3*	Big Ideas Text p. 77-78 #1-34 Algebra 1 Foundations Series Text p. 202-204 #1-39 IXL: 6AZ
2.5	Solving Compound Inequalities	*NJSLS-A-CED.A.1, NJSLS-A-REI.B.3*	Big Ideas Text p. 85-86 #1-23, 25-32 Algebra 1 Foundations Series Text p. 219-220 #1-23, 28 IXL: GXA
2.6	Solving Absolute Value Inequalities	*NJSLS-A-CED.A.1, NJSLS-A-REI.B.3*	Big Ideas Text p. 91-92 #1-17, 19, 21 Algebra 1 Foundations Series Text p. 228 #1-22 IXL: HXH UKU

Marking Period 2

Chapter 3 – Graphing Linear Functions (Test 3.1-3.5, 3.7)

Section	Title NJSLS		Problems
3.1	Functions *NJSLS-F-IF.A.1*		Big Ideas Text p. 108-110 #1-24 Algebra 1 Foundations Series Text p. 251-254 #1-18 IXL: QTA, JZD
3.2	Linear Functions	*NJSLS-A-CED.A.2, NJSLS-A-REI.D.10, NJSLS-F-IF.B.5, NJSLS-F-IF.C.7a, NJSLS-F-LE.A.1b*	Big Ideas Text p. 117-120 #1-34, 36, 38 Algebra 1 Foundations Series Text p. 258-260 #1-18 IXL: VMQ, F5G
3.3 Function Notation (Graphing Using a Function Rule)	Standard Form (Using Intercepts)	*NJSLS-A-CED.A.2, NJSLS-F-IF.A.1, NJSLS-F-IF.A.2, NJSLS-F-IF.C.7a, NJSLS-F-IF.C.9*	1 Foundations Series Text p. 274-276 #1-21 IXL: LNV, DC2
3.4 Graphing Linear Equations in	Big Ideas Text p. 125-126 #1-22 Algebra	*NJSLS-A-CED.A.2, NJSLS-F-IF.C.7a*	Big Ideas Text p. 133-134 #1-35 Algebra 1 Foundations Series Text p. 353-356 #1-29, 35-36 IXL: 8SN, 7MZ
*Supplement	Rate of Change and Slope	*NJSLS-A-CED.A.2, NJSLS-F-IF.B.4, NJSLS-F-IF.C.7a, NJSLS-F-LE.B.5*	Algebra 1 Foundations Series Text p. 317-319 #1-28 *Teacher created resources using Kuta software or other supplemental material. IXL: 4Q5, ZAC
3.5	Graphing Linear Equations in Slope-Intercept Form	*NJSLS-A-CED.A.2, NJSLS-F-IF.B.4, NJSLS-F-IF.C.7a, NJSLS-F-LE.B.5*	Big Ideas Text p. 141-144 #1-42, 45, 48, 50-52 Algebra 1 Foundations Series Text p. 335-337 #1-20, 24 IXL: U55, W5E
3.7	Graphing Absolute Value Functions	*NJSLS-A-CED.A.2, NJSLS-A-REI.D.10, NJSLS-F-IF.C.7b, NJSLS-F-BF.B.3*	Big Ideas Text p. 160-162 #1-41, 44- 46, 49, 55-59, 61 Algebra 1 Foundations Series Text p. 275 #22-24, 28,30 IXL: TD2, 23W

Chapter 4 – Writing Linear Functions (Test 4.1-4.3)

Section	Title	NJSLS	Problems

4.1	Writing Equations in Slope-Intercept Form	*NJSLS-A-CED.A.2, NJSLS-F-BF.A.1a, NJSLS-F-LE.A.1b, NJSLS-F-LE.A.2*	Big Ideas Text p. 179-180 #1-26, 31, 32, 35 Algebra 1 Foundations Series Text p. 331-333 #1-33, 40-41 IXL: A42, 9GV, SSE
4.2	Writing Equations in Point-Slope Form	*NJSLS-A-CED.A.2, NJSLS-F-BF.A.1a, NJSLS-F-LE.A.1b, NJSLS-F-LE.A.2*	Big Ideas Text p. 185-186 #1-20, 27-32 Algebra 1 Foundations Series Text p. 340 #1,2,4,5,18; p.342-344 1-13 IXL: PPE, LBX
*Supplement 4.3	Writing Equations in Standard Form Writing Equations of Parallel and Perpendicular Lines	*NJSLS-A-CED.A.2, NJSLS-F-BF.A.1a, NJSLS-F-LE.A.1b, NJSLS-F-LE.A.2* *NJSLS-A-CED.A.2, NJSLS-F-LE.A.2*	Teacher created resources using Kuta software or other supplemental material. Big Ideas Text p. 191-192 #1-24 even, 25-28 Algebra 1 Foundations Series Text p. 360-362 #1-16, 22-31 IXL: PRP, 58L

Marking Period 3

Chapter 5 – Solving Systems of Linear Equations (Test 5.1-5.4, 5.6-5.7)

Section	Title	NJSLS	Problems
5.1	Solving Systems of Linear Equations by Graphing	*NJSLS-A-CED.A.3, NJSLS-A-REI.C.6*	Big Ideas Text p. 239-240 #1-28, 31, 32, Algebra 1 Foundations Series Text p. 385-387 #1-16, 18-33 IXL: WV5, TSS
5.2	Solving Systems of Linear Equations by Substitution	*NJSLS-A-CED.A.3, NJSLS-A-REI.C.6*	Big Ideas Text p. 245-246 #1-20, 25, 26, 30, 32 Algebra 1 Foundations Series Text p. 393-395 #1-28 IXL: J8X, BW5

5.3	Solving Systems of Linear Equations by Elimination	*NJSLS-A-CED.A.3, NJSLS-A-REI.C.5, NJSLS-A-REI.C.6*	Big Ideas Text p. 251-252 #1-26, 29 Algebra 1 Foundations Series Text p. 397-398 #1-21; p. 402-404 #1-16 IXL: ZQV, A48
5.4	Solving Special Systems of Linear Equations	*NJSLS-A-CED.A.3, NJSLS-A-REI.C.6*	Big Ideas Text p. 257-258 #1-25, 29, 30 IXL: UYM
5.6	Graphing Linear Inequalities in Two Variables	*NJSLS-A-CED.A.3, NJSLS-A-REI.D.12*	Big Ideas Text p. 271-272 #1-38, 40 Algebra 1 Foundations Series Text p. 418-419 #1-25; p. 422-424 #1-21 IXL: HHP

5.7 Systems of Linear Inequalities *NJSLS-A-CED.A.3, NJSLS-A-REI.D.12*

Big Ideas Text p. 402-403 #1-30

Sequences (Test 6.1, 6.3)

Algebra 1 Foundations Series Text p. 428-430 #1-22

IXL: KS6

Chapter 6 – Exponential Functions and

Section	Title NJSLS		Problems
6.1	Properties of Exponents *NJSLS-N-RN.A.2*		Big Ideas Text p. 296-298 #1-44, 47- 50 Algebra 1 Foundations Series Text p. 446-447 #1-39; p. 458-459 #1-40; p. 464-465 #1-45; p. 471-472 # 1-52 IXL: LNK
6.3	Exponential Functions	*NJSLS-A-CED.A.2, NJSLS F-IF.B.4, NJSLS-F IF.C.7e, NJSLS-F-LE.A.1a, NJSLS-F-LE.A.2*	Big Ideas Text p. 310-312 #1-24, 42, 55,58 Algebra 1 Foundations Series Text p. 478-479 #1-25

		IXL: BYF, ANC

Chapter 7 – Polynomial Equations and Factoring (Test 7.1-7.3)

Section	Title NJSLS	Problems
7.1	Adding and Subtracting Polynomials *NJSLS.A.APR.A.1, NJSLS.F.IF.C.7c*	Big Ideas Text p. 362 #1-4, 6-18 even, 22-46 even Algebra 1 Foundations Series Text p. 505-507 #1-39 IXL: W75, 9A3
7.2	Multiplying Polynomials *NJSLS.A.APR.A.1*	Big Ideas Text p. 369 # 1, 4-24 even, 28,30 Algebra 1 Foundations Series Text p. 511-512 #1, 9-15, 29-37; p. 516 #1-21; p. 519-520 #1-13, 16-20 IXL: G2G, JB7
7.3	Special Products of Polynomials *NJSLS.A.APR.A.1*	Big Ideas Text p. 375 # 4-10 even, 16, 18, 22, 34 Algebra 1 Foundations Series Text p. 525-526 #1-14, 22-27, 32-40 IXL: 8GN

Marking Period 4

Chapter 7 – Polynomial Equations and Factoring (Test 7.4-7.8)

Section	Title NJSLS	Problems
7.4	Solve Polynomial Equations in Factored Form *NJSLS.A.CED.A.1, NJSLS.F.IF.C.8a*	Big Ideas Text p. 381 # 2-8, 10-16 even, 26-38 even, 41 Algebra 1 Foundations Series Text p. 587-89 #1, 8-12, 23 IXL: TNM
7.5	Factoring $x^2 + bx + c$ *NJSLS.A.CED.A.1, NJSLS.A.REI.B.4b, NJSLS.F.IF.C.8a*	Big Ideas Text p. 389 #1, 4-26 even, 30-38 even, 39 Algebra 1 Foundations Series Text p. 535-537 #1- 29 IXL: S9P

7.6 7.7 7.8	Factoring $ax^2 + bx + c$ Factoring Special Products Factoring Polynomials Completely	*NJSLS.A.SSE.B.3, NJSLS.A.CED.A.1, NJSLS.A.REI.B.4b, NJSLS.F.IF.C.8a* *NJSLS.A.SSE.B.3, NJSLS.A.APR.C.4, NJSLS.A.CED.A.1, NJSLS.A.REI.B.4b* *NJSLS.A.SSE.B.3, NJSLS.A.CED.A.1, NJSLS.A.REI.B.4b*	Big Ideas Text p. 395 #1, 4-28 even, 33 Algebra 1 Foundations Series Text p. 541-542 #1-27 IXL: 7ED Big Ideas Text p. 401 #1, 4-8 even, 16-22 even, 26-32 even, 36-40 even Algebra 1 Foundations Series Text p. 548-549 #1-38 IXL: 56E Big Ideas Text p. 407 #1, 4-32 even, 38, 40 Algebra 1 Foundations Series Text p. 553-554 #1-21 IXL: HAA

Chapter 9 – Solving Quadratic Equations (Test 9.2-9.5)

Section	Title NJSLS	Problems
9.2	Solving Quadratic Equations by Graphing *NJSLS.A.CEDA.2, NJSLS.A.CED.A.3, NJSLS.A.REI.D.11, NJSLS.F.IF.B.4, NJSLS.F.IF.C.7a, NJSLS.F.IF.C.7c, NJSLS.F.IF.C.8a*	Big Ideas Text p. 494 #2-4, 6-36 even, 53, 54 Algebra 1 Foundations Series Text p. 569-571 #1-15, 20-23; p. 576-577 #1-15; p. 582 # 8-16
9.3 Solving Quadratic Equations Using Square Roots	*NJSLS.A.CED.A.1, NJSLS.A.CED.A.2, NJSLS.A.CED.A.3, NJSLS.REI.B.4b, NJSLS.A.REI.D.11* *NJSLS.A.SSE.B.3, NJSLS.A.CED.A.1, NJSLS.F.IF.C.8a, NJSLS.A.REI.B.4a*	Big Ideas Text p. 501 #1, 2-30 even, Big Ideas Text p. 511 #17-22, 25, 26, 33 Algebra 1 Foundations Series Text p. 598-599 #1-22 IXL: XCL Big Ideas Text p. 521 #1, 4-22 even, 38-44
9.4 Solving Quadratic Equations by Completing the Square	*NJSLS.A.REI.B.4b* 32,33	Algebra 1 Foundations Series Text p. 605-606 #1-3, 7-22 IXL: XCF
9.5 Solving Quadratic Equations Using the Quadratic Formula	Algebra 1 Foundations Series Text p. 582 #17-31 IXL: ERE	

Chapter 10 Radical Functions and Equations (Test 10.1, 10.3)

Section	Title NJSLS Problems	
10.1	Graphing Square Root Functions *NJSLS.F.IF.C.7b, NJSLS.F.BF.B.3*	Big Ideas Text p. 548 #1-2, 21-25, 29, 30, 35, 38-44 even IXL: VWK
10.3	Solving Radical Equations *NJSLS.A.REI.A.2*	Big Ideas Text p. 564 #1, 2-32 even, 51-59 odd, 72 Algebra 1 Foundations Series Text p. 649-650 #1-23 IXL: ZGH

Grading Scale

50% Homework, classwork, binder/notebook, projects
30% Warm ups, class participation, technology activities
20% Quizzes, Tests

Course Expectations and Skills

- Students are required to take notes and maintain those notes in a neat and organized notebook/binder.
- Students are required to participate actively in class discussions and group work.
- Students will learn by doing, not just watching.
- Students should expect that there will be concepts that are not grasped immediately. Learn to be persistent in thinking and problem solving.
- Students should ask questions during discussion, within a group setting, or individually.
- Students are required to complete homework assignments daily.
- Students should seek help from teachers and other resources.

Resources

Text Book: *Algebra 1,* Big Ideas Math

Supplemental Materials: Algebra 1 Practice Workbook
Dynamic Algebra Software
Algebra 1 Foundations Series Text
Kuta Infinite Algebra 1
IXL

Black Horse Pike Regional School District Curriculum

ENGAGING STUDENTS ⚫ FOSTERING ACHIEVEMENT ⚫ CULTIVATING 21ST CENTURY GLOBAL

SKILLS **Course Name: Algebra 1 Foundations - Course Number: 113120**

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course Title: Algebra 1 / Solving Linear Equations	**Unit Summary**: In this unit, students will explore the foundational skills related to solving linear equations and the connected skills of solving absolute value equations and rewriting equations and formulas. Most students will have prior experience with the Properties of Equality and techniques presented in the first three sections. It will sound familiar that whatever operation is performed on one side of the equations, the same operations must be performed on the other side of the equations to keep equality, or balance. The fourth section of the chapter applies the techniques of equation solving to the context of absolute value equations. Understanding absolute value as a function concept and not simply two vertical lines can be challenging for students. Solving literal equations in the last section requires students to see the structure of equations and perform operations on variable terms as they would perform operations on constants. Essential to success in this chapter is accuracy in computation.
Grade Level: 10	
Essential Question(s): • How can you use simple equations to solve real-life problems? • How can you use multistep equations to solve real-life problems? • How can you solve an equation that has variables on both sides? • How can you solve an absolute value equation? • How can you use a formula for one measurement to write a formula for a different measurement?	**Enduring Understanding(s):** Students will be able to: • Solve simple equations. • Solve multi-step equations. • Solve equations with variables on both sides. • Solve absolute value equations. • Rewrite literal equations. • Rewrite formulas.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable Learning Target NJSLS: 1. Solve multi-step equations and equations with variables on both sides. 1. *NJSLS-A-CED.A.1,*

[*Standard*] - Create equations and inequalities in one variable and use them to solve problems.

[*Standard*] - 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.

[*Standard*] - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

[*Standard*] - Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

NJSLS-A-REI.A.1, NJSLS-A-REI.B.3, NJSLS-N-Q.A.1,

[*Standard*] - Create equations and inequalities in one variable and use them to solve problems.

[*Standard*] - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

3. Rewrite literal equations and formulas.

[*Standard*] - Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving

2. Solve absolute value equations. 2. *NJSLS-A-CED.A.1,* equations.

Inter-Disciplinary Connections:

NJSLS-A-REI.B.3 **3.** *NJSLS-A-CED.A.4*

Real-World problem solving examples: Olympic Runners (p. 6), Temperatures (p. 7), Amusement Parks (p. 8), Floor Mats (p. 9), CD Costs (p. 9), Club Profits (p. 15), Car Repairs (p. 16), Summer Earnings (p. 17), Pool Depth (p. 17), Flags (p. 17), Boat Speeds (p. 22), Movie Rentals (p. 23), Internet Fees (p. 23), Distance to the Sun (p. 32), Irrigation System (p. 37), Temperature (p. 38), Truck Driving (p. 39), Sale Price (p. 41), Interest Rates (p. 41)

Inter-Disciplinary problem solving examples: Investments (p. 9), Batting Averages (p. 10), Biking (p. 14), Tennis (p. 17), Cheerleading (p. 29), Soccer (p. 33), Football (p. 41), Physics (p. 41)

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*
- Algebra 1, Foundations, *Pearson Education Inc., 2015*

Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
- Desmos – online graphing tool
- IXL – web-based software
- G Suite for education – Google Classroom, Docs, Drive, Mail, etc…

Calculators:

- TI – 84 Plus graphing calculator
- TI – 30 XS MultiView

The following 21st century skills and the 8 mathematical practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments and projects:

21st Century skills:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Information literacy
- Technology literacy
- Media literacy
- Flexibility
- Leadership
- Initiative
- Productivity
- Social skills

Mathematical Practices:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

Students will write:

Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands-on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 1.1 Solving Simple Equations:

Warm-up/Starting Options	**Explorations p. T-3**
Practice and Apply	**p. 8-10 #1-47** **Algebra 1 Foundations Series Text p. 91-93 #1-47**
Resources	**Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **IXL:Level H Z.8 Solve one-step addition and subtraction equations with whole numbers - Shortcut - JXM** **Level H Z.9 Solve one-step multiplication and division equations with whole numbers - Shortcut - JUA** **Level H Z.10 Solve one-step equations with whole numbers - Shortcut - WLR**

Assess and Reteach **Differentiating Instruction**	**● Mini Assessment: TE p. 10 ● Practice A and Practice B ● Puzzle Time** **● Student Journal** **● Skills Review Handbook**

Section 1.2 Solving Multi-Step Equations:

Warm-up/Starting Options	**Explorations p. T-11**
Practice and Apply - Two-Step Equations **Practice and Apply - Multi-step Equations**	**p. 16 #3-10, 35** **Algebra 1 Foundations Series Text p. 97-99 #1-33, 40-47** **p. 16-18 #11-44, 49, 57-65** **Algebra 1 Foundations Series Text p. 103 -104 #1-30**
Resources	**Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **IXL: Level H Z.19 Solve equations involving like terms - Shortcut - W82**

	Level H Z.20 Solve two-step equations - Shortcut - QVK **Level J Y.15 Solve multi-step equations - Shortcut - 55K**
Assess and Reteach **Differentiating Instruction**	**● Mini Assessment: TE p. 18** **● Practice A and Practice B** **● Puzzle Time** **● Student Journal** **● Skills Review Handbook**

Section 1.3 Solving Equations with Variables on Both Sides:

Warm-up/Starting Options	**Explorations p. T-19**
Practice and Apply	**p. 23-24 #1-30, 33, 38** **Algebra 1 Foundations Series Text p. 1114-116 #1-28, 35-39**
Resources	**Online Dynamic Classroom has all resources available. Review: Practice 33 odd A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Real Life STEM Video: Dead Reckoning IXL: Level J Y.12 Solve equations with variables on both sides - Shortcut - ZYL Level K J.6 Solve linear equations with variables on both sides - 7S7**
Assess and Reteach **Differentiating Instruction**	● **Mini Assessment: TE p. 24** ● **Practice A and Practice B** ● **Puzzle Time** ● **Student Journal** ● **Skills Review Handbook**

Section 1.4 Solving Absolute Value Equations:

Warm-up/Starting Options Explorations p. T-27

Practice and Apply p. 32-34 #1-25, 49-50

Algebra 1 Foundations Series Text p. 224-225 #1-22, 30,33

Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,
Student Journal, and Skills Review Handbook
IXL: Level K L.1 Solve absolute value equations -Shortcut - 9LF
Level M B.4 Solve absolute value equations - Shortcut - 2JZ

Assess and Reteach

- **Mini Assessment: TE p. 34**

Differentiating Instruction

- **Practice A and Practice B**
- **Puzzle Time**
- **Student Journal**
- **Skills Review Handbook**

Section 1.5 Rewriting Equations and Formulas:

Warm-up/Starting Options Explorations p. T-35

Practice and Apply p. 40-42 #1-28, 38

Algebra 1 Foundations Series Text p. 120-122 #1-10, 19-24, 25-32

Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,
Student Journal, and Skills Review Handbook
IXL:Level K I.11 Rearrange multi-variable equations - Shortcut - WSJ

Assess and Reteach

- **Mini Assessment: TE p. 42**

Differentiating Instruction

- **Practice A and Practice B**
- **Puzzle Time**
- **Student Journal**
- **Skills Review Handbook**

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 numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student recordkeeping, quizzes, exit/entrance assignments, peer/self-assessments, learning/response logs, discussions

and practice presentations.

Summative Assessments:

The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Algebra Foundations curriculum/syllabus at the conclusion of an instructional time period.

- Diagnostic Pre-Test
- Chapter Tests
- Standardized Tests
- Standard Related Projects

Performance Assessments:

Performance Tasks, Projects

Accommodations/Modifications:

As per IEP.

Black Horse Pike Regional School District Curriculum

ENGAGING STUDENTS ⚫ FOSTERING ACHIEVEMENT ⚫ CULTIVATING 21ST CENTURY GLOBAL SKILLS **Course Name: Algebra 1 Foundations - Course Number: 113120**

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course Title: Algebra 1 / Solving Linear Inequalities	**Unit Summary**: In this unit, students will apply the techniques used in solving linear equations to solving linear inequalities. The chapter begins with an introduction to writing and graphing inequalities. Color coding and verbal models are used to help students develop confidence in writing inequalities, a necessary skill for the chapter. The graphs are used to display and check solutions. The next three lessons focus on solving increasingly complex inequalities. Tools used in developing facility with these problems include symbolic manipulation, tables, and spreadsheets. Practice with real number operations is integrated throughout. The last two lessons of the chapter introduce compound inequalities, which are necessary in solving absolute value inequalities.
Grade Level: 10	

Essential Question(s):	**Enduring Understanding(s):**
• How can you use an inequality to describe a real-life statement? • How can you use addition or subtraction to solve an inequality? • How can you use division to solve an inequality? • How can you solve a multi-step inequality? • How can you use inequalities to describe intervals on the real number line? • How can you solve an absolute value inequality?	Students will be able to: • Write linear inequalities. • Sketch the graphs of linear inequalities. • Write linear inequalities from graphs. • Solve inequalities using addition. • Solve inequalities using subtraction. • Use inequalities to solve real-life problems. • Solve inequalities by multiplying or dividing by positive numbers. • Solve inequalities by multiplying or dividing by negative numbers. • Solve multi-step inequalities. • Use multi-step inequalities to solve real-life problems. • Write and graph compound inequalities. • Solve compound inequalities. • Use compound inequalities to solve real-life problems. • Solve absolute value inequalities. • Use absolute value inequalities to solve real-life problems.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

Learning Target	**NJSLS:**
1. Solve and graph multi-step inequalities. [*Standard*] - Create equations and inequalities in one variable and use them to solve problems. [*Standard*] - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	**1.** *NJSLS-A-CED.A.1, NJSLS-A-REI.B.3,*
2. Solve and graph compound inequalities. [*Standard*] - Create equations and inequalities in one variable and use them to solve problems. [*Standard*] - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	**2.** *NJSLS-A-CED.A.1, NJSLS-A-REI.B.3*
3. Solve and graph absolute value inequalities. [*Standard*] - Create equations and inequalities in one variable and use them to solve problems. [*Standard*] - Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.	**3.** *NJSLS-A-CED.A.1, NJSLS-A-REI.B.3*

Interdisciplinary Connections:

Real-World problem solving examples: Height Restrictions (p. 57), Fishing (p. 58), Pool Temperature (p. 59), Maximum Vehicle Weight (p. 59), Subway Cost (p. 60), Circuits (p. 64), Luggage Weight (p. 65), Free Shipping (p. 65), Summer Jobs (p. 70), Buying Fish (p. 71), Temperature (p. 71), New Carpet (p. 71), Game Scores (p. 76), Account Balance (p. 77), Campground (p. 78), Fire Trucks (p. 78), Car Wash (p. 78), Electronic Devices (p. 84), Mountain Elevation (p. 85), Body Temperature (p. 91), Auto Parts (p. 91)

Interdisciplinary problem solving examples: Weight Lifting (p. 59), Bridge Building (p. 59), Hockey (p. 65), Woodworking (p. 78), Track Times (p. 78), Marine Biology (p. 85), Essay Contest (p. 91), Physics (p. 91)

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*
- Algebra 1, Foundations, *Pearson Education Inc., 2015*

Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
- Desmos – online graphing tool
- IXL – web-based software
- G Suite for education – Google Classroom, Docs, Drive, Mail, etc…

Calculators:

- TI – 84 Plus graphing calculator
- TI – 30 XS MultiView

The following 21st century skills and the 8 mathematical practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments and projects:

21st Century skills:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Information literacy • Technology literacy • Media literacy
- Flexibility
- Leadership
- Initiative
- Productivity
- Social skills

Mathematical Practices:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

Students will write:

Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands-on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 2.1 Writing and Graphing Linear Inequalities:

Warm-up/Starting Options	**Explorations p. T-53**
Practice and Apply	**p. 58-60 #1-46, 48-52** **Algebra 1 Foundations Series Text p. 176-177 #1-28; p. 180-182 # 1-34**
Resources	**Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **IXL: Level I T.3 Write inequalities from number lines - Shortcut - JNL** **Level H AA.2 Graph inequalities on number lines - Shortcut - CXX**

Section 2.2 Solving Inequalities Using Addition or Subtraction:

Warm-up/Starting Options	**Explorations p. T-61**
Practice and Apply	**p. 65-66 #1-35, 39-46** **Algebra 1 Foundations Series Text p. 187-188 #1-52**
Resources	**Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **Real Life STEM Video: Planning Electrical Circuits** **IXL: Level K K.4 Solve one-step linear inequalities: addition and subtraction - Shortcut - RZV**

Section 2.3 Solving Inequalities Using Multiplication or Division:

Warm-up/Starting Options	Explorations p. T-67
Practice and Apply	p. 71-72 #1-34, 40-43 Algebra 1 Foundations Series Text p. 194-196 #1-32, 40-50
Resources	Online Dynamic Classroom has all resources available. Review: Practice 33 odd A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook IXL: Level K K.5 Solve one-step linear inequalities: multiplication and division - Shortcut - BRJ

Section 2.4 Solving Multi-Step Inequalities:

Warm-up/Starting Options Explorations p. T-73

Practice and Apply p. 77-78 #1-34

Algebra 1 Foundations Series Text p. 202-204 #1-39

Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,
Student Journal, and Skills Review Handbook
IXL:Level J Z.8 Solve multi-step inequalities -Shortcut - 6AZ

Section 2.5 Solving Compound Inequalities:

Warm-up/Starting Options Explorations p. T-81

Practice and Apply p. 85-86 #1-23, 25-32

Algebra 1 Foundations Series Text p. 219-220 #1-23,28

Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,
Student Journal, and Skills Review Handbook
IXL:Level K K.14 Solve compound inequalities - Shortcut - GXA

Section 2.6 Solving Absolute Value Inequalities:

Warm-up/Starting Options Explorations p. T-87

Practice and Apply p. 91-92 #1-17, 19, 21

Algebra 1 Foundations Series Text p. 228 #1-22

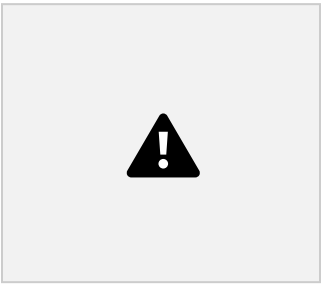
Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,
Student Journal, and Skills Review Handbook
IXL: Level K L.3 Solve absolute value inequalities - Shortcut - HXH
Level M C.6 Solve absolute value inequalities - Shortcut - UKU

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 numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student recordkeeping, quizzes, exit/entrance assignments, peer/self-assessments, learning/response logs, discussions and practice presentations.

Summative Assessments:

The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Algebra Foundations curriculum/syllabus at the conclusion of an instructional time period.

- Diagnostic Pre-Test
- Chapter Tests
- Standardized Tests
- Standard Related Projects

Performance Assessments:

Performance Tasks, Projects

Accommodations/Modifications:

As per IEP.

Black Horse Pike Regional School District Curriculum

ENGAGING STUDENTS ⚫ FOSTERING ACHIEVEMENT ⚫ CULTIVATING 21ST CENTURY GLOBAL SKILLS **Course Name: Algebra 1 Foundations - Course Number: 113120**

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course Title:	**Unit Summary**:
Algebra 1 / Graphing Linear Functions	In this unit, students will expand on their conceptual understanding of functions. Their understanding may be of a "function machine" where there is an input, a function is performed, and an output results. There is a pairing of the input and output, and each input is associated with exactly one output.

Grade Level: 10	This chapter extends this introductory understanding of functions and presents the notation of functions. Consistent use of the notation and language of functions will help students become more confident. The early part of the chapter focuses on function notation, representing functions, discrete and continuous functions, and evaluating functions. Students may be resistant to using function notation, preferring the simpler "*y* =" notation. It is hard for students to appreciate what the broader notation enables us to do because they have not learned enough at this stage. When two equations are graphed on the same axes, we can clearly refer to *f* and *g*, versus saying "the first *y* =" and "the second *y* =". We compose functions and have functions with multiple inputs, two examples where function notation is useful. The middle portion of the chapter introduces two forms of linear equations – standard and slope intercept. The last lesson of the chapter looks at absolute value functions.
Essential Question(s): • What is a function? • How can you determine whether a function is linear or nonlinear? • How can you use function notation to represent a function? • How can you describe the graph of the equation $Ax + By = C$? • How can you describe the graph of the equation $y = mx + b$? • How do the values of *a*, *h*, and *k* affect the graph of the absolute value function?	**Enduring Understanding(s):** Students will be able to: • Determine whether relations are functions. • Find the domain and range of a function. • Identify the independent and dependent variables of a function. • Identify linear functions using graphs, tables, and equations. • Graph linear functions using discrete and continuous data. • Write real-life problems to fit data. • Use function notation to evaluate and interpret functions. • Use function notation to solve and graph functions. • Graph equations of horizontal and vertical lines. • Graph linear equations in standard form using intercepts. • Find the slope of a line. • Use the slope-intercept form of a linear equation. • Translate graphs of absolute value functions. • Stretch, shrink, and reflect graphs of absolute value functions.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

Learning Target	**NJSLS:**
1. Use function notation. [*Standard*] - 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 f is the graph of the equation y = f(x). [*Standard*] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [*Standard*] - 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). [*Standard*] - Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. [*Standard*] - Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. [*Standard*] - Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. [*Standard*] - Graph linear and quadratic functions and show intercepts, maxima, and minima. [*Standard*] - Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).	**1.** *NJSLS-F-IF.A.1, NJSLS-A-CED.A.2, NJSLS-A-REI.D.10, NJSLS-F-IF.B.5, NJSLS-F-LE.A.1b, NJSLS-F-IF.A.2 NJSLS-F-IF.C.7a, NJSLS-F-IF-C.9*
2. Graph linear equations. [*Standard*] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [*Standard*] - Graph linear and quadratic functions and show intercepts, maxima, and minima. [*Standard*] - 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. [*Standard*] - Interpret the parameters in a linear or exponential function in terms of a context.	**2.** *NJSLS-A-CED.A.2, NJSLS-F-IF.C.7a, NJSLS-F-IF.B.4, NJSLS-F-LE.B.5*
3. Graph absolute value functions. [*Standard*] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [*Standard*] - 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). [*Standard*] - Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.	**3.** *NJSLS-A-CED.A.2, NJSLS-A-REI.D.10, NJSLS-F-IF.C.7b*

Interdisciplinary Connections:

Real-World problem solving examples: Bottled Juice (p. 107), Taxi Fare (p. 109), Vending Machines (p. 109), Calories (p. 115), Book Cost (p. 118), Dog Grooming (p. 119), Car Rental (p. 119), Helicopter Rides (p. 124), Restaurant Customers (p. 125), Internet Use (p. 125), Orchestra Tickets (p.125), Laptop Batteries (p. 126), Awards Banquet (p. 132), Buying Shirts (p. 133), Class Trip (p. 134), Submarine Ascent (p. 140), Snow Depth (p. 142), Truck Rental (p. 142), Selling Shoes (p. 161), Playing Pool (p. 161), Computer Games (p. 162)

Interdisciplinary problem solving examples: Physics (p. 110), Rock Climbing (p. 119), Speed of Light (p. 125), Construction (p. 126), Football Game (p. 133), Basketball (p. 134), Farming (p. 142)

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*
- Algebra 1, Foundations, *Pearson Education Inc., 2015*

Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
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- G Suite for education – Google Classroom, Docs, Drive, Mail, etc…

Calculators:

- TI – 84 Plus graphing calculator
- TI – 30 XS Multiview

The following 21st century skills and the 8 mathematical practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments and projects:

21st Century skills:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Information literacy • Technology literacy • Media literacy
- Flexibility
- Leadership
- Initiative
- Productivity
- Social skills

Mathematical Practices:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

Students will write:

Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

<u>How</u> will students uncover content and build skills?

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands-on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 3.1 Functions:

Warm-up/Starting Options	**Explorations p. T-103**
Practice and Apply	**p. 108-110 #1-24** **Algebra 1 Foundations Series Text p. 251-254 #1-18**
Resources	**Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **IXL: Level N A.2 Identify functions - Shortcut-QTA Level J BB.25 Domain and range of functions - Shortcut - JZD**

Section 3.2 Linear Functions:

Warm-up/Starting Options Explorations p. T-111	
Practice and Apply p. 117-120 #1-34, 36, 38	**Algebra 1 Foundations Series Text p. 258-260 #1-18**
Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,	**Student Journal, and Skills Review Handbook** **IXL: Level K T.1 Identify linear functions from graphs and equations - Shortcut - VMQ Level K T.2 Identify linear functions from tables - Shortcut - F5G**

Section 3.3 Function Notation:

Warm-up/Starting Options	**Explorations p. T-121**

Practice and Apply **Resources**	**p. 125-126 #1-22** **Algebra 1 Foundations Series Text p. 274-276 #1-21** **Online Dynamic Classroom has all resources available. Review: Practice 33 odd A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Real Life STEM Video: Speed of Light** **IXL: Level J BB.9 Evaluate a linear function - Shortcut - LNV** **Level J BB.11 Complete a table and graph a linear function - Shortcut - DC2**

Section 3.4 Graphing Linear Equations in Standard Form:

Warm-up/Starting Options Explorations p. T-129

Practice and Apply p. 133-134 #1-35

Algebra 1 Foundations Series Text p. 353-356 #1-29, 35-36

Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,
Student Journal, and Skills Review Handbook
IXL: Level K T.19 Standard form: find x- and y-intercepts -Shortcut - 8SN
Level J AA.13 Graph a line from an equation in standard form- Shortcut - 7MZ

Section 3.5 Graphing Linear Equations in Slope-Intercept Form:

Warm-up/Starting Options Explorations p. T-135

Practice and Apply p. 141-144 #1-42, 45, 48, 50-52

Algebra 1 Foundations Series Text p. 335-337 #1-20, 24

Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,
Student Journal, and Skills Review Handbook
IXL:Level J AA.4 Slope-intercept form: find the slope and y-intercept - Shortcut - U55
Level J AA.6 Graph a line from an equation in slope-intercept form- Shortcut - W5E

Section 3.7 Graphing Absolute Value Functions:

Warm-up/Starting Options Explorations p. T-155

Practice and Apply p. 160-162 #1-41, 44-46, 49, 55-59, 61 Algebra 1 Foundations Series Text p. 275 #22-24, 28,30

Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,
Student Journal, and Skills Review Handbook
IXL: Level K EE.2 Graph an absolute value function - Shortcut - TD2
Level M D.13 Graph an absolute value function - Shortcut - 23W

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 numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student recordkeeping, quizzes, exit/entrance assignments, peer/self-assessments, learning/response logs, discussions and practice presentations.

Summative Assessments:

The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Algebra Foundations curriculum/syllabus at the conclusion of an instructional time period.

- Diagnostic Pre-Test
- Chapter Tests
- Standardized Tests
- Standard Related Projects

Performance Assessments:

Performance Tasks, Projects

Accommodations/Modifications:

As per IEP.

Black Horse Pike Regional School District Curriculum

ENGAGING STUDENTS ⚫ FOSTERING ACHIEVEMENT ⚫ CULTIVATING 21ST CENTURY GLOBAL SKILLS **Course Name: Algebra 1 Foundations - Course Number: 113120**

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course Title:	**Unit Summary**:
Algebra 1 / Writing Linear Functions	In this unit, students begin writing linear equations in slope-intercept form, point-slope form, and standard form. These forms are extended in

Grade Level: 10	the next lesson to include the cases of parallel and perpendicular lines.
Essential Question(s): • Given the graph of a linear function, how can you write an equation of the line? • How can you write the equation of a line when you are given the slope and a point on the line? • How can you recognize lines that are parallel or perpendicular?	**Enduring Understanding(s):** Students will be able to: • Write equations in slope-intercept form. • Use linear equations to solve real-life problems. • Write an equation of a line given its slope and a point on the line. • Write an equation of a line given two points on the line. • Use linear equations to solve real-life problems. • Identify and write equations of parallel lines. • Identify and write equations of perpendicular lines. • Use parallel and perpendicular lines in real-life problems.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

Learning Target	**NJSLS:**
1. Write linear equations. [*Standard*] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [*Standard*] - Determine an explicit expression, a recursive process, or steps for calculation from a context. [*Standard*] - Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. [*Standard*] - 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).	**1.** *NJSLS-A-CED.A.2, NJSLS-F-BF.A.1a, NJSLS-F-LE.A.1b, NJSLS-F-LE.A.2*

2. Use linear equations to represent real-life situations. [*Standard*] - Determine an explicit expression, a recursive process, or steps for calculation from a context. [*Standard*] - Recognize situations in which one quantity changes at a constant rate per unit interval relative to another. [*Standard*] - 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). **3. Write the equations of lines parallel or perpendicular to a given line.** [*Standard*] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. [*Standard*] - 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).	**2.** *NJSLS-F-BF.A.1a, NJSLS-F-LE.A. 1b, NJSLS-F-LE.A.2* **3.** *NJSLS-A-CED.A.2, NJSLS-F-LE.A.2*

Interdisciplinary Connections:

Real-World problem solving examples: World Records (p. 180), Music Studio (p. 180), Box Office Revenue (p. 180), Student Council (p. 184), Internet Service Fees (p. 184), Band Advertisement (p. 186), Beach House Rental (p. 186), Weekly Allowance (p. 186), Bike Paths (p. 192), Registration Fees (p. 192)

Interdisciplinary problem solving examples: Renewable Energy (p. 178), Aviation and Flight Paths (p. 190), Construction (p. 192), Hockey (p. 192)

Students will engage with the following text, resources and tools:

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literacy
• Flexibility
• Leadership
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• Productivity
• Social skills

• Make sense of problems and persevere in solving them
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• Model with mathematics
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Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

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How will students uncover content and build skills?

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Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 4.1 Writing Equations in Slope-Intercept Form:

Warm-up/Starting Options	**Explorations p. T-175**
Practice and Apply	**p. 179-180 #1-26, 31, 32, 35** **Algebra 1 Foundations Series Text p. 331-333 #1-33, 40-41**
Resources	**Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **Real Life STEM Video: Future Wind Power** **IXL: Level K T.9 Slope-intercept form: write an equation - SHortcut - A42** **Level K T.8 Slope-intercept form: write an equation from a graph - Shortcut - 9GW** **Level K T.10 Slope-intercept form: write an equation from a table - Shortcut - SSE**

Section 4.2 Writing Equations in Point-Slope Form:

Warm-up/Starting Options	**Explorations p. T-181**
Practice and Apply	**p. 185-186 #1-20, 27-32** **Algebra 1 Foundations Series Text p. 340 #1,2,4,5,18; p.342-344 1-13**
Resources	**Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **IXL: Level K T.24 Point-slope form: write an equation -Shortcut - PPE** **Level K T.25 Point-slope form: write an equation from a graph - Shortcut - LBX**

Section 4.3 Writing Equations of Parallel and Perpendicular Lines:

Warm-up/Starting Options	**Explorations p. T-187**
Practice and Apply	**p. 191-192 #1-24 even, 25-28** **Algebra 1 Foundations Series Text p. 360-362 #1-16, 22-31**

Resources	**OnlineDynamicClassroomhasall resourcesavailable. Review:Practice33oddAandPracticeB,PuzzleTime, StudentJournal,andSkillsReviewHandbook IXL:** **Level J AA.16 Slopes of parallel and perpendicular lines - Shortcut - PRP** **Level I W.15 Parallel, perpendicular, and intersecting lines- Shortcut - 58L**

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- Chapter Tests
- Standardized Tests
- Standard Related Projects

Performance Assessments:

Performance Tasks, Projects

Accommodations/Modifications:

As per IEP.

Black Horse Pike Regional School District Curriculum

ENGAGING STUDENTS ⚫ FOSTERING ACHIEVEMENT ⚫ CULTIVATING 21ST CENTURY GLOBAL SKILLS **Course Name: Algebra 1 Foundations - Course Number: 113120**

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course Title: Algebra 1 / Solving Systems of Linear Equations	**Unit Summary**: In this unit, students will study the three common techniques for solving a system of equations: graphing, substitution, and elimination. These techniques are presented in the first three sections of this chapter. Students are introduced to the definition of a linear system, and they learn to check their solutions. The fourth section looks at special linear systems, where there is no solution because the lines are parallel or there are infinitely many solutions because the lines coincide. The last lessons combine prior skills to allow students to graph systems of linear inequalities.
Grade Level: 10	

Essential Question(s):	Enduring Understanding(s):
• How can you solve a system of linear equations? • How can you use substitution to solve a system of linear equations? • How can you use elimination to solve a system of linear equations? • Can a system of linear equations have no solution or infinitely many solutions? • How can you graph a linear inequality in two variables? • How can you graph a system of linear inequalities?	Students will be able to: • Check solutions of systems of linear equations. • Solve systems of linear equations by graphing. • Use systems of linear equations to solve real-life problems. • Solve systems of linear equations by substitution. • Solve systems of linear equations by elimination. • Determine the number of solutions of linear systems. • Use linear systems to solve real-life problems. • Check solutions of linear inequalities. • Graph linear inequalities in two variables. • Use linear inequalities to solve real-life problems. • Check solutions of systems of linear inequalities. • Graph systems of linear inequalities. • Write systems of linear inequalities. • Use systems of linear inequalities to solve real-life problems.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

Learning Target	NJSLS:
1. Solve systems of linear equations. [*Standard*] - Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. [*Standard*] - 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. [*Standard*] - Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	**1.** *NJSLS-A-CED.A.3, NJSLS-A-REI.C.5, NJSLS-A-REI.C.6*

2. Determine the number of solutions to a system of linear equations. [*Standard*] - Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. [*Standard*] - Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.	**2.** *NJSLS-A-CED.A.3, NJSLS-A-REI.C.6*
3. Graph systems of linear inequalities. [*Standard*] - Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. [*Standard*] - Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.	**3.** *NJSLS-A-CED.A.3, NJSLS-A-REI.D.12*

Interdisciplinary Connections:

Real-World problem solving examples: Exercise Machines (p. 240), Selling Candles (p. 240), Account Balances (p. 240), Purchasing Binders (p. 240), Hiking (p. 240), Drama Production (p. 244), Farming (p. 245), Tubing Trips (p. 245), Radio Stations (p. 246), Delivery Vans (p. 250), Oil Change (p. 251), Downloading Music (p. 251), Current Speed (p. 252), Trail Mix (p. 258), Canoe Race (p. 258), Train Travel (p. 258), Ice Skating (p. 258), Fruit Salad (p. 270), Arcade Games (p. 272), Drama Production (p. 272), Delivering Boxes (p. 272), Leisure Time (p. 277), Making Muffins (p. 279), Working Hours (p. 279)

Interdisciplinary problem solving examples: Construction (p. 238), Financial Planning (p. 246), Track and Field (p. 258), Carpentry (p. 271), Marine Biology (p. 279), Art Projects (p. 280)

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*
- Algebra 1, Foundations, *Pearson Education Inc., 2015*

Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
- Desmos – online graphing tool
- IXL – web-based software
- G Suite for education – Google Classroom, Docs, Drive, Mail, etc…

Calculators:

- TI – 84 Plus graphing calculator
- TI – 30 XS MultiView

The following 21st century skills and the 8 mathematical practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments and projects:

21st Century skills:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Information literacy • Technology literacy • Media literacy
- Flexibility
- Leadership
- Initiative
- Productivity
- Social skills

Mathematical Practices:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

Students will write:

Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands-on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using notetaking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 5.1 Solving Systems of Linear Equations by Graphing:

Warm-up/Starting Options	**Explorations p. T-235**
Practice and Apply	**p. 239-240 #1-28, 31, 32,** **Algebra 1 Foundations Series Text p. 385-387 #1-16, 18-33**
Resources	**Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **IXL: Level J CC.2 Solve a system of equations by graphing -Shortcut - WV5** **Level K V.2 Solve a system of equations by graphing -Shortcut - TSS**

Section 5.2 Solving Systems of Linear Equations by Substitution:

Warm-up/Starting Options Explorations p. T-241
Practice and Apply p. 245-246 #1-20, 25, 26, 30, 32 Algebra 1 Foundations Series Text p. 393-395 #1-28
Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook IXL: Level J CC.8 Solve a system of equations using substitution - Shortcut - J8X Level M E.6 Solve a system of equations using substitution - Shortcut - BW5

Section 5.3 Solving Systems of Linear Equations by Elimination:

Warm-up/Starting Options	**Explorations p. T-247**
Practice and Apply	**p. 251-252 #1-26, 29 Algebra 1 Foundations Series Text p. 397-398 #1-21; p. 402-404 #1-16**
Resources	**Online Dynamic Classroom has all resources available. Review: Practice 33 odd A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook IXL: Level J CC.10 Solve a system of equations using elimination - Shortcut ZQV Level K V.10 Solve a system of equations using elimination - Shortcut - A48**

Section 5.4 Solving Special Systems of Linear Equations:

Warm-up/Starting Options Explorations p. T-253

Practice and Apply p. 257-258 #1-25, 29, 30

Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,
Student Journal, and Skills Review Handbook
Real Life STEM Video: Future Wind Power
IXL: Level J CC.5 Find the number of solutions to a system of equations -Shortcut - UYM

Section 5.6 Graphing Linear Inequalities in Two Variables:

Warm-up/Starting Options Explorations p. T-267

Practice and Apply p. 271-272 #1-38, 40
Algebra 1 Foundations Series Text p. 418-419 #1-25; p. 422-424 #1-21

Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,
Student Journal, and Skills Review Handbook
IXL: Level K U.3 Graph a two-variable linear inequality - Shortcut - HHP

Section 5.7 Systems of Linear Inequalities:

Warm-up/Starting Options	**Explorations p. T-273**
Practice and Apply	**p. 402-403 #1-30** **Algebra 1 Foundations Series Text p. 428-430 #1-22**
Resources	**Online Dynamic Classroom has all resources available. Review: Practice 33 odd A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook Real Life STEM Videos: Setting Fisher Limits IXL: Level N J.1 Solve systems of linear inequalities by graphing -Shortcut - KS6**

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 numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student recordkeeping, quizzes, exit/entrance assignments, peer/self-assessments, learning/response logs, discussions and practice presentations.

Summative Assessments:

The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Algebra Foundations curriculum/syllabus at the conclusion of an instructional time period.

- Diagnostic Pre-Test
- Chapter Tests
- Standardized Tests
- Standard Related Projects

Performance Assessments:

Performance Tasks, Projects

Accommodations/Modifications:

As per IEP.

Black Horse Pike Regional School District Curriculum

ENGAGING STUDENTS ⚫ FOSTERING ACHIEVEMENT ⚫ CULTIVATING 21ST CENTURY GLOBAL SKILLS **Course Name: Algebra 1 Foundations - Course Number: 113120**

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course Title: Algebra 1 / Exponential Functions and Sequences **Grade Level:** 10	**Unit Summary**: In this unit, students will begin working with nonlinear functions. This chapter introduces students to exponential functions. Students will revisit exponential functions in Algebra 2. The properties of exponents presented in the first lesson should be a review for students. Many of the problems involve numeric expressions, although there are algebraic expressions as well. The next lessons are about exponential functions.
Essential Question(s): • How can you write general rules involving properties of exponents? • What are some of the characteristics of the graph of an exponential function?	**Enduring Understanding(s):** Students will be able to: • Use zero and negative exponents. • Use the properties of exponents. • Solve real-life problems involving exponents. • Identify and evaluate exponential functions. • Graph exponential functions. • Solve real-life problems involving exponential functions.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

Learning Target	**NJSLS:**
1. Use properties of exponents. [*Standard*] - Rewrite expressions involving radicals and rational exponents using the properties of exponents.	**1.** *NJSLS-N-RN.A.2*

3. Graph exponential functions. 2. *NJSLS-A-CED.A.2,*

[*Standard*] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
[*Standard*] - 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.
[*Standard*] - Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude. [*Standard*] - Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). [*Standard*] - Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

Interdisciplinary Connections:
NJSLS-F-IF.B.4, NJSLS-F-IF.C.7e, NJSLS-F-IF.C.9, NJSLS-F-LE.A.1c

Real-World problem solving examples: Finding Volume (p. 295), Computer Chips (p. 296), Harvesting Vegetables (p. 297), Computer Memory (p. 297), Coyote Population (p. 311), Art Gallery (p. 312), Sales Report (p. 312), Bald Eagle Populations (p. 313),

Interdisciplinary problem solving examples: Marine Biology (p. 295), Using Microscopes (p. 296), Chemistry (p. 297), Bacterial Populations (p. 309), Stock Prices (p. 312), Forensic Science (p. 313)

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*
- Algebra 1, Foundations, *Pearson Education Inc., 2015*

Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
- Desmos – online graphing tool
- IXL – web-based software
- G Suite for education – Google Classroom, Docs, Drive, Mail, etc…

Calculators:

- TI – 84 Plus graphing calculator
- TI – 30 XS MultiView

The following 21st century skills and the 8 mathematical practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments and projects:

21st Century skills:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Information literacy
- Technology literacy
- Media literacy
- Flexibility
- Leadership
- Initiative
- Productivity
- Social skills

Mathematical Practices:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

Students will write:

Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills?

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands-on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 6.1 Properties of Exponents:

Warm-up/Starting Options Explorations p. T-291

Practice and Apply p. 296-298 #1-44, 47-50

Algebra 1 Foundations Series Text p. 446-447 #1-39; p. 458-459 #1-40; p. 464-465 #1-45; p. 471-472 # 1-52

Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,

Student Journal, and Skills Review Handbook

IXL: Level L A.5 Properties of exponents - Shortcut - LNK

Section 6.3 Exponential Functions:

Warm-up/Starting Options Explorations p. T-305

Practice and Apply p. 310-312 #1-24, 42, 55,58

Algebra 1 Foundations Series Text p. 478-479 #1-25

Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time,

Student Journal, and Skills Review Handbook

IXL: Level K Y.3 Match exponential functions and graphs I - Shortcut - BYF

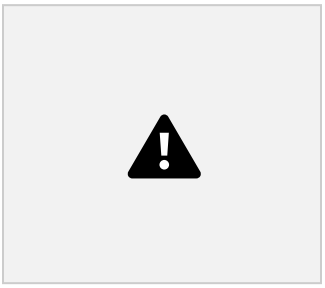
Level K Y.5 Domain and range of exponential functions: graphs - Shortcut - ANC

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 numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student recordkeeping, quizzes, exit/entrance assignments, peer/self-assessments, learning/response logs, discussions and practice presentations.

Summative Assessments:

The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Algebra Foundations curriculum/syllabus at the conclusion of an instructional time period.

- Diagnostic Pre-Test
- Chapter Tests
- Standardized Tests
- Standard Related Projects

Performance Assessments:

Performance Tasks, Projects

Accommodations/Modifications:

As per IEP.

Black Horse Pike Regional School District Curriculum

ENGAGING STUDENTS ⚫ FOSTERING ACHIEVEMENT ⚫ CULTIVATING 21ST CENTURY GLOBAL SKILLS **Course Name: Algebra 1 Foundations - Course Number: 113120**

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title	**Unit Summary**:
Algebra I/Polynomial Equations and Factoring	In this unit students identify, classify, add, subtract, and multiply polynomials. They use vertical and horizontal formats to find sums and differences of polynomials and use the distributive property, tables of products and patterns, (including the FOIL pattern, the square of a binomial pattern and the sum and difference pattern) to find products. They use polynomial equations to describe and solve real-world problems. Students will then factor polynomials and use factoring to solve equations, to find the zeros of functions, and to find the roots ofequations. Finally, they factor polynomials completely using a variety of techniques. **Enduring Understanding(s):** Students will be able to: • Add and subtract polynomials. • Multiply polynomials. • Find special products of polynomials. • Solve polynomial equations by factoring.

Grade Level(s): 10 **Essential Question(s):** • How do I add, subtract and multiply polynomials? • How do I factor polynomials? • How do I write and solve polynomial equations to solve problems?	• Factor $x^2 + bx + c$. • Factor $ax^2 + bx + c$. • Factor special products. • Factor polynomials completely.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

Learning Target	**NJSLS:**
1. Adding, Subtracting and Multiplying polynomials. *[Standard] - Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and* *multiplication; add, subtract, and multiply polynomials.*	**1.** *NJSLS.A.APR.A.1*

2. Factoring polynomials *[Standard] - Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.* *[Standard] - Solve quadratic equations in one variable. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), 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.* *[Standard] - Choose and produce an equivalent form of an expression to reveal andexplain properties of the quantity represented by the expression. Factor a quadratic expression to reveal the zeros of the function it defines.* *[Standard] - Prove polynomial identities and use them to describe numerical relationships. For example, the polynomial identity $(x^2 + y^2)^2 = (x^2 – y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples.* *[Standard] - Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.* **3. Writing and solving polynomial equations** *[Standard] - Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.* *[Standard] - Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.*	**2.** *NJSLS.A.CED.A.1, NJSLS.A.REI.B.4b, NJSLS.A.SSE.B.3.a, NJSLS.A.APR.C.4, NJSLS.F.IF.C.8a* **3**. *NJSLS.A.CED.A.1, NJSLS.F.IF.C.8a*

Interdisciplinary Connections:

Real-World problem solving examples: Investments (p. 362), Bracelets (p.363), Gym Membership (p.363), Velocity (p.363), Construction (p. 364), Hockey (p.368), Football (p.370), Optometry (p.376), Fireplace (p.380), Arches (p.382), Farming (p.388), Projector (p.389), Parking Lot (389), Construction (p.390), Wildlife Preserve (p.394), Sign Design (p.395), Swimming Pool (p.396), Envelope (p.396), Playground (p. 401), Painting (p.402), Grasshopper (p. 42), Fish tank (p.406), Birdhouse (p.407), Gift bag (p.408), Magician (p.413), Miniature Golf (p.415)

Interdisciplinary problem solving examples: Photography (p.370), Biology – Genealogy (p.374 and p.376), Architecture (p.375), Photography (p.390), Photography (p.402)

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*
- Algebra 1, Foundations, *Pearson Education Inc., 2015*

Online Resources incorporated through the year, include but not limited to:

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- IXL – web-based software
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- Social skills

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Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills.

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands-on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note-taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 7.1 Adding and Subtracting Polynomials:

Warm-up/Starting Options	**Explorations p. 357**
Practice and Apply	**p. 362 #1-4, 6-18 even, 22-46 even** **Algebra 1 Foundations Series Text p. 505-507 #1-39**
Resources	**Online Dynamic Classroom has all resources available.** **Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook IXL:** **Level J DD.4 Add and subtract polynomials -Shortcut - W75** **Level M L.2 Add and subtract polynomials - Shortcut - 9A3**

Section 7.2 Multiplying Polynomials:

Warm-up/Starting Options	**Explorations p. 365**
Practice and Apply	**p. 369 # 1, 4-24 even, 28,30** **Algebra 1 Foundations Series Text p. 511-512 #1, 9-15, 29-37; p. 516 #1-21; p. 519-520 #1-13, 16-20**
Resources	**Online Dynamic Classroom has all resources available.** **Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook IXL:Level K AA.6 Multiply a polynomial by a monomial - Shortcut G2G** **Level J DD.12 Multiply polynomials - Shortcut - JB7**

Section 7.3 Special Products of Polynomials:
Warm-up/Starting Options Explorations p. 371
Practice and Apply p. 375 # 4-10 even, 16, 18, 22, 34 Algebra 1 Foundations Series Text p. 525-526 #1-14, 22-27, 32-40
Resources Online Dynamic Classroom has all resources available. **Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **IXL: Level M L.3 Multiply polynomials - Shortcut - 8GN**

Section 7.4 Solving Polynomial Equations in Factored Form:

Warm-up/Starting Options Explorations p. 377
Practice and Apply p. 381 # 2-8, 10-16 even, 26-38 even, 41 Algebra 1 Foundations Series Text p. 587-589 #1, 8-12, 23
Resources Online Dynamic Classroom has all resources available. **Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **IXL: Level K CC.7 Solve a quadratic equation using the zero product property - Shortcut - TNM**

Section 7.5 Factoring $x^2 + bx + c$:

Warm-up/Starting Options Explorations p. 385
Practice and Apply p. 389 #1, 4-26 even, 30-38 even, 39 Algebra 1 Foundations Series Text p. 535-537 #1-29
Resources Online Dynamic Classroom has all resources available. **Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **IXL: Level K BB.4 Factor quadratics with leading coefficient 1 - Shortcut - S9P**

Section 7.6 Factoring $ax^2 + bx + c$:

Warm-up/Starting Options Explorations p. 391
Practice and Apply p. 395 #1, 4-28 even, 33 Algebra 1 Foundations Series Text p. 541-542 #1-27
Resources Online Dynamic Classroom has all resources available. **Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **IXL: Level K BB.5 Factor quadratics with other leading coefficients - Shortcut - 7ED**

Section 7.7 Factoring Special Products:	
Warm-up/Starting Options Explorations p. 397	
Practice and Apply p. 401 #1, 4-8 even, 16-22 even, 26-32 even, 36-40 even Algebra 1 Foundations Series Text p. 548-549 #1-38	

	Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, **Student Journal, and Skills Review Handbook** **STEM Video and Performance Task: Birds Dropping Food** **IXL: Level K BB.6 Factor quadratics: special cases - Shortcut - 56E**
	Section 7.8 Factoring Polynomials Completely:
	Warm-up/Starting Options Explorations p. 403
	Practice and Apply p. 407 #1, 4-32 even, 38, 40 **Algebra 1 Foundations Series Text p. 553-554 #1-21**
	Resources Online Dynamic Classroom has all resources available. Review: Practice A and Practice B, Puzzle Time, **Student Journal, and Skills Review Handbook** **IXL: Level K BB.7 Factor by grouping - Shortcut - HAA**

PART IV: EVIDENCE OF LEARNING

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IDENTIFY BLOOM'S LEVELS.

Formative Assessments:

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- Standardized Tests
- Standard Related Projects

Performance Assessments:

Performance Tasks, Projects

Accommodations/Modifications:

As per IEP.

Black Horse Pike Regional School District Curriculum ENGAGING

STUDENTS ⚫ FOSTERING ACHIEVEMENT ⚫ CULTIVATING 21ST CENTURY GLOBAL SKILLS

Course Name: Algebra 1 Foundations - Course Number: 113120

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title:
Algebra 1/Solving Quadratic Equations

In this unit students solve quadratic equations by factoring, graphing, using square roots, completing the square, and using the quadratic formula. Students use the discriminant to determine the number or type of solutions of a quadratic equation. Students will simplify radical expressions, including rationalizing denominators. Students also add, subtract, and multiply radicals.

Grade Level(s):
10

Essential Question(s):

- How do I solve quadratic equations?
- How do I use properties of radicals in expressions and equations?

Unit Summary:

Enduring Understanding(s):
Students will be able to:

- Solve quadratic equations by graphing.
- Use square roots to solve quadratic equations.
- Solve quadratic equations by completing the square.
- Solve quadratic equations by the quadratic formula.
- Simplify radical expressions.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

Learning Target	**NJSLS:**
1. Solving quadratic equations *[Standard] - Create equations and inequalities in one variable solving and use them to solveproblems. Include equations arising from linear and quadratic functions, and simple rationaland exponential functions.* *[*Standard*] - Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.* *[Standard] - Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. Forexample, represent inequalities describing nutritional and cost constraints on combinations of different foods.* *[Standard] - Solve quadratic equations in one variable. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x – p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.* *[Standard] - Solve quadratic equations in one variable. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), 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.* *[Standard]* - Explain why the *x*-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. *[Standard] - Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression. Factor a quadratic expression to reveal the zeros of the function it defines.* *[Standard] - Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.* *[Standard] - Find inverse functions. Solve an equation of the form f(x) = c for a simple function f that has an inverse and write an expression for the inverse. For example, f(x) =2 x3or f(x) = (x+1)/(x–1) for x 1.* *[Standard]* - Graph functions expressed symbolically and show key features of the graph, byhand in simple cases and using technology for more complicated cases. Graph linear and quadratic functions and show intercepts, maxima, and minima. *[Standard]* - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases*. Graph polynomial functions, identifying zeros when suitable factorizations are available, and showing end behavior.* *[Standard] - Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.*	**1.** *NJSLS.A.CED.A.1,* *NJSLS, A.CED.A.2,* *NJSLS.A.CED.A.3,* *NJSLS.REI.B.4a,* *NJSLS.A.REI.B.4b,* *NJSLS.A.REI.D.11,* *NJSLS.A.SSE.B.3,* *NJSLS.F.BF. B.3,* *NJSLS.F.IF.B.4.a,* *NJSLS.F.IF.C.7a,* *NJSLS.F.IF.C.7c,* *NJSLS.F.IF.C.8a*

Interdisciplinary Connections:

Real-World problem solving examples: Football (p.493), Golf (p.495), Volleyball (p.495), Softball (p.496), Fire Hose (p.496), Fish tank (p.500), Traffic Sign (p.500), Pond (p.501), Bleachers (p.501), Rug (p.502), Fishing (p.504), Creating a Chalkboard (p.510), Throwing an object (p.513), Patio (p.513), Poster (p.513), Fencing (p.513), Knitting (p.514), Dolphins (p.521), Trout Population (p.521), Fountain (p.522), Camping (p.522), Fencing (p.523), Football (p.523), Space Travel (p.523), Boating (p.531), Amusement Parks (p.537)

Interdisciplinary problem solving examples:History – Civil War (p.495), Architecture (p.511), Art (p.511), Geometry (p.513), Physics – Velocity (p.513), Stock Market (p.514), Architecture (p.531)

Students will engage with the following text, resources and tools:

Text:

- Algebra 1, A Common Core Curriculum – Big Ideas Math, *Big Ideas Learning LLC., 2019*
- Algebra 1, Foundations, *Pearson Education Inc., 2015*

Online Resources incorporated through the year, include but not limited to:

- BigIdeasMath.com – publisher on-line assignments, resources and text
- Desmos – online graphing tool
- IXL – web-based software
- G Suite for education – Google Classroom, Docs, Drive, Mail, etc…

Calculators:

- TI – 84 Plus graphing calculator
- TI – 30 XS MultiView

The following 21st century skills and the 8 mathematical practices are embedded throughout the course and are evident in daily lessons, assignments, activities, assessments and projects:

21st Century skills:

- Critical thinking
- Creativity
- Collaboration
- Communication
- Information literacy • Technology literacy • Media literacy
- Flexibility
- Leadership
- Initiative
- Productivity
- Social skills

Mathematical Practices:

- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Construct viable arguments and critique the reasoning of others
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure
- Look for and express regularity in repeated reasoning

Students will write:

Students will define and compare/contrast given terms. Students will express their knowledge and skills in their own words, organize their thinking about the content, and write explanations to solve problems. Students will also relate real world situations using algebra terminology.

PART III: TRANSFER OF KNOWLEDGE AND SKILLS

DESCRIBE THE LEARNING EXPERIENCE.

How will students uncover content and build skills.

Opportunities for developing students' understanding in this chapter include: investigating algebra activities, problem solving workshops, modeling examples, using real-life application or other hands-on activities such as projects. Technology such as animated algebra, Smart Board, and graphing calculators will also be explored through the learning experience. Other interests could include, but is not limited to alternative lesson openers, using note-taking strategies, math and history applications, and interdisciplinary applications.

Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 9.2 Solving Quadratic Equations by Graphing:

Warm-up/Starting Options Explorations p. 489

Practice and Apply p. 494 #2-4, 6-36 even, 53, 54

Algebra 1 Foundations Series Text p. 569-571 #1-15, 20-23; p. 576-577 #1-15; p. 582 # 8-16

Resources Online Dynamic Classroom has all resources available.

Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook

Section 9.3 Solving Quadratic Equations using Square Roots:

Warm-up/Starting Options Explorations p. 497

Practice and Apply p. 501 #1, 2-30 even, 32,33

Algebra 1 Foundations Series Text p. 582 #17-31

Resources Online Dynamic Classroom has all resources available.

Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook

IXL: Level K CC.6 Solve a quadratic equation using square roots - Shortcut - ERF

Section 9.4 Solving Quadratic Equations by Completing the Square:

Warm-up/Starting Options Explorations p. 505

Practice and Apply p. 511 #17-22, 25, 26, 33

Algebra 1 Foundations Series Text p. 598-599 #1-22

Resources Online Dynamic Classroom has all resources available.

Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook

IXL: Level K CC.10 Solve a quadratic equation by completing the square - Shortcut - XCL

Section 9.5 Solving Quadratic Equations Using the Quadratic Formula:

Warm-up/Starting Options Explorations p. 515

Practice and Apply p. 521 #1, 4-22 even, 38-44

Algebra 1 Foundations Series Text p. 605-606 #1-3, 7-22

Resources Online Dynamic Classroom has all resources available.

Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook

IXL: Level K CC.11 Solve a quadratic equation using the quadratic formula - Shortcut - XCF

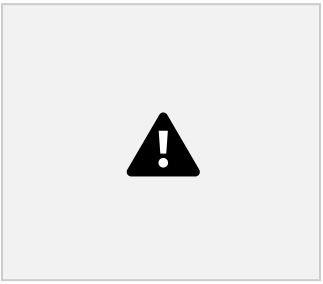
PART IV: EVIDENCE OF LEARNING

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 numerous activities and strategies including the following: teacher observations, students collaborating with peers, questioning strategies, student recordkeeping, quizzes, exit/entrance assignments, peer/self-assessments, learning/response logs, discussions and practice presentations.

Summative Assessments:

The following assessments will be used to evaluate student learning, skill acquisition and academic achievement of the Standards of Mathematical Practice and the New Jersey Learning Standards for Mathematics listed under each chapter in the Algebra Foundations curriculum/syllabus at the conclusion of an instructional time period.

- Diagnostic Pre-Test
- Chapter Tests
- Standardized Tests

- Standard Related Projects

Performance Assessments:

Performance Tasks, Projects

Accommodations/Modifications:

As per IEP.

Black Horse Pike Regional School District Curriculum

ENGAGING STUDENTS ⚫ FOSTERING ACHIEVEMENT ⚫ CULTIVATING 21ST CENTURY GLOBAL SKILLS **Course Name: Algebra 1 Foundations - Course Number: 113120**

PART I: UNIT RATIONALE

WHY ARE STUDENTS LEARNING THIS CONTENT AND THESE SKILLS?

Course/Unit Title **Algebra 1/Radical Functions and Equations**	**Unit Summary**: In this unit students graph square root functions. They solve radical equations, including equations with extraneous solutions.
Grade Level(s): 10	

Essential Question(s):

- How do I graph square root functions?
- How do I solve radical equations?

Enduring Understanding(s):

Students will be able to:

- Graph square root functions.
- Solve radical equations.

PART II: INSTRUCTIONAL STRATEGIES AND RESOURCES

DESCRIBE THE LEARNING TARGETS.

After each target, identify the New Jersey Student Learning Standards that are applicable

Learning Target	**NJSLS:**
1. Graphing Square Root Functions *[Standard] - Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. Graph square root, cube root, and piecewise-defined functions including step* *functions and absolute value functions.* **2. Using properties of radicals in expressions and equations.** *[Standard] - Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.*	**1.** *NJSLS.F.IF.C.7b* **2.** *NJSLS.A.REI.A.2*

Interdisciplinary Connections:

Real-World problem solving examples: Van Speed (p.549), Fire Hose (p.549), Long Jump (p.550), Pendulum (p.563), BASE Jumping (p.564), Hair Dryer (p. 565), Trapeze Artist (p.565)

Interdisciplinary problem solving examples: Physics – Velocity (p.547 and 549), Geometry (p.566), Music (p.566)

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Suggested warm-up activities, instructional strategies/activities, and assignments:

Section 10.1 Graphing Square Root Functions:

Warm-up/Starting Options	**Explorations p. 543**
Practice and Apply	**p. 548 #1-2, 21-25, 29, 30, 35, 38-44 even**
Resources	**Online Dynamic Classroom has all resources available.** **Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **STEM Video and Performance Assessment: Tsunami! IXL: Level K GG.4 Graph square root functions - Shortcut - VWK**

Section 10.3 Solving Radical Equations:

Warm-up/Starting Options Explorations p. 559

Practice and Apply p. 564 #1, 2-32 even, 51-59 odd, 72 Algebra 1 Foundations Series Text p. 649-650 #1-23
Resources Online Dynamic Classroom has all resources available. **Review: Practice A and Practice B, Puzzle Time, Student Journal, and Skills Review Handbook** **IXL: Level K GG.6 Solve radical equations II - Shortcut - ZGH**

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