7TH GRADE MATH

PACING GUIDE 2021-2022

Back to In-class teaching

August 20, 2021

7th GRADE MATH PLC

WAPATO MIDDLE SCHOOL

Agile Mind Mathematics 7 Scope and Sequence,

Common Core State Standards for Mathematics

In Grade 6, students developed an understanding of variables from two perspectives—as placeholders for specific values and as representing sets of values represented in algebraic relationships. They applied properties of operations to write and solve simple one-‑step equations. By the end of Grade 6, students were fluent in all positive rational number operations, and they developed a solid foundation for understanding area of polygons and surface area and volume of rectangular prisms. The Grade 7 course outlined in this scope and sequence document builds on Grade 6 work by extending students' understanding of ratio to a more formal understanding of rate and its application with percents. Students extend their understanding of operations with rational numbers to include negative rational numbers. Students then continue the work they started in Grade 6 in writing expressions and equations, laying the groundwork for their Grade 8 work with functions. The course then turns to more formal methods for writing and solving multi-‑step equations and inequalities. Students also build on the Grade 6 work with proportional reasoning as they learn to scale 2-‑dimensional figures and to apply proportional reasoning to probability and statistical situations. Students extend their work with area to include circles and extend their work with 3-‑dimensional shapes to include the surface area and volume of shapes composed of polygons, including right prisms and pyramids. They investigate the 2-‑dimensional figures that result from slicing 3-‑ dimensional figures. The course also lays the groundwork for high school Geometry as students investigate informal proofs of key geometric relationships among triangles.

Throughout this Grade 7 course, students should continue to develop proficiency with the eight Standards for Mathematical Practice:

1. Make sense of problems and persevere in problem solving. **2. Reason abstractly and quantitatively.** **3. Construct viable arguments and critique the reasoning of others.** **4. Model with Mathematics.**	**5. Use appropriate tools strategically.** **6. Attend to precision.** **7. Look for and make use of structure.** **8. Look for and express regularity in repeated reasoning.**

These practices should become the natural ways in which students come to understand and do mathematics. While, depending on the content to be understood or on the problem to be solved, any practice might be seen or applied, some practices may prove more useful than others.

8 Mathematical Teaching Practices: ***Principles to Action (Agile Mind Training, August 2018)***

1. Establish mathematics goals to focus learning.
2. Implement tasks that promote reasoning and problem solving.
3. Use and connect mathematical representations.
4. Facilitate meaningful mathematical discourse.
5. Pose purposeful questions.
6. Build procedural fluency from conceptual understanding.
7. Support productive struggle in learning mathematics.
8. Elicit and use evidence of student thinking

Agile Mind Topics	Time allotment (1 block is equivalent to 45 mins.)	Topic Descriptions	Common Core State Standards for Mathematical Content · Standards listed in black are the primary instructional focus of the topic. Standards in gray support topic content or indicate foundations for future work.
Proportional Relationships ***T1-Scaling images*** **09/02/21 - 09/24/21** **** 09/02 & 09/03 classroom and school procedures and expectations.** **09/06/21-09/10/21** ***09/06- No School*** **09/07/21** **Pre-Benchmark (Galileo)** **09/08/21** **Pre-test for T1-3 (AM Interim)** **09/09/21** **T1B1-Vocab & Overview** **09/10/21** **Block 2** **09/13/21-09/17/21** **Block 3,4,5,7,8** **09/20/21-09/23/21** **Block 9, 6 (MARS)** **Review - More Practice Questions** ***09/23/21 - Post test***	**11 Blocks**	**This topic, Using ratios, explores and applies proportional reasoning through multiple representations. Understanding and applying proportional relationships is a focus of grade 7. Students will use proportional relationships in this topic to solve problems, including problems involving scaled images, maps, blueprints, and mixtures. Real-world applications engage students to explore and make reasonable conjectures while testing their predictions. Later in this course, students will continue to study proportional relationships using graphs and equations. In this topic, the focus is on proportional reasoning and problem solving and beginning to use equations to describe relationships.**	**Ratios and Proportional Relationships —7.RP** **A. Analyze proportional relationships and use them to solve real-world and mathematical problems.** **3. Use proportional relationships to solve multistep ratio problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*** **The Number System — 7.NS** **A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.** **3. Solve real-world and mathematical problems involving the four operations with rational numbers.[1]** **NOTE: [1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions.** **Expressions and Equations —7.EE** **B. Solve real-life and mathematical problems using numerical and algebraic expressions and equations.** **3. Solve multi-step real-life and mathematical problems posed with positive rational numbers in any form (whole numbers, fractions), using tools strategically. Apply properties of operations to calculate with numbers in any form; 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.*** **Geometry — 7.G** **A. Draw, construct, and describe geometrical figures and describe the relationships between them.** **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.**

Proportional Relationships ***T2: Ratios and Rates*** **09/24/21-10/06/21** **09/24** **T2B1-Overview & Vocab** **09/27/21- 10/01/21** **Block 2, 3(CR1), 4, 5, 6** **10/04/21- 10/05/21** **Block 7** **Topic review-More Practice questions** ***10/06/21 - Post test***	**9 BLOCKS** **SBA tentative Date in October. This will move all dates accordingly.**	**This topic, Ratios and rates, is designed to build upon students' prior knowledge involving proportional reasoning. This includes the concepts of ratio, rates, and proportions. Students learn that a unit rate is a comparison of two quantities (such as distance per time, distance per gallon, or dollars per gallon) in which one of the measures is 1 unit. This is an important foundation for future work with the concept of rate of change of a function. Students use unit rates to determine or compare measurements. Ratios are revisited especially in the area of scaling. Students also learn about the constant of proportionality in a relationship.**	**Ratios and Proportional Relationships —7.RP** A. Analyze proportional relationships and use them to solve real-‐world and mathematical problems. 1. Compute unit rates associated with ratios of fractions, including ratios of lengths, 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.* 2. Recognize and represent proportional relationships between quantities. 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.* **The Number System — 7.NS** A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. 3. Solve real-‐world and mathematical problems involving the four operations with rational numbers.[1] NOTE: [1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions. **Expressions and Equations —7.EE** B. Solve real-‐life and mathematical problems using numerical and algebraic expressions and equations. 3. Solve multi-‐step real-‐life and mathematical problems posed with positive 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.* **Geometry — 7.G** **A. Draw, construct, and describe geometrical figures and describe the relationships between them.** **Solve problems involving scale drawings of geometric figures, including computing actual lengths from a scale drawing and reproducing a scale drawing at a different scale.**

Proportional Relationships **T3: Patterns in Proportional relationships** **10/07/21 - 10/25/21** **10/07/21** **T3B1-Overview and Vocab** ***10/08/21-Friday*** ***No school*** **10/11/21-10/15/21** **Block 2,3,4** **10/18/21-10/22/21** **Block 5,6,7** **B8-Mars task** **T3- Review** **10/25/21 - Post test**	**10 BLOCKS** **PTC** **10/13/21** **10/15/21** **Half day schedule**	**This topic, Patterns in proportional relationships, is designed to build on students' prior knowledge involving ratios, rates, and proportional reasoning developed in previous topics. Students will learn how to analyze relationships using tables and graphs, and develop algebraic equations that describe the relationships. Students will also explore various patterns, developing skills to predict future iterations of a pattern by developing equations. The ability to analyze relationships will be valuable in future topics as students continue to explore relationships using multiple representations.**	**Ratios and Proportional Relationships —7.RP** A. Analyze proportional relationships and use them to solve real-‐world and mathematical problems. 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. **Expressions and Equations —7.EE** B. Solve real-‐life and mathematical problems using numerical and algebraic expressions and equations. 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 where p, q, and r are specific rational numbers. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width*?

FRACTIONS, DECIMALS, & PERCENT **T4: Applications of percents** **10/26/21 - 11/13/21** **10/26/21** **Pre-test(AM interim) & vocab** **10/27/21-10/29/21** **Block 1,2,3** **11/01/21-11/05/21** **Block 4-9** **(Block 5 skipped)** **Block 4 - Mars: 25% sale** **11/08/21-11/12/21** **Block 10-MARS: Fudge** **Block 11** **11/10/21 review** **11/11/21 - No school** **11/12/21- Post test**	**12 BLOCKS**	**This topic investigates the various uses of percent in solving real-world problems. Applications include discounts, markups, increases and decreases in value, fees, commissions, percent error, tips, and simple and compound interest calculations. In addition to percentages, this topic offers significant review of proportional reasoning.** **A common thread in this topic—making connections among various representations of percents—will help students understand how percents are related to their earlier experiences with proportional reasoning. The lemonade examples in *Exploring*"Applying percents to business situations" introduce mixture problems, which students will likely encounter in later courses.**	**Ratios and Proportional Relationships —7.RP** A. Analyze proportional relationships and use them to solve real-‐world and mathematical problems. 3. Use proportional relationships to solve multi-step percent problems. *Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.* **The Number System — 7.NS** A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. 3. Solve real-‐world and mathematical problems involving the four operations with rational numbers.[1] NOTE: [1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions. **Expressions and Equations —7.EE** B. Solve real-‐life and mathematical problems using numerical and algebraic expressions and equations. 3. Solve multi-‐step real-‐life and mathematical problems posed with positive 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*

T5: Adding and subtracting integers **11/15/21 - 11/23/21** **11/15/21-11/19/21** **11/15/21** **Pre-Test 5-7 (AM Interim)** **11/15/21** **T5B1 Overview & vocab** **11/16/21-11/19/21** **Block 2 Algebra tiles** **Block 3-4 Horizontal line** **Block 5-6 Vertical line** **11/22/21-11/23/21** **11/22/21 - Review** **11/23/21 - Post test**	**7 BLOCKS** **Thanksgiving** **11/24-11/26**	**The topic Adding and subtracting integers focuses on the models that represent integers. Students build on their understanding of integers (including opposites and absolute value) and their relation to rational numbers, including their position on the number line. They investigate integers in multiple contexts. They learn to add and subtract integers using a variety of models, including number line and tiles. Students are given multiple opportunities to practice thus building proficiency with addition and subtraction of integers. Later in the course, students will extend this understanding to positive and negative rational numbers and apply their skills in solving equations.**	**The Number System — 7.NS** A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. 1. 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. a. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.* 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. Apply properties of operations as strategies to add and subtract rational numbers.
T6: Multiplying and dividing integers **11/29/21 - 12/09/21** **11/29/21-Vocab & overview** **11/30/21-12/03/21** **Block 2,3,4,5** **12/06/21-12/09/21** **Block 6&7** **12/08** **Topic review** **12/09/21 - Post test**	**8 BLOCKS**	**This topic builds on students' work with properties of operations to develop rules for operating with products and quotients of signed numbers. It provides numerous opportunities for students to build fluency with integer operations. Students have had previous experiences with combinations of addition, subtraction, multiplication, and division in solving problems. This topic includes exponentiation. Framing the use of exponents in real world contexts helps students to make the connection that exponents should be simplified before any additional operations occur.**	**The Number System — 7.NS** A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. 2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 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. 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‑‑ Apply properties of operations as strategies to multiply and divide rational numbers.

T7: Rational Numbers **12/10/21 - 01/07/22** **12/10/21** **T7B1-Vocab & overview** **12/13/21-12/17/21** **Block 2,3,4,5,6** **01/03/22 - 01/07/22** **01/03 Review** **01/04-01/05 Block 7 & 8** **01/06 Topic review** **01/07/22 - Post test**	**9 BLOCKS** **Christmas Break** **12/22-01/02**	**This topic, Rational numbers, builds on students' prior work with applying properties of operations to solve problems with positive fractions, decimals, and integers. Students will solve real-world and mathematical problems involving the four operations with positive and negative rational numbers including negative fractions and decimals. Students are given multiple opportunities to practice these skills and build their numerical fluency using these operations.**	**Ratios and Proportional Relationships —7.RP** A. Analyze proportional relationships and use them to solve real-‑world and mathematical problems. 1. Compute unit rates associated with ratios of fractions, including ratios of 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.* **Expressions and Equations —7.EE** B. Solve real-‑life and mathematical problems using numerical and algebraic expressions and equations. 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.* **The Number System — 7.NS** A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. 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. a. Describe situations in which opposite quantities combine to make 0. *For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.* 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. 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). apply this principle in real-‑world contexts. d. Apply properties of operations as strategies to add and subtract rational numbers. 2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 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. 3. Solve real-‑world and mathematical problems involving the four operations with rational numbers.[1] NOTE: [1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions

EQUATIONS AND INEQUALITIES **T8: Equations and Inequalities** **01/10/22 - 01/28/22** **01/10/22- 01/14/22** **01/10** **T8 Pre-test (AM Interim) & Vocab** **01/11-01/14** **Block 1,2,3,4** **01/17/22-01/21/22** **01/17 No School** **01/18-01/21** **Block 5,6 (CR 1&2), 8, 10 (CR3)** **01/24/22-01/25/22** **Topic review** **01/25/22 - Post test**	**13 BLOCKS**	**This topic, Equations and inequalities, is designed to build on students' prior knowledge of creating and solving one-step equations and creating equations in the forms of *px + q = r* and *p(x + q) = r*. Students will learn how to use equations and manipulate expressions to solve word problems using the Distributive Property, as well as represent these equations using balance scales and algebra tiles. Throughout the topic, students are provided practice problems to strengthen their fluency in manipulating expressions and solving equations. Students will also build on their knowledge of inequality to represent word problems with more complex statements of inequality while displaying the solution sets of these statements on a number line.**	**Expressions and Equations —7.EE** A. Use properties of operations to generate equivalent expressions. 1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. 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."* B. Solve real-‑life and mathematical problems using numerical and algebraic expressions and equations. 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.* 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? 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.

Data analysis and Probability **T9: Probability** **01/26/22 - 02/15/22** **01/26 Pre test (AM 9-10 Interim)** **01/27 Overview & Vocab** **01/28 Block 2** **01/31 - 02/04** **Block 3,4,5 (plus CR1)** **Block 6 MARS: Counters** **Block 7 Compound events** **02/07 - 02/11** **Block 8** **Block 9 MARS: Duck game** **Block 10** **Block 11 (plus CR 2)** **Block 13 CR 3** **02/14 - 02/18** **2/14 Summary Review** **02/15/22 - Post test**	**14 BLOCKS** **Quarter 2 ends on 1/28** **Need 3 color marbles for b10** **02/18 & 2/21 NO SCHOOL**	**This topic, Probability, investigates the probability of simple and compound events through several different models. Games of a probabilistic nature are developed as tools to test conjectures and the idea of fairness. Vocabulary and appropriate terminology are emphasized throughout the topic. Make sure that you allow enough time for conducting experiments, gathering data, and analyzing results.**	***Ratios and Proportional Relationships —7.RP*** ***A. Analyze proportional relationships and use them to solve real-world and mathematical problems.*** ***3. Use proportional relationships to solve multistep ratio problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.*** *The Number System — 7.NS* *A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.* *3. Solve real-world and mathematical problems involving the four operations with rational numbers.[1]* *NOTE: [1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions.* *Expressions and Equations —7.EE* *B. Solve real-life and mathematical problems using numerical and algebraic expressions and equations. Solve multi-step real-life and mathematical problems posed with positive 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.* **Statistics and Probability — 7.SP** **C. Investigate chance processes and develop, use, and evaluate probability models.** **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.** **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. 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?** **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 that 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?***

T10: Representing and interpreting data **Dates** **02/16 - 03/04** **02/16 - Overview & Vocab** **02/17 Block 2** **02/22 - 02/25** **Block 3 MARS: Animals, 5, 6 (plus CR1), 7** **02/28 - 03/04** **Block 8 MARS: Best Guess, 9, 10** **03/03 Topic Review** **03/04 - Post Test**	**11 BLOCKS** **02/18 NO SCHOOL/ SNOW DAY** **02/21 NO SCHOOL**	**In the topic, Representing and interpreting data, the visual displays are connected to the numerical measures of central tendency and variability, thereby supporting students in their understanding of the conceptual connections between the picture (graph) and numerical values (mean, median, mode, interquartile range, and mean absolute deviation). The topic leads students from the collection of data through the analysis and interpretation of results. Students analyze the visual overlap of two distributions and make inferences about populations from samples. Although the *Exploring* "Misleading graphs" is not focused on primary standards of the grade, it has strong connections to the ideas of ratio and area.**	**Ratios and Proportional Relationships —7.RP** A. Analyze proportional relationships and use them to solve real-‑world and mathematical problems. 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.* **The Number System — 7.NS** A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. 3. Solve real-‑world and mathematical problems involving the four operations with rational numbers.[1] NOTE: [1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions. **Statistics and Probability — 7.SP** A. Use random sampling to draw inferences about a population. 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. 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.* B. Draw informal comparative inferences about two populations. 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.* 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*

T12: Angles and triangles **03/07 - 03/25** **03/07 - Pre Test T 12-14 (AM Interim)** **Overview and Vocab** **03/07 - 03/11** **Overview & Vocab** **Block 2, 3, 4 (plus CR1),** **03/14 - 03/18** **Block 5 - 7** **03/21 Topic Review** **03/22 - Post test** **03/23 - 04/01 Built in Flex Days** **Review/Reteach Topic 1-8 or PBL Project Based Learning**	**8 BLOCKS** **PTC** **03/16,17,18**	**The content in this topic, Angles and triangles, provides students an opportunity to investigate angle relationships found among vertical, adjacent, complementary, and supplementary angles, as well as angle relationships found among the interior angles of triangles. In solving geometric problems, students make use of their knowledge of writing and solving equations and strengthen fluency with equations. Students also investigate conditions required to form a triangle, including whether or not a given set of three measures (combination of side lengths and angle measures) determines no triangle, a unique triangle, or multiple triangles. This preliminary study lays the foundation for subsequent studies into triangle congruence theorems. Mathematical practices that are emphasized in this topic include making sense of problems and persevere in solving them, modeling with mathematics, using appropriate tools strategically, and looking for and express regularity in repeated reasoning. While these practices are emphasized, there are opportunities in this topic to address all of the mathematical practices.**	**Expressions and Equations —7.EE** B. Solve real-‑life and mathematical problems using numerical and algebraic expressions and equations. 3. Solve multi-‑step real-‑life and mathematical problems posed with positive rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form. *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.* 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*? **Geometry — 7.G** **A. Draw, construct, and describe geometrical figures and describe the relationships between them.** **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.** **B. Solve real-‑life and mathematical problems involving angle measure, area, surface area, and volume.** **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.**

T13: Solving problems with 2-D shapes **Dates** **04/11 - 04/26** **04/11-04/15** **04/11 - Overview and Vocab** **Block 2 - 5** **04/18 - 04/22** **Block 6-8 (all 3 CR) AM Practice** **04/25 - Review / Flex** **04/26 - Post test**	**9 BLOCKS** **Quarter 3 ends 4/13**	**This topic, <u>Solving problems with 2-D shapes</u>, builds on students' understanding from earlier courses of area and perimeter of triangles and quadrilaterals. Students will deepen these understandings as they develop formulas for areas of special quadrilaterals, and as they investigate area and perimeter (circumference) of circles. In a content area like geometry, it is helpful for students to have many opportunities to explore, investigate, and interact with classmates. It is critical to students' learning that they make conjectures and predictions, and then test them.**	**The Number System — 7.NS** A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. 3. Solve real--world and mathematical problems involving the four operations with rational numbers.[1] NOTE: [1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions. **Expressions and Equations —7.EE** B. Solve real--life and mathematical problems using numerical and algebraic expressions and equations. 3. Solve multi--step real--life and mathematical problems posed with positive 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*. 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*? **Geometry — 7.G** B. Solve real--life and mathematical problems involving angle measure, area, surface area, and volume. 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. 6. Solve real--world and mathematical problems involving area, of two-- dimensional objects composed of triangles, quadrilaterals, polygons, scale.

T14: Prisms, pyramids, & plane sections **Dates** **04/27 - 05/08** **WED 04/27 - Overview and Vocab** **04/28 - 04/29** **Block 2-3** **05/02 - 05/06** **Block 4, 5, 6 (CR1)** **05/05 -Topic Review** **05/06 - Post test** **05/31 - 06/03** **Expressions and Equations Project** **06/06 - 06/09** **Geometric Sense Project** **06/13 - 06/17** **Ratios & Rate Project**	**8 BLOCKS** **Tentative test dates for SBA testing** **05/09 - 05/26**	**This topic, <u>Prisms, pyramids, and plane sections,</u> connects the visual model (nets) of prisms and pyramids with area, volume, and lateral and surface areas. Connections between pyramids and prisms and their volumes are also explored. Real-world examples of these shapes are used as models. Plane sections are introduced and students investigate slices with a variety of 3-dimensional shapes. This topic builds on the work of previous courses, finding surface area and volume of prisms through nets. It also begins work with plane sections that will be continued in future courses through the study of conic sections.** **Advanced Math 7 In Preparation for Algebra** **1.Transformations,** **2. Pythagorean Theorem,** **3. Cylinders, Cones, Spheres** **4. Real Numbers**	***The Number System — 7.NS*** *A. Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.* *3. Solve real-‑world and mathematical problems involving the four operations with rational numbers.[1]* *NOTE: [1] Computations with rational numbers extend the rules for manipulating fractions to complex fractions.* ***Expressions and Equations —7.EE*** *B. Solve real-‑life and mathematical problems using numerical and algebraic expressions and equations.* *3. Solve multi-‑step real-‑life and mathematical problems posed with positive 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.* **Geometry — 7.G** A. Draw, construct, and describe geometrical figures and describe the relationships between them. 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. 6. Solve real-‑world and mathematical problems involving volume and surface area of three-‑dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.