Appendix IV B: SpringBoard Math Unit-At-a-Glance: Course 2

SpringBoard Math Unit- At-a-Glance– Course 2: Common Core Edition © 2014

Unit 1- Number Systems

Prerequisite Skills
- Perform operations with rational numbers (Items 1, 2, 3) 6.NS.B.2, 6.NS.B.3, 7.NS.A.1, 7.NS.A.2.c
- Understand properties of numbers (Item 4) 7.EE.A.1
- Use visual representations (Items 5, 8) 6.NS.C.6
- Understand absolute value (Item 7) 6.NS.C.7
- Order fractions and decimals (Item 6) 6.NS.C.7

Materials:
Paper clips; standard ruler, measuring tape, or meter stick; 8.5" by 11" paper (1 per student); masking tape or painter's tape

Activity or EA	Activity or EA Standards Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
1 (Guided) Operations on Positive Rational Numbers- *Paper Clips, Airplanes, and Spiders*	Students are familiar with operations on whole numbers. In this first activity, they solve real-world problems with positive rational numbers using addition, subtraction, multiplication, and division. They also estimate answers using the four operations to check for reasonableness and justify solutions.	Lessons 1-1 to 1-4 (4 lessons)	**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. **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.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.
2 (Guided) Addition and Subtraction of Integers- *Elevation Ups and Downs*	Students have reviewed the operations with positive rational numbers. In Activity 2, students use a number line and absolute value to add integers. They then conjecture an algorithm and apply it to add and subtract integers.	Lessons 2-1 and 2-2 (2 Lessons)	**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. **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.* **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.

EA 1 Positive Rational Numbers and Adding and Subtracting Integers – *Off to the Races*	• Operations on decimals • Operations on fractions and mixed numbers • Converting rational numbers to decimals • Find the absolute value of an integer • Compare integers • Add integers • Subtract integers		**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. **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.* **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.
3 **(Investigative)** Multiplication and Division of Integers- *What's the Sign?*	Students are familiar with operations on whole numbers. In this activity, they solve mathematical and real-world problems with rational numbers using multiplication and division.	Lessons 3-1 and 3-2 (2 Lessons)	**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.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 $-\frac{p}{q} = \frac{(-p)}{q} = \frac{p}{(-q)}$. Interpret quotients of rational numbers by describing real-world contexts. **7.NS.A.3** Solve real-world and mathematical problems involving the four operations with rational numbers
4 **(Directed)** Operations on Rational Numbers- *Let's be Rational*	Students have reviewed the operations with positive rational numbers. In Activity 4, students first learn to classify subsets of the rational numbers. Then they extend their understanding of operations with integers to positive and negative rational numbers.	Lessons 4-1 to 4-4 (4 Lessons)	**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. **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. **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
EA 2 Rational Number Operations and Multiplying and Dividing Integers- *Top to Bottom*	• Multiply integers • Divide integers • Operations on rational numbers		**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. **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. **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.

Unit 2- Expressions and Equations

Prerequisite Skills:
- Equations (Item 2) 8.EE.C.7b
- Integers and expressions (Items 3, 4, 5, 6) 6.NS.C.7, 6.EE.A.1, 6.EE.2a, 6.EE.A.2c
- Applications (Items 1, 7, 8) 7.RP.A.2, 7.RP.A.2c, 7.RP.A.3, 7.EE.B.4, 7.G.B.6

Materials:
Two-color counters; graph paper

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
5 (Guided) Properties of Operations- *What's In a Name?*	In earlier grades, students learned the properties of numbers by looking at numerical examples and then generalizing that 2 + 5 = 5 + 2 was clearly true, and so was 4 + 7 = 7 + 4. After observing additional similar examples, it seemed reasonable to conclude that regardless of the order in which you added two numbers, the sum would be the same. Without algebra, however, students were not able to write a single equation that expressed this fact. In this activity, students widen their understanding of what it means to generalize in mathematics by expressing and applying the universal properties of numbers through the use of variables.	Lessons 5-1 and 5-2 (2 Lessons)	**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* + 0.05*a* = 1.05*a means that "increase by* 5%*" is the same as "multiply by* 1.05*."*
6 (Guided) Writing and Solving Equations- *Melody's Music Solution*	Students have written and evaluated expressions to solve real-world problems involving unchanging numerical data. In this activity they move from the concrete to the abstract by using variables to represent quantities that vary, writing equations to describe real-world or mathematical situations, and solving the equations.	Lessons 6-1 and 6-2 (2 Lessons)	**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* + 0.05*a* = 1.05*a means that "increase by* 5%*" is the same as "multiply by* 1.05*."* **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 ¾ *inches long in the center of a door that is* 27 ½ *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.*

EA 1 Writing and Solving Equations- *Fundraising Fun*	• Apply Properties of Operations • Model Two-Step Equations • Write Two-Step Equations • Solve Two-Step Equations		**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."* **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.
7 **(Guided)** Solving and Graphing Inequalities- *It Plays to Save*	Students continue their study of open number sentences and how to solve them; applying methods they used to solve equations to the solution of one- and two-step inequalities. Students discover that they need to be mindful when multiplying or dividing both sides of an inequality by a negative number, and that solutions of inequalities generally consist of a range of numbers rather than a single number.	Lessons 7-1 and 7-2 (2 Lessons)	**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 ¾ inches long in the center of a door that is 27 ½ 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.*
EA 2 Solving Inequalities- *A Gold Medal Appetite*	• Model Two-Step Inequalities • Write Two-Step Inequalities • Solve Two-Step Inequalities		**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 ¾ inches long in the center of a door that is 27 ½ inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.* **7.EE.B.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.

Unit 3- Ratio and Proportion

Prerequisite Skills:
- Ratios, Tables and Graphs (Item 1, 2, 3) 6.RP.A.3, 6.RP.A.3a
- Expressions and Equations (Items 4, 5) 8.EE.C.7
- Fractions, Decimals and Percents (Items 6, 7, 8) 7.NS.A.2, 5.NF.B.4

Materials:
None

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
8 (Investigative) Ratio and Unit Rates- *Strange, but True*	In previous courses, students have written ratios of two quantities. In Activity 8, students compute the ratio of two quantities with the same units and ratios that compare two different kinds of units, or rates. They also study rates with a denominator of 1, or unit rates.	Lessons 8-1 to 8-3 (3 Lessons)	**7.RP.A.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measures in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour. **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.
9 (Investigative) Proportional Reasoning- *Scrutinizing Coins*	In previous activities, students computed ratios, rates, and unit rates. In Activity 9, students build on these skills to solve problems in the real-world that involve proportional relationships. They find the constant of proportionality from a table, graph, equation, or verbal description of a proportional relationship.	Lessons 9-1 and 9-2 (2 Lessons)	**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.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.* **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.

EA 1 Ratios, Proportions, and Proportional Reasoning- *Weighing in on Diamonds*	• Solve problems involving proportional relationships • Convert between measurement systems using unit rates and using proportions • Represent constant rates of change with equations of the form $y = kx$ • Determine the constant of proportionality from a table, graph, or equation		**7.RP.A.1** Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measures in like or different units. For example, if a person walks $\frac{1}{2}$ mile in each $\frac{1}{4}$ hour, compute the unit rate as the complex fraction $\frac{1/2}{1/4}$ miles per hour, equivalently 2 miles per hour. **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.
10 (Investigative) Proportional Relationships and Scale- *Patriotic Proportions*	In previous activities, students have written equations for proportional relationships given by tables, graphs, and verbal descriptions. In Activity 10, students apply this knowledge to solving problems using scale drawings and finding the actual distance represented by the scale of a map. They also reproduce a scale drawing at a different scale.	Lessons 10-1 to 10-3 (3 Lessons)	**7.RP.A.2** Recognize and represent proportional relationships between quantities. **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 constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* **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.
EA 2 Proportional Relationships and Scale- *Patriotic Proportions*	• Solve problems using scale drawings • Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing • Reproduce a scale drawing at a different scale		**7.RP.A.2** Recognize and represent proportional relationships between quantities. **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 constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.* **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.

11 **(Directed)** Percent Problems- *Well, There Is More Than One Way*	Students wrote and solved proportions in previous activities. In Activity 11, students derive the percent equation, percent times whole = part, by first solving proportions. Then they use the percent equation to find the percent of a number, the percent that one number is of another, and the part when given the percent and the whole.	Lessons 11-1 and 11-2 (2 Lessons)	**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.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* $\frac{1}{10}$ *of her salary an hour, or* $2.50, *for a new salary of* $27.50. *If you want to place a towel bar* $9\frac{3}{4}$ *inches long in the center of a door that is* $27\frac{1}{2}$ *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.*
12 **(Directed)** More Percent Problems- *Like Animals? Have I Got a Job for You!*	In Activity 11, students computed percent using the percent equation. In Activity 12, students use the percent increase equation, % of change= $\frac{\text{difference}}{\text{orginal amount}}$ * 100, to solve percent problems about percent increase, percent decrease, markups, and discounts. They also find interest on a loan and percent error.	Lessons 12-1 to 12-4 (4 Lessons)	**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.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* $\frac{1}{10}$ *of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar* $9\frac{3}{4}$ *inches long in the center of a door that is* $27\frac{1}{2}$ *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.*
EA 3 Percents and Proportions- *Socializing and Selling*	• Find the percent of a number • Find the percent that one number is of another • Given the percent and the whole, find the part • Solve problems about sales tax, tips, and commissions • Solve problems about percent increase, percent decrease, markups, and discounts • Solve problems about interest and percent error		**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.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* $\frac{1}{10}$ *of her salary an hour, or* $2.50, *for a new salary of* $27.50. *If you want to place a towel bar* $9\frac{3}{4}$ *inches long in the center of a door that is* $27\frac{1}{2}$ *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.*

Unit 4- Geometry

Prerequisite Skills:
- Understand ratios (Item 1) 6.RP.A.3
- Solve equations (Item 2) 7.EE.B.3, 7.EE.B.4
- Classify geometric figures (Items 3, 6, 7, 8) 2.G.A.1, 3.G.A.1, 4.G.A.1, 4.G.A.2, 7.G.A.2
- Find area of figures (Items 4, 5) 6.G.A.1, 7.G.B.4

Materials:
Dot paper; grid paper; index cards; model prisms; model pyramids; metric ruler; protractor; scissors; straws; string; tape; unit cubes; prisms; metric measuring tape; coins; paper plates; cups; lids

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
13 (Guided) Angle Pairs- *Some of the Angles*	In previous grades, students learned that an angle is a figure formed by two rays meeting at a common endpoint. They classify angles by their measure and distinguish them from related geometric figures such as triangles and polygons. In Activity 13, students begin to distinguish among various types of angles and classify them by their relationships with other angles.	Lesson 13-1 and 13-2 (2 Lessons)	**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.
14 (Guided) Triangle Measurements- *Rigid Bridges*	Until now, students' study of geometric shapes has largely been confined to lower-order knowledge levels— identifying and classifying triangles and angles, measuring, solving equations and routine multi-step problems. In Activity 14 they move beyond the routine to assess whether certain triangles are possible, and to explain why some are not.	Lessons 14-1 and 14-2 (2 Lessons)	**7.G.A.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.
EA 1 Angles and Triangles- *Pool Angles*	• Adjacent, vertical, complementary, and supplementary angles • Angles of a triangle		**7.G.A.2** Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. **7.G.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.

15 **(Guided)** Similar Figures- *The Same but Different*	Students have learned that a ratio is a comparison of two numbers and that a proportion is an equation equating two ratios. Ratios are useful in finding rates and unit rates and, especially, when they can be used to write a proportion which can be used to find a missing variable. In this activity, students apply ratios and proportions to learn whether figures are similar and, if they are, to calculate the measures of missing angles and sides.	Lessons 15-1 and 15-2 (2 Lessons)	**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.
16 **(Investigative)** Circles: Circumference and Area – *Gardens Galore*	In earlier grades, students learned basic facts about plane figures–how to classify them, distinguish them from one another, and, in certain cases, find their perimeters and areas. In this unit they examined more challenging topics: What conditions determine a unique triangle? How can you find a missing side of a triangle if it is similar to a triangle whose sides you know? In this activity, students learn how to find the circumference and area of a circle, the first figure with curved sides they have dealt with. This leads to the introduction of the number Pi whose digits, students are informed, "never end or repeat."	Lessons 16-1 and 16-2 (2 Lessons)	**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.
17 **(Investigative)** Composite Area- *Tile Designs*	Until now, students' study of geometric shapes has largely been confined to identifying polygons by the number of sides or the measure of their angles, and then finding the areas of the polygons. In Activity 17 they move on to finding the area and perimeter (and circumference) of two-dimensional shapes that are composites of polygons.	Lessons 17-1 and 17-2 (2 Lessons)	**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. **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.

EA 2 Circumference and Area- *In the Paint*	• Area of rectangles and circles • Area of composite plane shapes		**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. **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. **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.
18 **(Investigative)** Sketching Solids- *Putt-Putt Perspective*	Until now, students have applied area formulas to known geometric shapes in two dimensions. In Activity 18 they move on to finding the surface area of three-dimensional shapes. They learn the terminology associated with solids, how to find the cross section of solids, and how to find the lateral area and surface area of right prisms and pyramids.	Lessons 18-1 to 18-3 (3 Lessons)	**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. **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.
19 **(Investigative)** Volume- Prisms and Pyramids – *Berneen Wick's Candles*	Until now, students have applied volume formulas to simple solids. In Activity 19 they move on to finding the volume of prisms, pyramids, and the complex solids formed when two or more solids are put together.	Lesson 19-1 and 19-2 (2 Lessons)	**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.
EA 3 Surface Area and Volume- *Under the Sea*	• Nets for a prism • Surface area of a prism • Cross section of a solid		**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. **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.

Unit 5- Probability

Prerequisite Skills
- Fractions, decimals and percents (Items 2, 3) 7.NS.A.2b, 7.NS.A.3
- Equivalent Fractions (Item 1) 3.NF.A.3b
- Representation of fractions (Item 4) 2.G.A.3

Materials:
Paper clips; poster-size chart paper; pennies or colored chips

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
20 (Investigative) Exploring Probability – *Spinner Games*	Until now, students' study of probability has largely been focused on data provided to students. In Activity 20, students begin to develop a sense of experimental probability and the notion of a chance experiment, which is introduced more formally later.	Lessons 20-1 to 20-4 (4 Lessons)	**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. **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.*
21 (Investigative) Probability- *Probability Two Ways*	Students begin to calculate and compare experimental and theoretical probabilities. They will continue to observe frequencies in data generated randomly, and relate those observations to the expected outcomes.	Lessons 21-1 to 21-3 (3 Lessons)	**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 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?*
EA 1 Finding Probabilities – *Spinning Spinners and Random Picks*	• Anticipate outcomes based on a probability model • Reason about plausible probability models given observed outcomes. • Calculate theoretical probabilities for a probability experiment that has equally likely outcomes (a uniform probability model) • Estimate probabilities		**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. **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.* **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.

22 (Investigative) Games and Probability – *Rock, Paper, Scissors…. and Other Games*	Now that students are more familiar with experimental and theoretical probability, they can begin to use tables and tree diagrams to represent possible outcomes. They will extend their knowledge and compute probabilities for different outcomes in a sample space.	Lessons 22-1 to 22-4 (4 Lessons)	**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 event.
23 (Guided) Probability- *Estimating Probabilities Using Simulation*	Once students are comfortable with simple and compound events and how to use simulations for outcomes, they can design and carry out their own simulations. They will also use these simulations to estimate the probability of simple and compound events.	Lessons 23-1 to 23-4 (4 Lessons)	**7.SP.C.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. **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?*
EA 2 Probability and Simulation- *Flipping Coins and Random Choices*	• Use tables and tree diagrams to represent outcomes • Use a tree diagram to assign probabilities to outcomes in the sample space • Reason about equally likely outcomes • Plan a simulation for a given probability experiment • Use simulation to estimate Probabilities		**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 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?*

Unit 6- Statistics

Prerequisite Skills:
- Measures of Center (Item 1) 6.SP.B.5c
- Quartiles (Items 2, 3) 6.SP.B.5c
- Box plots and dot plots (Items 4, 5) 6.SP.B.4
- Mean Absolute Deviation (Item 6) 6.SP.B.5c

Materials:
Calculator; paper clips; pencils; poster-size chart paper; small paper bags; red and white plastic beads

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
24 (Investigative) Statistics- *Summer Reading Club*	Students collected and summarized data in previous grades where the population of interest was usually just their class, and data were collected for the entire class—a census. In this activity, students continue their study of statistics by analyzing data and exploring the difference between a whole population and a sample. Students will investigate sampling, and develop an understanding of the "fairness" of random sampling.	Lessons 24-1 and 24-2 (2 Lessons)	**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.
25 (Guided) Exploring Sampling Variability – *Sample Speak*	In this activity, students continue their study of statistics by using data from a random sample to make inferences and draw conclusions about a population of interest. Moreover, students explore sampling variability and its implications.	Lessons 25-1 and 25-2 (2 Lessons)	**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.*

EA 1 Random Sampling and Sampling Variability – *School Populations*	• Determine methods for selecting a random sample • Identify sampling variability • Use data from a sample to draw a conclusion about a population		**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. **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.*
26 (Investigative) Comparative Statistics- *Seventh- Grade Students*	In this activity, students continue their exploration of sampling variability to understand its role when comparing populations. Students will examine population means and compare sample means of random samples, expressing the difference in terms of the mean average deviation (MAD).	Lessons 26-1 to 26-3 (3 Lessons)	**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 basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.* **7.SP.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.*
EA 2	• Understand sampling variability • Use data from random samples to compare populations		**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 basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.* **7.SP.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.*

Unit 7- Personal Financial Literacy

Prerequisite Skills:
- Equivalent fractions (Items 1, 2) 3.NF.A.3, 3.NF.A.3a, 3.NF.A.3b
- Fractions, decimals, percents (Items 3, 7) 5.NBT.A.3, 7.NS.A.2
- Operations with decimals (Items 4, 5,6) 7.NS.A.2c

Activity or EA	Activity or EA Focus	Lessons within each Activity	Activity or EA Common Core Standards Benchmarks
27 (Directed) Budgeting and Money Management- *How Much is Too Much?*	Students apply their math knowledge to real-world scenarios to help them understand money management and develop effective practices related to using credit and saving for long-term goals such as a college education.	Lessons 27-1 and 27-2 (2 Lessons)	Aligns with the College and Career Readiness objective of the Common Core State Standards Initiative.

Name: _____ Class: _____ Date: _____ ID: A

SpringBoard Math Course 2 Unit 1 Part A

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ 1. Which set of numbers does not include –2?

a. rational numbers
b. integers
c. whole numbers
d. the opposites of the whole numbers

____ 2. Which situation describes how opposite quantities can be combined to make zero?

a. Earning points on a test.
b. Finding the distance between two cities.
c. Scoring points in a basketball game.
d. Balancing a budget

____ 3. A scuba diver dives beneath the ocean to a depth 30 feet below sea level or –30 ft. He then swims in the opposite direction back up to the surface of the water. Which number sentence describes this situation?

a. $-30-30=-60$
b. $30+30=0$
c. $-30+30=0$
d. $(-30)\left(\frac{1}{30}\right)=1$

____ 4. If Jacky adds –4 to 9, what is the resulting number?

a. –13
b. –5
c. 5
d. 13

____ 5. Simplify $2(-8+3)$.

a. –22
b. –13
c. –10
d. 22

____ 6. Lauren heard on the radio that the temperature was 4° when she went to bed. When she awoke the next morning, the temperature had dropped by 6°. Which number sentence shows how to find the temperature when Lauren awoke?

a. $4+(-6)=-2$
b. $4+6=10$
c. $-4+(-6)=-10$
d. $4+(-6)=2$

____ 7. Which fraction, when multiplied by 5, would result in a number greater than 5?

a. $\frac{1}{2}$
b. $\frac{4}{3}$
c. $\frac{7}{8}$
d. $\frac{1}{20}$

____ 8. Let p and q represent two different nonzero numbers. Which of the following describes how to determine $p - q$?

a. Add q to p.
b. Add the additive inverse of p to q.
c. Add the additive inverses of p and q.
d. Add the additive inverse of q to p.

____ 9. If Sharon has $\frac{3}{5}$ of a dollar and finds 0.88 cents, which number represents how much she has?

a. \$0.28
b. $\$\frac{2.64}{5}$
c. \$0.91
d. \$1.48

____ 10. If Randal ate $\frac{3}{8}$ of a pizza and Gratten ate 0.5 of the pizza, which of the following represents the part of the pizza that was not eaten?

a. 0
b. $\frac{1}{8}$
c. $\frac{3}{8}$
d. $\frac{7}{8}$

____ 11. Tamara wants to buy a jacket for \$15.99 and a blouse for \$7.49. The prices include tax. If she gives the cashier two \$20 bills, how much change should Tamara expect?

a. \$6.52
b. \$17.52
c. \$16.52
d. \$23.48

____ 12. What is the value of the expression $\frac{7}{9} - \frac{5}{6} - \left(-\frac{1}{3}\right)$?

a. $-\frac{7}{18}$
b. $-\frac{5}{18}$
c. $\frac{5}{18}$
d. $\frac{7}{18}$

____ 13. Brittany wants to find a numerical expression equivalent to $\frac{-6}{7}$. Which of the following should she choose?

a. $\left(\frac{-6}{3.5}\right)2$
b. $\left(\frac{-2}{7}\right)3$
c. $\left(\frac{-6}{7}\right)(-1)$
d. $\frac{7}{-6}$

____ 14. Linsay owes her cousin $9. This debt is represented by the integer –9. If Linsay repays one third of this debt, which rational number represents her new debt to her cousin?

a. –3
b. –4.5
c. –6
d. –9

____ 15. Which of the following is not equal to $-\frac{5}{6}$?

a. $\frac{5}{6}$
b. $\frac{5}{-6}$
c. $\frac{-5}{6}$
d. $-\left(\frac{-5}{-6}\right)$

____ 16. A water tank will be drained at a constant rate of 42.4 liters per hour starting at 9:00 A.M. After one hour, the change in the amount of water in the tank can be represented as –42.4. Which of the following represents the total change in the amount of water in the tank by 9:00 A.M. the next day?

a. –1017.6
b. –508.8
c. –42.4
d. –18.5

____ 17. What is $-3\frac{1}{5}$ divided by –9.6?

a. –3
b. $-\frac{1}{3}$
c. $\frac{1}{3}$
d. 3

____ 18. In May, Kelly made a profit of $100.50 selling lemonade at her lemonade stand. In June, Kelly made a profit twice as large as her profit from May. In July, Kelly's profit was $\frac{7}{10}$ of the profit in May because she had to buy a new lemonade stand. What was her profit in July?

a. $30.15
b. $70.35
c. $130.65
d. $201.00

____ 19. Which of the following rational numbers is equivalent to a repeating decimal?

a. $\frac{-3}{8}$
b. $\frac{7}{14}$
c. $\frac{7}{9}$
d. $\frac{7}{7}$

____ 20. Kelsey represented her seventh grade class in a history contest, in which students win 2.5 points by answering a history question correctly or lose 2.5 points by answering a question incorrectly. At the end of the contest, her score was –5 points. Which of the following gives the numbers of her correct and incorrect answers?

a. 8 correct and 2 incorrect
b. 6 correct and 4 incorrect
c. 4 correct and 6 incorrect
d. 5 correct and 5 incorrect

____ 21. Which of the following expressions has two times the value of $-\frac{7}{8} \div \left(-\frac{1}{4}\right)$?

a. $4.55 \div 1.3$
b. -08.75×-0.2
c. $-\frac{21}{60} \times 20$
d. $8 \times \frac{7}{8}$

____ 22. A stock went on the market for $126.80 per share. Over the next 10 days, a share of the stock dropped a total of $6.40 for a change of –6.40. Which of the following represents the average change in the price of the stock per day?

a. –120.40
b. –64.00
c. –12.68
d. –0.64

Name: _____ Class: _____ Date: _____ ID: A

SpringBoard Math Course 2 Unit 1 Part B

Short Answer

1. Is every integer also a rational number? Explain why or why not and give examples.

2. Jim ran 5 miles last week. Today, he ran $\frac{1}{4}$ the distance he ran last week. Tomorrow he plans to run 3.5 miles. How far will Jim have run after running tomorrow? Show your work.

Essay

3. Eric is 70 inches tall. His little brother Paolo is half as tall as Eric. Annette is 5.25 inches taller than Paolo. How tall is Annette? How can you solve this problem using fractions? Show your work.

SpringBoard Math Course 2 Unit 1 Part A
Answer Section

MULTIPLE CHOICE

1. ANS: C

	Feedback
A	Incorrect. –2 can be expressed as the ratio of two integers, such as $\frac{-2}{1}$ or $\frac{2}{-1}$, so the rational numbers include –2.
B	Incorrect. The set of integers consists of the natural numbers (1, 2, 3, ...), their opposites, and zero. –2 is the opposite of the natural number 2, so the integers include –2.
C	Correct. The whole numbers consist of the natural numbers and zero. The natural numbers are all positive, so the whole numbers do not include –2.
D	Incorrect. The opposites of the whole numbers are 0, –1, –2, –3,...; so –2 is included in this set.

PTS: 1

2. ANS: D

	Feedback
A	Incorrect. On a test, the goal is to combine points to get a score that is greater than zero.
B	Incorrect. The distance between two cities must be a number greater than zero.
C	Incorrect. Scoring points in a basketball game results in a number greater than zero.
D	Correct. Balancing a budget involves combining the amount of money coming in with the amount of money going out so that the result is zero.

PTS: 1 NAT: 1EC910FE-7053-11DF-8EBF-BE719DFF4B22

3. ANS: C

	Feedback
A	Incorrect. This sentence indicates that the diver winds up 60 feet below the surface of the water, not at the surface.
B	Incorrect. The left side of this equation does not indicate that the diver dove 30 feet below the surface before swimming 30 back up to the surface. Notice that the indicated sum on the left of the equal sign is not equal to zero.
C	Correct. –30 feet is 30 feet below sea level. The opposite direction of –30 is +30, and $-30 + 30 = 0$.
D	Incorrect. You need to add the integers indicating the directions in which the diver dove. Remember that the diver winds up at the surface of the water, which is indicated by an elevation of 0.

PTS: 1 NAT: 1EC910FE-7053-11DF-8EBF-BE719DFF4B22

4. ANS: C

	Feedback
A	Incorrect. The numbers Jacky is adding have opposite signs. Use the rule for adding numbers with opposite signs to find the correct sum..
B	Incorrect. It appears that you followed the rule for adding numbers with opposite signs but made a mistake with the sign of the sum. Visualize the sum of –4 and 9 on a number line.
C	Correct. To add two numbers with different signs, find the difference of their absolute values and then use the sign of the addend with the greater absolute value for the sum.
D	Incorrect. This is the sum of 4 and 9, not the sum of –4 and 9.

PTS: 1 NAT: 1ECBB426-7053-11DF-8EBF-BE719DFF4B22

5. ANS: C

	Feedback
A	Incorrect. It appears that you made an error when adding –8 and 3. You need to apply the rule for adding numbers with opposite signs.
B	Incorrect. If you used the distributive property to simplify and multiplied –8 by 2, you must also multiply 3 by 2.
C	Correct. $2(-8+3)=2(-5)=-10$.
D	Incorrect. It appears that you made an error when adding –8 and 3. You need to apply the rule for adding numbers with opposite signs.

PTS: 1 NAT: 1ECBB426-7053-11DF-8EBF-BE719DFF4B22

6. ANS: A

	Feedback
A	Correct. The temperature started at 4° above 0, or positive 4. To find a 6° drop, add –6 to 4 and follow the rule for adding two numbers with different signs: $4 + (-6) = -2$.
B	Incorrect. This number sentence shows how to find a 6° rise in temperature.
C	Incorrect. This sentence shows how to find the temperature when Lauren awoke if the temperature when she went to bed was 4° below zero.
D	Incorrect. The left side of the number sentence is correct, but you made a mistake in adding. You need to follow the rule for adding two numbers with different signs.

PTS: 1 NAT: 1ECBB426-7053-11DF-8EBF-BE719DFF4B22

7. ANS: B

	Feedback
A	Incorrect. Multiplying a number by $\frac{1}{2}$ is the same as finding $\frac{1}{2}$ of the number. One half of 5 is not greater than 5.
B	Correct. Multiplying a given number by a number greater than 1 results in a number that is greater than the given number.
C	Incorrect. 7 and 8 are each greater than 5; however, the fraction $\frac{7}{8}$ is less than 1. In order to get a result greater than 5, you need to multiply 5 by a number greater than 1.
D	Incorrect. If you multiply 5 by a number less than 1, such as $\frac{1}{20}$, the result will be less than 5, not greater than 5. Look for an answer choice that is greater than 1.

PTS: 1 NAT: 1ECD20F4-7053-11DF-8EBF-BE719DFF4B22

8. ANS: D

	Feedback
A	Incorrect. $p - q$ indicates subtraction, so you would not add p and q to find the difference.
B	Incorrect. The additive inverse of p is $-p$; but $-p + q$ is not the same as $p - q$. Look for the answer that indicates how to write a subtraction problem as an addition problem.
C	Incorrect. The additive inverse of p is $-p$ and the additive inverse of q is $-q$; but $-p + (-q)$ not the same as $p - q$.
D	Correct. The additive inverse of q is $-q$. By the definition of subtraction, $p - q = p + (-q)$, where $-q$ represents the additive inverse of q.

PTS: 1 NAT: 1ECD20F4-7053-11DF-8EBF-BE719DFF4B22

9. ANS: D

	Feedback
A	Incorrect. It appears that you subtracted the amounts instead of adding them.
B	Incorrect. It appears that you multiplied the amounts. You need to add them to find how much money Sharon has.
C	Incorrect. Convert $\frac{3}{5}$ to a decimal to represent a number of cents. Then add the result to 0.88.
D	Correct. $\frac{3}{5} = 0.6$, and $0.6 + 0.88 = 1.48$.

PTS: 1 NAT: 1ECE159A-7053-11DF-8EBF-BE719DFF4B22

10. ANS: B

	Feedback
A	Incorrect. You may have mistakenly thought that $0.5 = \frac{5}{8}$ and added $\frac{3}{8} + \frac{5}{8} = \frac{8}{8} = 1$. Correctly convert 0.5 to a fraction with 8 in the denominator, add the fraction to $\frac{3}{8}$, and then subtract the sum from 1, the whole pizza, to find the part that was not eaten.
B	Correct. $\frac{3}{8} + 0.5 = \frac{3}{8} + \frac{4}{8} = \frac{7}{8}$, and $1 - \frac{7}{8} = \frac{1}{8}$
C	Incorrect. This is the part that Randal ate. Add this to the part that Gratten ate and subtract the sum from 1 to find the part of the pizza that was not eaten.
D	Incorrect. This is the part that was eaten. The question asks for the part that was not eaten.

PTS: 1 NAT: 1ECE159A-7053-11DF-8EBF-BE719DFF4B22

11. ANS: C

	Feedback
A	Incorrect. This is the amount of change Tamara would receive if she gave the cashier $30. Tamara gave the cashier two $20 bills.
B	Incorrect. You may have made a mistake in subtraction. Add the two prices and subtract the sum from the amount of money represented by two $20 bills.
C	Correct. $15.99 + $7.49 = $23.48, and $40 – $23.48 = $16.52.
D	Incorrect. This is the sum of the prices of the two items. You need to find the change Tamara will receive from two $20 bills.

PTS: 1 NAT: 1ECE159A-7053-11DF-8EBF-BE719DFF4B22

12. ANS: C

	Feedback
A	Incorrect. It appears that you forgot that subtracting $-\frac{1}{3}$ is the same as adding $\frac{1}{3}$.
B	Incorrect. It appears that you have found a correct common denominator for the three fractions but have made an error in adding the numerators.
C	Correct. $\frac{7}{9} - \frac{5}{6} - \left(-\frac{1}{3}\right) = \frac{14}{18} - \frac{15}{18} - \left(-\frac{6}{18}\right) = \frac{14}{18} - \frac{15}{18} + \frac{6}{18} = \frac{5}{18}$
D	Incorrect. It appears that you made an error in finding the difference $\frac{7}{9} - \frac{5}{6}$, or $\frac{14}{18} - \frac{15}{18}$.

PTS: 1 NAT: 1ECE159A-7053-11DF-8EBF-BE719DFF4B22

13. ANS: B

	Feedback
A	Incorrect. $\left(\frac{-6}{3.5}\right)2 = \frac{-12}{3.5} = \frac{-24}{7}$, which is not equivalent to $\frac{-6}{7}$.
B	Correct. $\left(\frac{-2}{7}\right)3 = \left(\frac{-2}{7}\right)\left(\frac{3}{1}\right) = \frac{-6}{7}$
C	Incorrect. $\left(\frac{-6}{7}\right)(-1) = \frac{6}{7}$, which is not equivalent to $\frac{-6}{7}$.
D	Incorrect. This is the negative reciprocal of $\frac{-6}{7}$. Only –1 and 1 are equivalent to their reciprocals.

PTS: 1 NAT: 1ED0C7D6-7053-11DF-8EBF-BE719DFF4B22

14. ANS: C

	Feedback
A	Incorrect. This number represents one third of the debt. You must subtract this from –9 to determine Linsay's new debt..
B	Incorrect. This would be the answer if Linsay repays half of the debt. You need to find the number that represents Linsay's new debt after she has paid one third of the debt.
C	Correct. One third of the debt is $\frac{1}{3} \times (-9)$, or –3. Subtract this from the debt to get –9 – (–3), or –6, the integer representing Linsay's new debt.
D	Incorrect. This represents the amount Linsay originally owes. Find one third of this and subtract the result from –9 to find the number that represents her new debt.

PTS: 1 NAT: 1ED0C7D6-7053-11DF-8EBF-BE719DFF4B22

15. ANS: A

	Feedback
A	Correct. This is the opposite of $-\frac{5}{6}$.
B	Incorrect. For any two nonzero integers p and q, $-\frac{p}{q} = \frac{-p}{q} = \frac{p}{-q}$, so $-\frac{5}{6} = \frac{5}{-6}$.
C	Incorrect. For any two nonzero integers p and q, $-\frac{p}{q} = \frac{-p}{q} = \frac{p}{-q}$, so $-\frac{5}{6} = \frac{5}{-6}$.
D	Incorrect. $\frac{-5}{-6} = \frac{5}{6}$ Then $-\left(\frac{5}{6}\right) = \frac{-5}{6}$.

PTS: 1 NAT: 1ED1FDF4-7053-11DF-8EBF-BE719DFF4B22

16. ANS: A

	Feedback
A	Correct. After 24 hours, the total change in the amount of water in the tank is $24 \times -42.4 = -1017.6$ liters.
B	Incorrect. It appears that you found the total change after 12 hours. From 9:00 A.M. to 9:00 A.M. the next day is a period of 24 hours.
C	Incorrect. This is the change in the amount of water in just one hour. You need to find the change in the amount of water in the 24-hour period from 9:00 A.M. in the morning to 9:00 A.M. in the morning of the next day.
D	Incorrect. It appears that you added –42.4 and 24. You need to multiply these numbers to find the answer.

PTS: 1 NAT: 1ED3352A-7053-11DF-8EBF-BE719DFF4B22

17. ANS: C

	Feedback
A	Incorrect. When a negative number is divided by a negative number, the result is positive. Convert both numbers to decimals or both numbers to mixed numbers and try the division again.
B	Incorrect. When a negative number is divided by a negative number, the result is positive. Convert both numbers to decimals or both numbers to mixed numbers and try the division again.
C	Correct. You can find the quotient by using mixed numbers: $-3\frac{1}{5} \div (-9.6) = -3\frac{1}{5} \div \left(-9\frac{3}{5}\right) = -\frac{16}{5} \div \left(-\frac{48}{5}\right) = -\frac{16}{5} \times \left(-\frac{5}{48}\right) = \frac{1}{3}$. You could also find the quotient using decimals: $-3.2 \div (-9.6) = 0.\bar{3} = \frac{1}{3}$.
D	Incorrect. It appears that you switched the order of the numbers in the division. Find $-3\frac{1}{5} \div (-9.6)$.

PTS: 1 NAT: 1ED3352A-7053-11DF-8EBF-BE719DFF4B22

18. ANS: B

	Feedback
A	Incorrect. This is the amount her profit decreases in July compared with the May profit, but it is not the total profit for July.
B	Correct. Profit in July = $\frac{7}{10}$(Profit in May) = $\frac{7}{10}$(\$100.50) = (0.7)(\$100.50) = \$70.35.
C	Incorrect. Her profit in May was \$100.50. Since her profit in July was $\frac{7}{10}$ of her May profit, her profit in July has to be less than \$100.50.
D	Incorrect. This is the profit she made in June. This information is not needed to solve the problem. Find $\frac{7}{10}$ of her profit in May to find her profit in July.

PTS: 1 NAT: 1ED3352A-7053-11DF-8EBF-BE719DFF4B22

19. ANS: C

	Feedback
A	Incorrect. $\frac{-3}{8} = -0375$, which is a terminating decimal.
B	Incorrect. $\frac{7}{14} = 0.5$, which is a terminating decimal.
C	Correct. $\frac{7}{9} = 0.\overline{7}$, which a repeating decimal.
D	Incorrect. $\frac{7}{7} = 1.0$, which is a terminating decimal.

PTS: 1 NAT: 1ED49A78-7053-11DF-8EBF-BE719DFF4B22

20. ANS: C

	Feedback
A	Incorrect. 8 correct answers gives $8 \times 2.5 = 20$ points, and 2 incorrect answers gives $2 \times (-2.5) = -5$ points. $20 + (-5) = 15$ points, not -5 points.
B	Incorrect. 6 correct answers gives $6 \times 2.5 = 15$ points, and 4 incorrect answers gives $4 \times (-2.5) = -10$ points. $15 + (-10) = 5$ points, not -5 points
C	Correct. 4 correct answers gives $4 \times 2.5 = 10$ points, and 6 incorrect answers gives $6 \times (-2.5) = -15$ points. $10 + (-15) = -5$ points.
D	Incorrect. If she answered the same number of questions correctly and incorrectly, her final score would be 0 points, not -5 points.

PTS: 1 NAT: 1ED58500-7053-11DF-8EBF-BE719DFF4B22

21. ANS: D

	Feedback
A	Incorrect. This expression has the same value as $-\left(-\frac{7}{8} \div \left(-\frac{1}{4}\right)\right)$. You want an expression whose value is two times $-\frac{7}{8} \div \left(-\frac{1}{4}\right)$.
B	Incorrect. This expression has a value that is half the value of $-\frac{7}{8} \div \left(-\frac{1}{4}\right)$. You want an expression whose value is two times $-\frac{7}{8} \div \left(-\frac{1}{4}\right)$.
C	Incorrect. The value of this expression is a negative number. Twice the value of $-\frac{7}{8} \div \left(-\frac{1}{4}\right)$ is a positive number.
D	Correct. $8 \times \frac{7}{8} = 7$ and $2 \times \left(-\frac{7}{8} \div \left(-\frac{1}{4}\right)\right) = 2 \times \left(\frac{7}{2}\right) = 7$.

PTS: 1 NAT: 1ED58500-7053-11DF-8EBF-BE719DFF4B22

22. ANS: D

	Feedback
A	Incorrect. It appears that you subtracted the original price of the stock from 6.40. You need to divide the total change for 10 days by 10 to find the average change per day.
B	Incorrect. It appears that you multiplied the total change by 10. You need to divide the total change by 10 to find the answer.
C	Incorrect. It appears that you tried to find the answer by dividing the initial price of a share by 10. You need to divide the total change by 10.
D	Correct. You divide the total change for 10 days by 10 to find the average change per day: $-6.40 \div 10 = -0.64$.

PTS: 1 NAT: 1ED58500-7053-11DF-8EBF-BE719DFF4B22

SpringBoard Math Course 2 Unit 1 Part B
Answer Section

SHORT ANSWER

1. ANS:
   Yes. A rational number can be expressed as the ratio of two integers, and any integer can be expressed as the ratio of two integers. Examples: $-3 = \frac{-3}{1}$ or $\frac{3}{-1}$; $0 = \frac{0}{4}$; $5 = \frac{5}{1}$.

   PTS: 1
2. ANS:
   $5 + 5\left(\frac{1}{4}\right) + 3.5 = 9.75$ miles

   PTS: 1 NAT: 1ECE159A-7053-11DF-8EBF-BE719DFF4B22

ESSAY

3. ANS:
   Annette's Height = (Eric's Height ÷ 2) + the difference between Paolo and Annette's Height.

   Annette's Height = (70 ÷ 2) + 5.25 = 40.25 inches

   Solving the problem using fractions: $\left(\frac{70}{1} \div \frac{2}{1}\right) + 5\frac{1}{4} = \left(\frac{70}{1}\right)\left(\frac{1}{2}\right) + 5\frac{1}{4} = 35 + 5\frac{1}{4} = 40\frac{1}{4}$ inches

   PTS: 1 NAT: 1ED58500-7053-11DF-8EBF-BE719DFF4B22