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| **Curriculum Management System** | |
| ***PAULSBORO PUBLIC SCHOOLS*** | |
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| **Mathematics – Grade 7** | |
| **UPDATED JUNE 2016** | |
| **For adoption by all regular education programs as specified and for adoption or adaptation by all Special Education Programs in accordance with Board of Education Policy.** | **Board Approved: September 2016** |

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| |  | | --- | |  | | **Paulsboro Public Schools**  ***Dr. Laurie Bandlow, Superintendent***  ***Board of Education***  Mr. Thomas Ridinger, President Ms. Bonnie Eastlack, Vice President Mrs. Barbara Dunn Mr. Marvin E. Hamilton, Sr. Mr. John Hughes\* Mr. Joseph L. Lisa Mrs. Lisa L. Lozada-Shaw  Mrs. Lisa Priest Mrs. Irma R. Stevenson Mr. James J. Walter  \* Greenwich Township Board of Education Representative  ***District Administration***  Dr. Lucia Pollino, Director of Curriculum & Assessment  Ms. Jennifer Johnson, Business Administrator/Board Secretary  Mr. John Giovannitti, Director of Special Services  Mr. Paul Bracciante, Principal, grades Pre-K to 2  Mr. Matthew J. Browne, Principal, grades 3-6  ***Curriculum Writing Team***  Judy Hathaway, Curriculum Faciliator | | **Paulsboro Public Schools** | | **MissionStatement**  The mission of the Paulsboro School District is to provide each student the educational opportunities to assist in attaining their full potential in a democratic society. Our instructional programs will take place in a responsive, community based school system that fosters respect among all people.Our expectation is that all students will achieve the New Jersey Core Curriculum Content Standards (NJCCCS) at every grade level. |   New Jersey State Department of Education  21st Century College and Career Readiness Standards  **The 12 Career Ready Practices**  These practices outline the skills that all individuals need to have to truly be adaptable, reflective, and proactive in life and careers. These are researched practices that are essential to career readiness.  CRP1. Act as a responsible and contributing citizen and employee.  CRP2. Apply appropriate academic and technical skills.  CRP3. Attend to personal health and financial well-being.  CRP4. Communicate clearly and effectively and with reason.  CRP5. Consider the environmental, social and economic impacts of decisions.  CRP6. Demonstrate creativity and innovation.  CRP7. Employ valid and reliable research strategies.  CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.  CRP9. Model integrity, ethical leadership and effective management.  CRP10. Plan education and career paths aligned to personal goals.  CRP11. Use technology to enhance productivity.  CRP12. Work productively in teams while using cultural global competence.  Reading and Writing Standards  [CCSS.ELA-LITERACY.RL.7.1](http://www.corestandards.org/ELA-Literacy/RL/7/#CCSS.ELA-Literacy.RL.7.1) - 7.10  [CCSS.ELA-LITERACY.RI.7.1](http://www.corestandards.org/ELA-Literacy/RI/7/#CCSS.ELA-Literacy.RI.7.1) – 7.10  [CCSS.ELA-LITERACY.W.7.1](http://www.corestandards.org/ELA-Literacy/W/7/#CCSS.ELA-Literacy.W.7.1) – 7.10 |
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**Standards for Mathematical Practice**

MP.1 Make sense of problems and persevere in solving them.

MP.2 Reason abstractly and quantitatively.

MP.3 Construct viable arguments & critique the reasoning of others.

MP.4 Model with mathematics.

MP.5 Use appropriate tools strategically.

MP.6 Attend to precision.

MP.7 Look for and make use of structure.

MP.8 Look for and express regularity in repeated reasoning.

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| **Scope and Sequence** | |
| **Quarter 1 – Grade 7 (45 days) Sept. - Mid. Nov.** | |
| **Big Idea I:**  **Understand integers, absolute value, and rational numbers.**  **Big Idea III:**  **Write, simplify, expand, and factor linear expressions.** | **Big Idea II:**  **Add, subtract, multiply, and divide integers and rational numbers.**  **Big Idea IV:**  **Add and subtract linear expressions and analyze equivalent expressions.** |

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| **Scope and Sequence** | |
| **Quarter 2 – Grade 7 ( 45 days) Mid Nov. - Jan.** | |
| **Big Idea I:**    **Write and solve two-step equations and solve equations using the distributive property.**  **Big Idea III:**  **Connect ratios, rates, and unit rates.** | **Big Idea II:**    **Write, solve, and graph inequalities involving one-step, two-steps, and multi-steps.**  **Big Idea IV:**  **Understand, describe, and graph proportional relationships.** |

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| **Scope and Sequence** | |
| **Quarter 3 – Grade 7 (45 days) Feb. - Mid April** | |
| **Big Idea I:**  **Analyze percents, connect percents to proportions, and use the percent equation.**  **Big Idea III:**  **Analyze and draw inferences about biased and unbiased samples.** | **Big Idea II:**  **Solve percent change, percent error, markup, markdown, and simple interest problems.**  **Big Idea IV:**  **Compare populations using data displays and statistical measures.** |

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| **Scope and Sequence** | |
| **Quarter 4 – Grade 7 ( 45 days) Mid April - June** | |
| **Big Idea I:**  **Understand and find probability of simple events and represent sample spaces.**  **Big Idea III:**  **Draw geometric figures and solve problems involving scale drawings, angle relationships, and circumference of a circle.** | **Big Idea II:**  **Determine outcomes, find probabilities, and simulate compound events.**  **Big Idea IV:**  **Solve problems involving area of a circle, surface area, and volume.**  **Describe cross sections.** |

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| **QUARTER 1 –**  **Big Idea I: Understand integers, absolute value, and rational numbers.**  **Topic: Integers and Rational Numbers** | | |
| **Standards:**  Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.  **7.NS.1**  **a.** Describe situations in which opposite quantities combine to make 0.  **b.** Understand ***p*** + ***q*** as the number located a distance |***q***| from ***p***, in the positive or negative direction depending on whether ***q*** is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.  **c.** Understand subtraction of rational numbers as adding the additive inverse, ***p*** – ***q*** = ***p*** + (–***q***). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.  **d.** Apply properties of operations as strategies to add and subtract rational numbers.  **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| The students will be able to understand integers, absolute value, and rational numbers. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How are integers and their opposites related?** * **How are rational numbers written as decimals?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  • T**here are many ways to represent a**  **number.**  **• Number sense develops through**  **experience.**  **• Operations create relationships**  **between numbers.**  **• The relationships among the operations**  **and their properties promote**  **computational fluency.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 1 –**  **Big Idea II: Add, subtract, multiply, and divide integers and rational numbers.**  **Topic: Integers and Rational Numbers** | | |
| **Standards:**  Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.  **7.NS.1**  **d.** Apply properties of operations as strategies to add and subtract rational numbers.  Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.  **7.NS.2**  **a.** Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (–1)(–1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.  **b.** Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non- zero divisor) is a rational number. If ***p*** and ***q*** are integers, then –(***p***/***q***) = (–***p***)/***q*** = ***p***/(–***q***). Interpret quotients of rational numbers  by describing real-world contexts.  **c.** Apply properties of operations as strategies to multiply and  divide rational numbers.  Solve real-world and mathematical problems involving the four operations with rational numbers.  **7.NS.3**  Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies.  **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| Students will be able to add, subtract, multiply, and divide integers and rational numbers. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How do you use what you know about absolute value to add integers?** * **How is subtracting integers related to adding integers?** * **How are adding and subtracting integers related to adding and subtracting other rational numbers?** * **How do the signs of factors affect their product?** * **How is multiplying rational numbers like multiplying integers?** * **How does dividing integers relate to multiplying integers?** * **How is dividing rational numbers like dividing integers?** * **How do you decide which rational number operations to use to solve problems?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  • **There are many ways to represent a**  **number.**  **• Number sense develops through**  **experience.**  **• Operations create relationships**  **between numbers.**  **• The relationships among the operations**  **and their properties promote**  **computational fluency.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 1 –**  **Big Idea III: Write, simplify, expand, and factor linear expressions.**  **Topic: Generate Equivalent Expressions** | | |
| **Standards:**  Use properties of  operations to generate equivalent expressions.  **7.EE.1**  Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.    **7.EE.2**  Understand that rewriting an expression in different forms in a  problem context can shed light on the problem and how the quantities  in it are related. *For example, a + 0.05a = 1.05a means that “increase by 5%” is the same as “multiply by 1.05.”*  **7.EE.4**  Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.   1. ***Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?***   **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| Students will learn to write, simplify, expand, and factor linear expressions. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How can algebraic expressions be used to represent and solve problems?** * **What are equivalent expressions?** * **How are properties of operations used to simplify expressions?** * **How does the value of an expression change when it is expanded?** * **How does the Distributive Property relate to factoring expressions?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• Real world situations can be**  **represented symbolically and**  **graphically.**  **• Algebraic expressions and equations**  **generalize relationships from specific**  **cases.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 1 –**  **Big Idea IV: Add and subtract linear expressions and analyze equivalent expressions.**  **Topic: Generate Equivalent Expressions** | | |
| **Standards:**  Use properties of  operations to generate equivalent expressions.  **7.EE.1**  Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.  **7.EE.2**  Understand that rewriting an expression in different forms in a  problem context can shed light on the problem and how the quantities  in it are related. *For example, a + 0.05a = 1.05a means that “increase by 5%” is the same as “multiply by 1.05.”*  **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| Students will learn to add and subtract linear expressions and analyze equivalent expressions. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How can properties of operations be used to add expressions?** * **How can properties of operations be used to subtract expressions?** * **How can writing equivalent expressions show how quantities** * **are related?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• Real world situations can be**  **represented symbolically and**  **graphically.**  **• Algebraic expressions and equations**  **generalize relationships from specific**  **cases.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 2 –**  **Big Idea I: Write and solve two-step equations and solve equations using the distributive property.**  **Topic: Solve Problems Using Equations and Inequalities** | | |
| **Standards:**  Solve real‐life and  mathematical problems  using numerical and  algebraic expressions and  equations.  **7.EE.3**  Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. ***For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.***  **7.EE.4**  Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.   1. ***a. Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?***   **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | GOAL | |
| Students will learn to write and solve two-step equations and solve equations using distributive property. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How does an equation show the relationship between variables and other quantities in a situation?** * **How is solving a two-step equation similar to solving a one-step equation?** * **How does the Distributive Property help you solve equations?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding**   **Resources** | |
| **Enduring Understanding:**  **• Real world situations can be**  **represented symbolically and**  **graphically.**  **• Algebraic expressions and equations**  **generalize relationships from specific**  **cases.**  **• A problem solver understands what**  **has been done, knows why the process**  **was appropriate, and can support it**  **with reasons and evidence.**  **• There can be different strategies to**  **solve a problem, but some are more**  **effective and efficient than others are.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 2 –**  **Big Idea II: Write, solve, and graph inequalities involving one-step, two-steps, and multi-steps.**  **Topic: Solve Problems Using Equations and Inequalities** | | |
| **Standards:**  Solve real‐life and  mathematical problems  using numerical and  algebraic expressions and  equations.  **7.EE.3**  Solve multi-step real-life and mathematical  problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of  answers using mental computation and estimation strategies. ***For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.***  **7.EE.4**  Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.  ***a.***  ***Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?***   1. ***b. Solve word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions***   **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| Students will learn to write, solve, and graph inequalities involving one-step, two steps, and multi-steps. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How is solving inequalities with addition and subtraction similar to and different from solving equations with addition and subtraction?** * **How is solving inequalities with multiplication and division similar to and different from soling equations with multiplication and division?** * **How is solving a two-step inequality similar to and different from solving a two-step equation?** * **How is solving a multi-step inequality similar to and different from solving a multi-step equation?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• Real world situations can be**  **represented symbolically and**  **graphically.**  **• Algebraic expressions and equations**  **generalize relationships from specific**  **cases.**  **• A problem solver understands what**  **has been done, knows why the process**  **was appropriate, and can support it**  **with reasons and evidence.**  **• There can be different strategies to**  **solve a problem, but some are more**  **effective and efficient than others are.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 2 –**  **Big Idea III: Connect ratios, rates, and unit rates.**  **Topic: Analyze and Use Proportional Relationships** | | |
| **Standards:**  Analyze proportional  relationships and use  them to solve real‐world  and mathematical problems.  **7.RP.1**  Compute unit rates associated with ratios of fractions, including ratios  of lengths, areas and other quantities measured in like or different  units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.*  **7.RP.3**  Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*  **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
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| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How are ratios, rates, and unit rates used to solve problems?** * **Why is it useful to write a ratio of fractions as a unit rate?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• Proportional relationships express**  **how quantities change in relationship**  **to each other.**  **• Measurement describes the attributes**  **of objects and events.**  **• Standard units of measure enable**  **people to interpret results or data.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 2 –**  **Big Idea IV: Understand, describe, and graph proportional relationships.**  **Topic: Analyze and Use Proportional Relationships** | | |
| **Standards:**  Analyze proportional  relationships and use  them to solve real‐world  and mathematical problems.  **7.RP.2**  Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a  coordinate plane and observing whether the graph is a straight line through the origin.  b. Identify the constant of proportionality (unit rate) in tables,  graphs, equations, diagrams, and verbal descriptions of proportional relationships.  c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the*  *number of items can be expressed as t = pn*.  d. Explain what a point *(x, y)* on the graph of a proportional  relationship means in terms of the situation, with special attention to the points (0, 0) and (1, *r)* where *r* is the unit rate.  **7.RP.3**  Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*  **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
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| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How are proportional quantities described by equivalent ratios?**      * **How can you represent a proportional relationship with an equation?** * **What does the graph of a proportional relationship look like?** * **How can proportional reasoning help solve a problem?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• Proportional relationships express**  **how quantities change in relationship**  **to each other.**  **• Measurement describes the attributes**  **of objects and events.**  **• Standard units of measure enable**  **people to interpret results or data.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 3–**  **Big Idea I: Analyze percents, connect percents to proportions, and use the percent equation.**  **Topic: Analyze and Solve Percent Problems** | | |
| **Standards:**  Analyze proportional  relationships and use  them to solve real‐world  and mathematical problems.  **7.RP.2**  Recognize and represent proportional relationships between quantities. a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a  coordinate plane and observing whether the graph is a straight line through the origin.  b. Identify the constant of proportionality (unit rate) in tables,  graphs, equations, diagrams, and verbal descriptions of proportional relationships.  c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn*.  **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| Students will learn to analyze percents, connect percents to proportions, and use the percent equation. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How do percents show the relationship between quantities?** * **How does proportional reasoning relate to percent?** * **How are percent problems related to proportional reasoning?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• Proportional relationships express**  **how quantities change in relationship**  **to each other.**  **• In certain situations, an estimate is as**  **useful as an exact answer.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 3 –**  **Big Idea II: Solve percent change, percent error, markup, markdown, and simple interest problems.**  **Topic: Analyze and Solve Percent Problems** | | |
| **Standards:**  Analyze proportional  relationships and use  them to solve real‐world  and mathematical problems.  **7.RP.3**  Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*  **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| Students will learn to solve percent change, percent error, markup, markdown, and simple interest problems. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How is finding percent error similar to finding percent change?** * **How are the concepts of percent markup and percent markdown related to the percent equation?** * **How does simple interest show proportional reasoning and relate to the percent equation?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• Proportional relationships express**  **how quantities change in relationship**  **to each other.**  **• In certain situations, an estimate is as**  **useful as an exact answer.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 3 –**  **Big Idea III: Analyze and draw inferences about biased and unbiased samples.**  **Topic: Use Sampling to Draw Inferences about Populations** | | |
| **Standards:**  Analyze proportional  relationships and use  them to solve real‐world  and mathematical problems.  **7.RP.3**  Use proportional relationships to solve multistep ratio and percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*  Use random sampling to draw inferences about a population.  **7.SP.1**  Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.  **7.SP.2**  Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples  (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean word length in*  *a book by randomly sampling words from the book; predict the winner of*  *a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.*  Solve real‐life and  mathematical problems  using numerical and  algebraic expressions and  equations.  **7.EE.3**  Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. ***For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.***  **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| Students will learn to analyze and draw inferences about biased and unbiased samples. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How can you determine a representative sample of a population?** * **How can inferences be drawn about a population from data gathered from samples?** * **How can data displays be used to compare populations?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• Patterns and relationships can be**  **represented numerically, graphically,**  **symbolically, and verbally.**  **• Patterns provide insights into potential**  **relationships.**  **• The way that data is collected,**  **organized and displayed influences**  **interpretation.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 3 –**  **Big Idea IV: Compare populations using data displays and statistical measures.**  **Topic: Use Sampling to Draw Inferences about Populations** | | |
| **Standards:**  Use random sampling to draw inferences about a population.  **7.SP.3**  Informally assess the degree of visual overlap of two numerical  data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball*  *team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on*  *a dot plot, the separation between the two distributions of heights is noticeable.*  **7.SP.4**  Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about  two populations. *For example, decide whether the words in a chapter*  *of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.*  **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| Students will learn to compare populations using data displays and statistical measures. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How can dot plots and statistical measures be used to compare populations?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• Patterns and relationships can be**  **represented numerically, graphically,**  **symbolically, and verbally.**  **• Patterns provide insights into potential**  **relationships.**  **• The way that data is collected,**  **organized and displayed influences**  **interpretation.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 4 –**  **Big Idea I: Understand and find probability of simple events and represent sample spaces.**  **Topic: Probability** | | |
| **Standards:**  Investigate chance processes and develop, use, and evaluate probability models.  **7.SP.5**  Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.  **7.SP.6**  Approximate the probability of a chance event by collecting data on  the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*  **7.SP.7**  Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.  a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. *For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.*  b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. *For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?*  Solve real‐life and  mathematical problems  using numerical and  algebraic expressions and  equations.  **7.EE.3**  Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. ***For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.***  **7.EE.4**  Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.   1. ***Solve word problems leading to equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?***   **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| Students will learn to understand and find probability of simple events and represent sample spaces. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **What is probability?** * **How can the probability of an event help make predictions?** * **How is experimental probability similar to and different from theoretical probability?** * **How can a model be used to find the probability of an event?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• The way that data is collected,**  **organized and displayed influences**  **interpretation.**  **• The probability of an event’s**  **occurrence can be predicted with**  **varying degrees of confidence.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 4 –**  **Big Idea II: Determine outcomes, find probabilities, simulate compound events.**  **Topic: Probability** | | |
| **Standards:**  **7.SP.8**  Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.  a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.  b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., “rolling double sixes”), identify the outcomes in the sample space which compose the event.  c. Design and use a simulation to generate frequencies for compound events. *For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?*  **7.EE.3**  Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. ***For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.***  **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| Students will learn to determine outcomes, find probabilities, simulate compound events. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How can all the possible outcomes, or sample space, of a compound event be represented?** * **How can a model help find the probability of a compound event?** * **How can you use simulations to determine the probability of events?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• The way that data is collected,**  **organized and displayed influences**  **interpretation.**  **• The probability of an event’s**  **occurrence can be predicted with**  **varying degrees of confidence.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 4 –**  **Big Idea III: Draw geometric figures and solve problems involving scale drawings, angle relationships, and circumference of a circle.**  **Topic: Solve Problems Involving Geometry** | | |
| **Standards:**  Draw, construct, and describe geometrical figures and describe the relationships between them.  **7.G.1**  Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.    **7.G.2**  Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.  **7.G.5**  Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.  **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| Students will learn to draw geometric figures and solve problems involving scale drawings, angle relationships, and circumference of a circle. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How do scale drawings and actual measurements represent proportional relationships?** * **How can a shape that meets given conditions be drawn?** * **How can you determine when it is possible to draw a triangle given certain conditions?** * **How are angles formed by intersecting lines related?** * **How is the circumference of a circle related to the length of the diameter?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• Geometry and spatial sense offer ways**  **to interpret and reflect on our physical**  **environment.**  **• Analyzing geometric relationships**  **develops reasoning and justification**  **skills.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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| **QUARTER 4 –**  **Big Idea IV: Solve problems involving area of a circle, surface area, and volume. Describe cross sections.**  **Topic: Solve Problems Involving Geometry** | | |
| **Standards:**  Draw, construct, and describe geometrical figures and describe the relationships between them.  **7.G.1**  Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.    **7.G.2**  Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.  **7.G.3**  Describe the two-dimensional figures that result from slicing three- dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.  **7.G.4**  Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.  **7.G.6**  Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.  **7.EE.3**  Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. ***For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.***  **CRP2.** Apply appropriate academic and technical skills.  **CRP4.** Communicate clearly and effectively and with reason.  **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.  **CRP11.** Use technology to enhance productivity. | **GOAL** | |
| Students will learn to solve problems involving area of a circle, surface area, and volume. | |
| **Essential Questions Assessments** | |
| **Essential Questions:**   * **How can the area formula for a circle be used to solve problems?** * **How do the faces of a three-dimensional figure determine the two-dimensional shapes created by slicing the figure?** * **How is finding the area of composite two-dimensional figures similar to finding the surface area of three-dimensional figures?** * **How does the formula for volume of a prism help you understand what volume of a prism means?** | **Assessments:**   * **Mid-Topic Checkpoint** * **Mid-Topic performance Task** * **Lesson Quiz** * **Topic Assessment** * **Topic Performance Assessment** |
| **Enduring Understanding Resources** | |
| **Enduring Understanding:**  **• Geometry and spatial sense offer ways**  **to interpret and reflect on our physical**  **environment.**  **• Analyzing geometric relationships**  **develops reasoning and justification**  **skills.** | **Resources:**  **EnVision Math 2.0 workbook**  **PearsonRealize.com**  **Additional practice workbook**  **Khanacademy.com** |
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**Grade 7**

**COURSE BENCHMARKS**

**At the end of grade 7 students will be able to:**

1.Apply and extend previous understandings of operations with fractions.

2.Analyze proportional relationships and use them to solve real-world and mathematical problems.

3.Use properties of operations to generate equivalent expressions.

4.Solve real-world and mathematical problems using numerical and algebraic expressions and equations.

5.Use random sampling to draw inferences about a population.

6.Draw informal comparative inferences about two populations.

7.Investigate change processes and develop, use, and evaluate probability models.

8.Draw, construct, and describe geometrical figures and describe the relationships between them.

9.Solve real-world and mathematical problems involving angle measures, area, surface area, and volume.