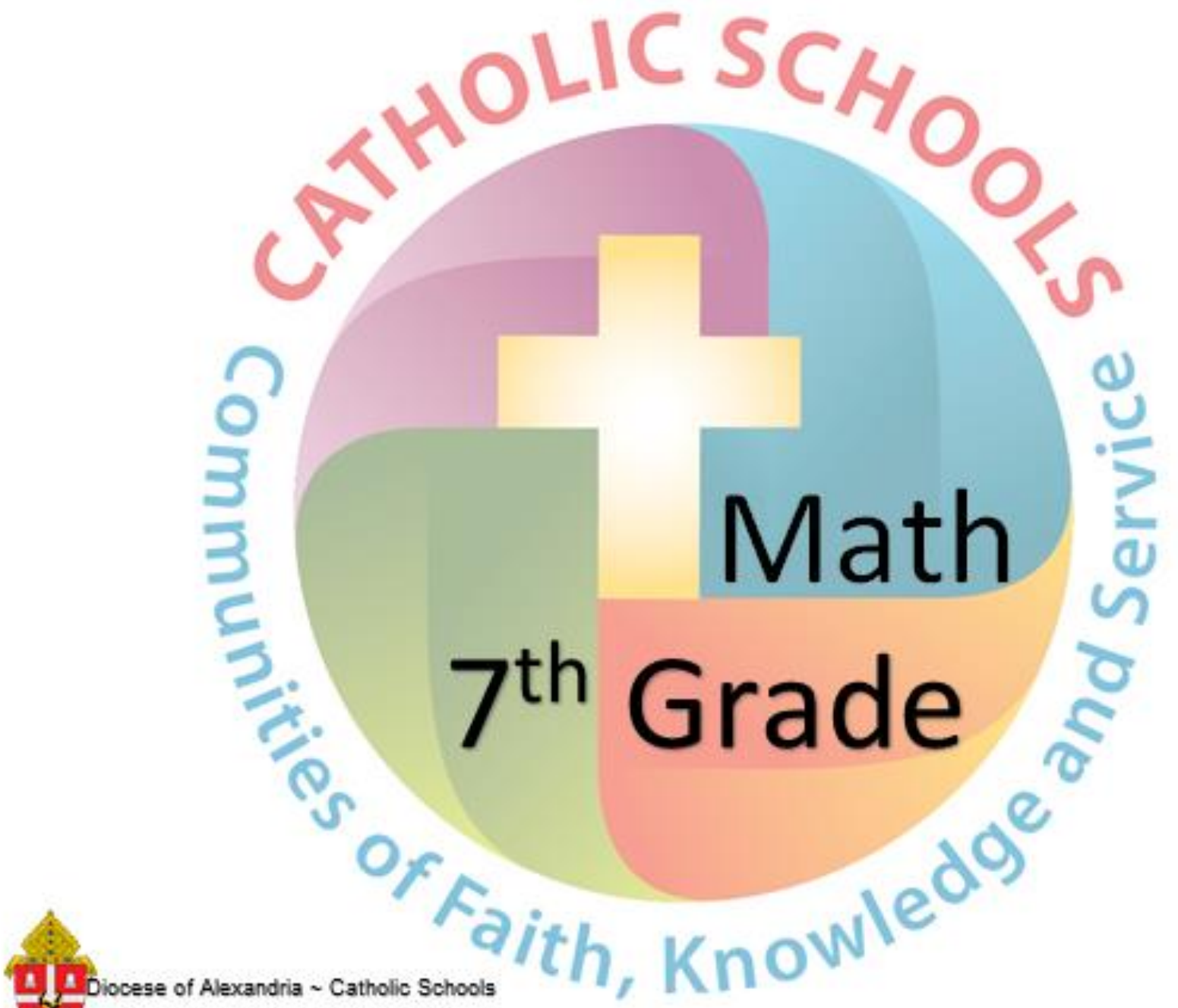

Diocese of Alexandria ~ Catholic Schools

Where faith and knowledge grow

DIOCESE OF ALEXANDRIA

As the Diocese of Alexandria seeks to provide a comprehensive learning environment, we are charged to "Teach More" by showing how all learning flows from and relates to our Creator. In this way, we will give our teaching a deeper meaning and purpose than simply the content itself. With this as our goal, the Catholic Schools Office has intertwined our selected curricular standards with the Catholic Standards developed by the Cardinal Newman Society. Through the merging of these two curricula, English Language Arts, Mathematics, Science, and Social Studies, teachers will be provided a roadmap to guide student's understanding and recognition of the relationship between learning and the connection to our God.

Thomas E. Roque, Sr.
Superintendent of Catholic Schools

Through comprehensive review of curricula from high performing districts throughout the United States in combination with parochial schools and Newman Cardinal Standards, the Curriculum Team for the Diocese of Alexandria has generated curricula for English Language Arts, Mathematics, Science, and Social Studies. The development of this framework is designed to guide the instructional path of teachers as they focus on the formation of their students in the areas of faith, academic excellence, responsible citizenry, and effective communication and collaboration. This process is a continuous improvement process with no defined beginning or end.

Barbara Forest, M.A.
Courtney Gistorb, M.Ed.

Denese Carter, M.Ed.
Tracy Bock, Ed.S.

Frameworks

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HOW TO USE

The frameworks are guides to instruction. The frameworks assist teachers in planning and pacing instruction. Specific dates or weeks that may be included in this document are for reference. Each school and teacher must consider the make-up of their students, focusing on the needs and strengths of each child when pacing and planning instruction.

The cycles for the year help pace instruction and ensure students have consistent coverage of the content. The duration (the suggested amount of time to spend on each cycle) does not accommodate for the scheduling of special events, inclement weather or school events. Teachers, with principal guidance, should adjust pacing as needed to accommodate for these events.

RESEARCH-BASED HIGH-YIELD PRACTICES FOR INSTRUCTION

These strategies have proven effective in affecting student learning and achievement gains. As you plan daily instruction, consider how and where to integrate these strategies into the instructional sequence. Effect size is in parentheses. Please refer to the works of John Hattie for a complete description of instructional effect size.

- Classroom Discussion/Discourse (.82)
- Teacher Clarity/making the learning visible with expectations for learning (.75)
- Reciprocal Teaching (.74)
- Feedback (.73)
- Metacognitive Strategies (.69)

Student focusAreas

Essential Questions
• *How does mathematics help us understand God's creation?* • *How does the use of math help us to understand the importance of clarity, reality, and goodness?* • *How do we solve addition and subtraction sentences to solve real world problems with and without concrete objects?* • *What are the ethical, moral, and legal implications of Internet use?* • *How does the study of mathematics enable us to understand, communicate, and live Gospel values?*

Catholic School – Mathematic Standards (CS.GS)	
CS.M.712.GS.1	Demonstrate the mental habits of precise, determined, careful, and accurate questioning, inquiry, and reasoning in pursuit of transcendent truths.
CS.M.712.GS.2	Develop lines of inquiry (as developmentally appropriate) to understand why things are true and why they are false.
CS.M.712.GS.3	Have faith in the glory and dignity of human reason as both a gift from God and a reflection of Him in whose image and likeness we are made.
CS.M.712.GS.4	Explain how mathematics in its reflection of the good, true, and beautiful reveals qualities of being and the presence of God.

7th Grade – Math

THE DIOCESE of ALEXANDRIA

Overview

Standards for Mathematical Content	Unit Focus	Standards for Mathematical Practice for ALL UNITS
Unit 1 Operations on Rational Numbers & Expressions 7.NS.A.1 7.NS.A.2 7.NS.A.3 7.EE.A.1 7.EE.A.2	• Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers • Use properties of operations to generate equivalent expressions	• 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.

Unit 1:
Suggested Open Educational Resources

7.NS.A.1 Comparing Freezing Points
7.NS.A.1b-c Differences of Integers
7.NS.A.2 Why is a Negative Times a Negative Always Positive
7.NS.A.2d Equivalent fractions approach to non-repeating decimals
7.NS.A.2d Repeating decimal as approximation
7.EE.A.1 Writing Expressions
7.EE.A.2 Ticket to Ride

7th Grade – Math

THE DIOCESE of ALEXANDRIA

Overview

Standards for Mathematical Content	Unit Focus
Unit 2 Equations and Ratio & Proportion 7.EE.B.3 7.EE.B.4 7.RP.A.1 7.RP.A.2 7.RP.A.3 7.G.A.1	• Solve real-life and mathematical problems using numerical and algebraic expressions and equations. • Analyze proportional relationships and use them to solve real-world and mathematical problems. • Draw, construct, and describe geometrical figures and describe the relationships between them.

Unit 2:
Suggested Open Educational Resources

7.EE.B.3 Discounted Books
7.EE.B.3 Shrinking
7.EE.B.4 Fishing Adventures 2
7.EE.B.4, 7.NS.A.1 Bookstore Account
7.EE.B.4b Sports Equipment Set
7.RP.A.1 Cooking with the Whole Cup
7.RP.A.2 Sore Throats, Variation 1
7.RP.A.2 Buying Coffee
7.RP.A.2c Gym Membership Plans
7.G.A.1 Floor Plan
7.G.A.1 Map distance

7th Grade – Math

THE DIOCESE of ALEXANDRIA

Overview

Standards for Mathematical Content	Unit Focus
Unit 3 Drawing Inferences about Populations & Probability Models ☐ 7.SP.A.1 ☐ 7.SP.A.2 ◎ 7.SP.B.3 ◎ 7.SP.B.4 ☐ 7.SP.C.5 ☐ 7.SP.C.6 ☐ 7.SP.C.7 ☐ 7.SP.C.8	• Use random sampling to draw inferences about a population. • Draw informal comparative inferences about two populations. • Investigate chance processes and develop, use, and evaluate probability models.

Unit 3:
Suggested Open Educational Resources

7.SP.A.1 Mr. Briggs Class Likes Math
7.SP.A.2 Valentine Marbles
7.SP.B.3,4 College Athletes
7.SP.B.3,4 Offensive Linemen
7.SP.C.6 Heads or Tails
7.SP.C.7, 6 Rolling Dice
7.SP.C.7a How Many Buttons
7.SP.C.8 Tetrahedral Dice
7.SP.C.8 Waiting Times

Standards for Mathematical Content	Unit Focus
Unit 4 Problem Solving with Geometry ◎ 7.G.B.4 ◎ 7.G.B.5 ◎ 7.G.B.6 ◎ 7.G.A.2 ◎ 7.G.A.3 ■ 7.EE.B.4 ■ 7.RP.A.3	• Solve real-life and mathematical problems involving angle measure, area, surface area, and volume. • Draw, construct, and describe geometrical figures and describe the relationships between them. • Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

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Overview

Unit 4:
Sample Open Educational Resources

7.G.B.4 Wedges of a Circle
7.G.B.4 Eight Circles
7.G.B.6, 7.RP.A.3 Sand under the Swing Set
7.G.A.2 A task related to 7.G.A.2
7.G.A.3 Cube Ninjas!
7.RP, 7.EE, 7.NS Drill Rig
7.RP.A.3, 7.EE.B.3,4 Gotham City Taxis

7th Grade – Math

THE DIOCESE of ALEXANDRIA

Unit 1 Grade 7 — **1st 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
7.NS.A.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. 7.NS.A.1a. Describe situations in which opposite quantities combine to make 0. *For example, In the first round of a game, Maria scored 20 points. In the second round of the same game, she lost 20 points. What is her score at the end of the second round?* 7.NS.A.1b. 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	MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments & critique the reasoning of others. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure.	**Concept(s):** • Opposite quantities combine to make 0 (additive inverses). • $p + q$ is the number located a distance $\|q\|$ from p, in the positive or negative direction depending on whether q is positive or negative. • Subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$ • The product of two whole numbers is the total number of objects in a number of equal groups. **Students are able to:** • represent addition and subtraction on a horizontal number line. • represent addition and subtraction on a vertical number line. • interpret sums of rational numbers in real-world situations. • show that the distance between two rational numbers on the number line is the absolute value of their difference. **Learning Goal 1**: Describe real-world situations in which (positive and negative) rational numbers are combined, emphasizing rational numbers that combine to make 0. Represent sums of rational numbers $(p + q)$ on horizontal and vertical number lines, showing that the distance along the number line is $\|q\|$ and including situations in which q is negative and positive. **Learning Goal 2:** Add and subtract (positive and negative) rational numbers, showing that the distance

7th Grade – Math

THE DIOCESE of ALEXANDRIA

Unit 1 Grade 7 — **1st 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
sums of rational numbers by describing real-world contexts. 7.NS.A.1c. 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. 7.NS.A.1d. Apply properties of operations as strategies to add and subtract rational numbers.		between two points on a number line is the absolute value of their difference and representing subtraction using an additive inverse.

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THE DIOCESE of ALEXANDRIA

Unit 1 Grade 7 — **1st 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
7.NS.A.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 7.NS.A.2a. 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. 7.NS.A.2b. Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.7 Look for and make use of structure.	**Concept(s):** • Every quotient of integers (with non-zero divisor) is a rational number. • Decimal form of a rational number terminates in 0s or eventually repeats. • Integers can be divided, provided that the divisor is not zero. • If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. **Students are able to:** • multiply and divide signed numbers. • use long division to convert a rational number to a decimal. **Learning Goal 3:** Multiply and divide signed numbers, including rational numbers, and interpret the products and quotients using real-world contexts. **Learning Goal 4:** Convert a rational number to a decimal using long division and explain why the decimal is either a terminating or repeating decimal.

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Unit 1 Grade 7 — **1st 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. 2c. Interpret quotients of rational numbers by describing real world contexts. 7.NS.A.2d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.		
■ 7.NS.A.3. Solve real-world and mathematical problems involving the four operations with rational numbers. ■ 7.NS.A.2. Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. 7.NS.A.2c. Apply properties of operations as strategies to multiply and divide rational numbers.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision.	**Concept(s):** • The process for multiplying and dividing fractions extends to multiplying and dividing rational numbers. **Students are able to:** • add and subtract rational numbers. • multiply and divide rational numbers using the properties of operations. • apply the convention of order of operations to add, subtract, multiply and divide rational numbers. • solve real world problems involving the four operations with rational numbers. **Learning Goal 5:** Apply properties of operations as strategies to add, subtract, multiply, and divide rational numbers.

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Unit 1 Grade 7 — **1st 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
		Learning Goal 6: Solve mathematical and real-world problems involving addition, subtraction, multiplication, and division of signed rational numbers.
■ 7.EE.A.1. Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. ■ 7.EE.A.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."*.	MP.2 Reason abstractly and quantitatively. MP.7 Look for and make use of structure.	**Concept(s):** • Rewriting an expression in different forms in a problem context can shed light on the problem. **Students are able to:** • add and subtract linear expressions having rational coefficients, using properties of operations. • factor and expand linear expressions having rational coefficients, using properties of operations. • write expressions in equivalent forms to shed light on the problem and interpret the relationship between the quantities in the context of the problem. **Learning Goal 7:** Apply the properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. **Learning Goal 8:** Rewrite algebraic expressions in equivalent forms to highlight how the quantities in it are related.

District/School Formative Assessment Plan	District/School Summative Assessment Plan
Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards.	*Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.*

7th Grade – Math

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Unit 2 Grade 7 — **2nd 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
7.EE.B.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.*	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.	**Concept(s):** • Rational numbers can take different forms. **Students are able to:** • solve multi-step real-life problems using rational numbers in any form. • solve multi-step mathematical problems using rational numbers in any form. • convert between decimals and fractions and apply properties of operations when calculating with rational numbers. • estimate to determine the reasonableness of answers. **Learning Goal 1:** Solve multi-step real life and mathematical problems with rational numbers in any form (fractions, decimals) by applying properties of operations and converting rational numbers between forms as needed. Assess the reasonableness of answers using mental computation and estimation strategies.

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Unit 2 Grade 7 — **2nd 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
7.EE.B.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. 7.EE.B.4a. Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?* 7.EE.B.4b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$,	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.	**Concept(s):** No new concept(s) introduced **Students are able to**: • compare an arithmetic solution to a word problem to the algebraic solution of the word problem, identifying the sequence of operations in each solution. • write an equation of the form px + q = r or p(x + q)=r in order to solve a word problem. • fluently solve equations of the form px + q = r and p(x + q)= r. • write an inequality of the form $px + q > r$, $px + q < r$, $px + q \geq r$ or $px + q \leq r$ to solve a word problem. • graph the solution set of the inequality. • interpret the solution to an inequality in the context of the problem. **Learning Goal 2:** Use variables to represent quantities in a real-world or mathematical problem by constructing simple equations and inequalities to represent problems. **Learning Goal 3:** Fluently solve equations; solve inequalities, graph the solution set of the inequality and interpret the solutions in the context of the problem (*Equations of the form $px + q = r$ and $p(x + q) = r$ and inequalities of the form $px + q > r$, $px + q \geq r$, $px + q \leq r$, or $px + q < r$, where p, q, and r are specific rational numbers).*

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Unit 2 Grade 7 **2nd 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
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.*		
7.RP.A.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 a complex fraction, equivalently 2 mph.*	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.6 Attend to precision.	**Concept(s):** No new concept(s) introduced **Students are able to:** • compute unit rates with ratios of fractions. • compute unit rates with ratios of fractions representing measurement quantities. in both like and different. units of measure. **Learning Goal 4**: Calculate and interpret unit rates of various quantities involving ratios of fractions that contain like and different units.

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Unit 2 Grade 7 — **2nd 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
7.RP.A.2. Recognize and represent proportional relationships between quantities. 7.RP.A.2a. Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin. 7.RP.A.2b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. 7.RP.A.2c. Represent proportional relationships by equations. *For example, if total cost t is proportional to the number n of items purchased at a*	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.	**Concept(s):** • Proportions represent equality between two ratios. • Constant of proportionality **Students are able to:** • use tables and graphs to determine if two quantities are in a proportional relationship. • identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. • write equations representing proportional relationships. • Interpret the origin and (1, r) on the graph of a proportional relationship in context. • interpret a point on the graph of a proportional relationship in context. **Learning Goal 5:** Determine if a proportional relationship exists between two quantities e.g. by testing for equivalent ratios in a table or graph on the coordinate plane and observing whether the graph is a straight line through the origin. **Learning Goal 6:** Identify the constant of proportionality (unit rate) from tables, graphs, equations, diagrams, and verbal descriptions. **Learning Goal 7:** Write equations to model proportional relationships in real world problems.

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Unit 2 Grade 7 **2nd 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
constant price p, the relationship between the total cost and the number of items can be expressed as t = pn. 7.RP.A.2d. 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.		**Learning Goal 8:** Use the graph of a proportional relationship to interpret the meaning of any point (x, y) on the graph in terms of the situation - including the points (0, 0) and (1, r), recognizing that r is the unit rate.
7.RP.A.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.*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. 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.	**Concept(s):** • Recognize percent as a ratio indicating the quantity *per one hundred.* **Students are able to:** • use proportions to solve multistep percent problems including simple interest, tax, markups, discounts, gratuities, commissions, fees, percent increase, percent decrease, percent error. • use proportions to solve multistep ratio problems. **Learning Goal 9:** Solve multi-step ratio and percent problems using proportional relationships (*simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error)*

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Unit 2 Grade 7 — **2nd 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
■ 7.RP.A.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.* ◎ 7.G.A.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.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. 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.	**Concept(s):** • Scale and proportion **Students are able to:** • use ratios and proportions to create scale drawings. • reproduce a scale drawing at a different scale. • computing actual lengths and areas from a scale drawing. • solve problems involving scale drawings using proportions. **Learning Goal 10:** Use ratio and proportion to solve problems involving scale drawings of geometric figures.

District/ School Formative Assessment Plan	District/School Summative Assessment Plan
Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards.	*Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.*

7th Grade - Math

THE DIOCESE of ALEXANDRIA

Unit 3 Grade 7 — **3rd 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
☐ 7.SP.A.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.	MP.3 Construct viable arguments & critique the reasoning of others. MP.6 Attend to precision.	**Concept(s):** • 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. • Random sampling tends to produce representative samples. **Students are able to:** • analyze and distinguish between representative and non-representative samples of a population. **Learning Goal 1:** Distinguish between representative and non-representative samples of a population (*e.g. if the class had 50% girls and the sample had 10% girls, then that sample was not representative of the population*).

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Unit 3 Grade 7 — **3rd 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
7.SP.A.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.*	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.6 Attend to precision.	**Concept(s):** • Inferences can be drawn from random sampling. • **Students are able to:** • analyze data from a sample to draw inferences about the population. • generate multiple random samples of the same size. • analyze the variation in multiple random samples of the same size. **Learning Goal 2:** Use random sampling to produce a representative sample. **Learning Goal 3:** Develop inferences about a population using data from a random sample and assess the variation in estimates after generating multiple samples of the same size.
7.SP.B.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*	MP.3 Construct viable arguments & critique the reasoning of others. MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	**Concept(s):** No new concepts introduced **Students are able to:** • locate, approximately, the measure of center (mean or median) of a distribution • visually assess, given a distribution, the measure of spread (mean absolute deviation or inter-quartile range). • visually compare two numerical data distributions and describe the degree of overlap. • measure or approximate the difference between the measures centers and express it as a multiple of a measure of variability.

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Unit 3 Grade 7 — **3rd 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
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.	MP.6 Attend to precision. MP.7 Look for and make use of structure.	**Learning Goal 4:** Visually compare the means of two distributions that have similar variability; express the difference between the centers as a multiple of a measure of variability.
7.SP.B.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.*	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.	**Concept(s):** No new concept(s) introduced **Students are able to:** • using measures of center, draw informal inferences about two populations and compare the inferences. • using measures of variability, draw informal inferences about two populations and compare the inferences. **Learning Goal 5:** Draw informal comparative inferences about two populations using their measures of center and measures of variability.

7th Grade - Math

THE DIOCESE of ALEXANDRIA

Unit 3 Grade 7 — **3rd 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
☐ 7.SP.C.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.	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.	**Concept(s):** • Probability of a chance event is a number between 0 and 1. • Probability expresses the likelihood of the event occurring. • Larger probability indicates greater likelihood. **Students are able to:** • draw conclusions about the likelihood of events given their probability. **Learning Goal 6:** Interpret and express the likelihood of a chance event as a number between 0 and 1, relating that the probability of an unlikely event happening is near 0, a likely event is near 1, and 1/2 is neither likely nor unlikely.
☐ 7.SP.C.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.*	MP.2 Reason abstractly and quantitatively. MP.1 Make sense of problems and persevere in solving them. MP.3 Construct viable arguments & critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically.	**Concept(s):** • Relative frequency • Experimental probability • Theoretical probability **Students are able to:** • collect data on chance processes, noting the long-run relative frequency. • predict the approximate relative frequency given the theoretical probability. **Learning Goal 7:** Approximate the probability of a chance event by collecting data and observing long-run relative frequency; predict the approximate relative frequency given the probability

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Unit 3 Grade 7 — **3rd 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
☐ 7.SP.C.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. 7.SP.C.7a. 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.* 7.SP.C.7b. . 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*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.6 Attend to precision.	**Concept(s):** • Uniform (equally likely) and non-uniform probability models. ***Students are able to:*** • develop a uniform probability model. • use a uniform probability model to determine the probabilities of events. • develop (non-uniform) probability models by observing frequencies in data that has been generated from a chance process. **Learning Goal 8:** Develop a uniform probability model by assigning equal probability to all outcomes; develop probability models by observing frequencies and use the models to determine probabilities of events; compare probabilities from a model to observed frequencies and explain sources of discrepancy when agreement is not good.

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Unit 3 Grade 7 — **3rd 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
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?		
☐ 7.SP.C.8. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. 7.SP.C.8a. 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. 7.SP.C.8b. 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	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.	**Concept(s):** • Just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space. **Students are able to:** • use organized lists, tables, and tree diagrams to represent sample spaces. • given a description of an event using everyday language, identify the outcomes in a sample space that make up the described event. • design simulations. • use designed simulations to generate frequencies for compound events. **Learning Goal 9:** Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams, identifying the outcomes in the sample space which compose the event. Use the sample space to find the probability of a compound event. **Learning Goal 10:** Design and use a simulation to generate frequencies for compound events.

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Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
event. 7.SP.C.8c. 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?*		

District/School Formative Assessment Plan	District/School Summative Assessment Plan
Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards.	*Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.*

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Unit 4 Grade 7 — **4th 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
7.G.B.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.	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.	**Concept(s):** • Circumference **Students are able to:** • solve problems by finding the area and circumference of circles. • show that the area of a circle can be derived from the circumference. **Learning Goal 1:** 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.B.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. 7.EE.B.4. Use variables to represent quantities in a real-world or mathematical problem,	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.	**Concept(s):** No new concept(s) introduced **Students are able to:** • use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations. • solve mathematical problems by writing and solving simple algebraic equations based on the relationships between and properties of angles (supplementary, complementary, vertical, and adjacent. **Learning Goal 2:** Write and solve *simple* multi-step algebraic equations involving supplementary, complementary, vertical, and adjacent angles.

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Unit 4 Grade 7 — **4th 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
and construct simple equations and inequalities to solve problems by reasoning about the quantities. 7.EE.B.4a. 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.		
7.G.B.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.	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.	**Concept(s):** No new concept(s) introduced **Students are able to:** • solve real-world and mathematical problems involving area of two dimensional objects composed of triangles, quadrilaterals, and polygons. • solve real-world and mathematical problems involving volume of three dimensional objects composed of cubes and right prisms. • solve real-world and mathematical problems involving surface area of three-dimensional objects composed of cubes and right prisms. **Learning Goal 3:** 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.

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Unit 4 Grade 7 — **4th 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
7.G.A.2. Draw (with technology, with ruler and protractor as well as freehand) 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	MP.3 Construct viable arguments & critique the reasoning of others. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	**Concept(s):** • Conditions for unique triangles, more than one triangle, and no triangle. **Students are able to:** • draw geometric shapes with given conditions, including constructing triangles from three measures of angles or sides. • recognize conditions determining a unique triangle, more than one triangle, or no triangle. **Learning Goal 4:** Use freehand, mechanical (i.e. ruler, protractor) and technological tools to draw geometric shapes with given conditions (e.g. scale factor), focusing on constructing triangles.
7.G.A.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.	MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure.	**Concept(s):** • Cross-sections of three-dimensional objects **Students are able to:** • analyze three dimensional shapes (right rectangular pyramids and prisms) by examining and describing all of the 2-dimensional figures that result from slicing it at various angles. **Learning Goal 5:** Describe all of the 2-dimensional figures that result when a 3-dimemsional figures are sliced from multiple angles.

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Unit 4 Grade 7 — **4th 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
7.EE.B.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. 7.EE.B.4a. 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?*	MP.2 Reason abstractly and quantitatively. MP.4 Model with mathematics. MP.6 Attend to precision. MP.7 Look for and make use of structure.	**Concept(s):** No new concept(s) introduced **Students are able to:** • write an equation of the form px + q = r or p(x + q)=r in order to solve a word problem. • fluently solve equations of the form px + q = r and p(x + q)= r. **Learning Goal 6:** Fluently solve simple equations of the form px + q = r and p(x + q) = r, where p, q, and r are specific rational numbers.

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Unit 4 Grade 7 — **4th 9 Weeks**

Content Standards	Suggested Standards for Mathematical Practice	Critical Knowledge & Skills
7.RP.A.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*	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. 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.	**Concept(s):** • Recognize percent as a ratio indicating the quantity *per one hundred.* **Students are able to:** • use proportions to solve multistep percent problems including simple interest, tax, markups, discounts, gratuities, commissions, fees, percent increase, percent decrease, percent error. • use proportions to solve multistep ratio problems. **Learning Goal 7:** Solve multi-step ratio and percent problems using proportional relationships (*simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error).*

District/School Formative Assessment Plan	District/School Summative Assessment Plan
Formative assessment informs instruction and is ongoing throughout a unit to determine how students are progressing against the standards.	*Summative assessment is an opportunity for students to demonstrate mastery of the skills taught during a particular unit.*

Ratios and Proportional Relationships (DOA.7.RP)

STANDARDS		ACT Reporting Category *ACT Knowledge and Skills*
Analyze proportional relationships and use them to solve real-world and mathematical problems		
DOA.7.RP.A.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 ½ mile in each ¼ hour, compute the unit rate as the complex fraction ½/¼ miles per hour, equivalently 2 miles per hour.*	**Ratios and Proportional Relationships** **Justification and Explanation** **Modeling** Ratios Proportions
DOA.7.RP.A.2	Recognize and represent proportional relationships between quantities.	
DOA.7.RP.A.2a	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.	
DOA.7.RP.A.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.	
DOA.7.RP.A.2c	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.*	
DOA.7.RP.A.2d	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.	
DOA.7.RP.A.3	Use proportional relationships to solve multi-step ratio and percent problems of simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, and percent error.	

The Number System (DOA.7.NS)

STANDARDS		ACT Reporting Category *ACT Knowledge and Skills*
Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers		
DOA.7.NS.A.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.	**The Number System** **Justification and Explanation** **Modeling** Extending Operations Rational Number Concepts & Operations
DOA.7.NS.A.1a	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.*	
DOA.7.NS.A.1b	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.	
DOA.7.NS.A.1c	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.	
DOA.7.NS.A.1d	Apply properties of operations as strategies to add and subtract rational numbers.	
DOA.7.NS.A.2	Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.	
DOA.7.NS.A.2a	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.	
DOA.7.NS.A.2b	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.	
DOA.7.NS.A.2c	Apply properties of operations as strategies to multiply and divide rational numbers.	
DOA.7.NS.A.2d	Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.	
DOA.7.NS.A.3	Solve real-world and mathematical problems involving the four operations with rational numbers.[1]	

Expressions and Equations (DOA.7.EE)

STANDARDS		ACT Reporting Category *ACT Knowledge and Skills*
Use properties of operations to generate equivalent expressions		
DOA.7.EE.A.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients to include multiple grouping symbols (e.g., parentheses, brackets, and braces).	**Expressions & Equations** **Justification and Explanation** **Modeling** Expressions Linear Equations
DOA.7.EE.A.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."*	
Solve real-life and mathematical problems using numerical and algebraic expressions and equations		
DOA.7.EE.B.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.*	**Expressions & Equations** **Justification and Explanation** **Modeling** Expressions Linear Equations
DOA.7.EE.B.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.	
DOA.7.EE.B.4a	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?*	
DOA.7.EE.B.4b	Solve word problems leading to inequalities of the form $px + q > r$, $px + q \geq r$, $px + q < r$ or $px + q \leq r$, 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.*	

Geometry (DOA.7.G)

STANDARDS		ACT Reporting Category *ACT Knowledge and Skills*
Draw, construct, and describe geometrical figures and describe the relationships between them.		
DOA.7.G.A.1	Solve problems involving scale drawings of geometric figures, such as computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.	**Geometry** **Justification and Explanation** **Modeling** Figures and Their Properties Measurement of Figures
DOA.7.G.A.2	Draw (freehand, with ruler and protractor, or with technology) geometric shapes with given conditions. (Focus is on triangles from three measures of angles or sides, noticing when the conditions determine one and only one triangle, more than one triangle, or no triangle.)	
DOA.7.G.A.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.	
Solve real-life and mathematical problems involving angle measure, area, surface area, and volume		
DOA.7.G.B.4	Know the formulas for the area and circumference of a circle and solve problems; give an informal derivation of the relationship between the circumference and area of a circle.	**Geometry** **Justification and Explanation** **Modeling** Figures and Their Properties Measurement of Figures
DOA.7.G.B.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and use them to solve simple equations for an unknown angle in a figure.	
DOA.7.G.B.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. (Pyramids limited to surface area only.)	

Statistics and Probability (DOA.7.SP)		
STANDARDS		**ACT Reporting Category** ***ACT Knowledge and Skills***
Use random sampling to draw inferences about a population		
DOA.7.SP.A.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.	**Statistics and Probability** **Justification and Explanation** **Modeling** Descriptive Statistics Inferential Statistics Probability
DOA.7.SP.A.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.*	
Draw informal comparative inferences about two populations		
DOA.7.SP.B.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities using quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.	**Statistics and Probability** **Justification and Explanation** **Modeling** Descriptive Statistics Inferential Statistics Probability
DOA.7.SP.B.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.*	

Statistics and Probability (DOA.7.SP) continued…

STANDARDS		ACT Reporting Category *ACT Knowledge and Skills*
Investigate chance processes and develop, use, and evaluate probability models		
DOA.7.SP.C.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 ½ indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.	**Statistics and Probability** **Justification and Explanation** **Modeling** Descriptive Statistics Inferential Statistics Probability
DOA.7.SP.C.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.*	
DOA.7.SP.C.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.	
DOA.7.SP.C.7a	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.*	
DOA.7.SP.C.7b	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?*	
DOA.7.SP.C.8	Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.	
DOA.7.SP.C.8a	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.	
DOA.7.SP.C.8b	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.	
DOA.7.SP.C.8c	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?*	