

## Curriculum Map: Math 7- 2019

Course: MATH 7 Sub-topic: General

Grade(s): 7

**Course** *Students at the level will exhibit the following:*

**Description:**

**Construct viable arguments and critique the reasoning of others**

- Construct arguments using verbal or written explanations accompanied by expressions, equations, inequalities, models, and graphs, tables, and other data displays (i.e. box plots, dot plots, histograms, etc.)
- Refine their mathematical communication skills through mathematical communication skills through mathematical discussions in which they critically evaluate their own thinking and the thinking of other students
- Pose questions like "How did you get that?", "Why is that true?", "Does that always work?"
- Explain their thinking to others and respond to others' thinking

**Model with mathematics**

- Model problem situations symbolically, graphically, tabularly, and contextually
- Form expressions, equations, or inequalities from real world contexts and connect symbolic and graphical representations
- Explore covariance and represent two quantities simultaneously
- Use measures of center and variability and data displays (i.e. box plots and histograms) to draw inferences, make comparisons and formulate predictions
- Use experiments or simulations to generate data sets and create probability models
- Connect and explain the connections between the different representations
- Use all representations as appropriate to a problem context

**Use appropriate tools strategically**

- Consider available tools (including estimations and technology) when solving a mathematical problem and decide when certain tools might be helpful
- Decide to represent similar data sets using dot plots with the same scale to visually compare the center and variability of the data
- Use physical objects or applets to generate probability data
- Use graphing calculators or spreadsheets to manage and represent data in different forms

**Attend to precision**

- Continue to refine their mathematical communication skills by using clear and precise language in their discussions with others and in their own reasoning
- Define variables, specify units of measure, and label axes accurately
- Use appropriate terminology when referring to rates, ratios, probability models, geometric figures, data displays, and components of expressions, equations or inequalities

**Look for and make use of structure**

- Routinely seek patterns or structures to model and solve problems
- Recognize patterns that exist in ratio tables making connections between the constant of proportionality in a table with the slope of a graph
- Apply properties to generate equivalent expressions (i.e.  $6+2x=3(2+x)$  by distributive property)
- Solve equations (i.e.  $2c+3=12$ ,  $2c=12$  by subtraction property of equality,  $c=6$  by division property of equality)
- Compose and decompose two- and three- dimensional figures to solve real world problems involving scale drawings, surface area, and volume
- Examine tree diagrams or systemic lists to determine the sample space for compound events and verify that they have listed all possibilities

**Look for and express regularity in repeated reasoning**

- Use repeated reasoning to understand algorithms and make generalizations about patterns

- Solve and model problems. They may notice that  $a/b \div c/d = ad/bc$  and construct other examples and models that confirm their generalization
- Extend their thinking to include complex fractions and rational numbers
- Formally begin to make connections between covariance, rates and representations showing the relationships between quantities
- Create, explain, evaluate, and modify probability models to describe simple and compound events

## Unit: Rational Numbers

**Month:** August/September/October

**Skills:** 1. Solve real-world and mathematical problems involving four operations with rational numbers

**Essential Questions:**

1. How can mathematics support effective communication?
2. How are relationships represented mathematically?
3. How can expressions, equations and inequalities be used to quantify, solve, model and/or analyze mathematical situations?
4. What does it mean to estimate or analyze numerical quantities?
5. What makes a tool and/or strategy appropriate for a given task?
6. How can recognizing repetition or regularity assist in solving problems more efficiently?

**Content:**

1. Mathematical relationships among numbers can be represented, compared and communicated.
2. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.
3. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.
4. Patterns exhibit relationships that can be extended, described, and generalized.

**Assessments:** quizzes, unit 1 test

**Vocabulary:** Rational numbers

**Resources:** GoMath workbook

### STANDARDS: STANDARDS

STATE: PA Core Standards (2014)

[CC.2.1.7.E.1 \(Advanced\)](#) Apply and extend previous understandings of operations with fractions to operations with rational numbers.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.A-N.1.1.1 \(Advanced\)](#) Apply properties of operations to add and subtract rational numbers, including real-world contexts.

Alternate Eligible Content Code M07AN1.1.1a: Solve a 1-step addition or subtraction problem with fractions, decimals, or positive/negative integers

[M07.A-N.1.1.2](#)  
(Advanced)

Represent addition and subtraction on a horizontal or vertical number line.

Alternate Eligible Content Code M07AN1.1.2a: Identify the difference between two numbers on the number line

[M07.A-N.1.1.3](#)  
(Advanced)

Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeats.

Alternate Eligible Content Code M07AN1.1.3a: Solve a multiplication or division problem with positive/negative rational numbers

(\* standards consolidated from Topic level)

### Topic: Lesson 1-5: Adding & Subtracting Integers (E)

Minutes for Topic: 210

#### Core Lesson

**Student Learning** SWBAT add and subtract integers on a number-line and apply them to real world context.

#### Objectives:

**Core Lesson** How do you add and subtract integers? (E)

#### Essential

**Questions:** How can you use addition and subtraction of integers to solve real-world problems? (E)

### STANDARDS

STATE: PA Core Standards (2014)

[CC.2.1.7.E.1](#) (Advanced)

Apply and extend previous understandings of operations with fractions to operations with rational numbers.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.A-N.1.1.1](#) (Advanced)

Apply properties of operations to add and subtract rational numbers, including real-world contexts.

Alternate Eligible Content Code M07AN1.1.1a: Solve a 1-step addition or subtraction problem with fractions, decimals, or positive/negative integers

[M07.A-N.1.1.2](#) (Advanced)

Represent addition and subtraction on a horizontal or vertical number line.

Alternate Eligible Content Code M07AN1.1.2a: Identify the difference between two numbers on the number line

[M07.A-N.1.1.3](#) (Advanced)

Apply properties of operations to multiply and divide rational numbers, including real-world contexts; demonstrate that the decimal form of a rational number terminates or eventually repeats.

Alternate Eligible Content Code M07AN1.1.3a: Solve a multiplication or division problem with positive/negative rational numbers

### Topic: Lesson 6-7: Multiplying & Dividing Integers (E)

Minutes for Topic: 84

#### Core Lesson

**Student Learning** SWBAT multiply & divide integers including real world context.

#### Objectives:

**Core Lesson** How do you multiply and divide integers? (E)

#### Essential

**Questions:** How can you use multiplication and division of integers to solve real-world problems? (E)

**Topic: Lesson 8: Ration Numbers to Decimals (E, I)**

Minutes for Topic: 42

**Core Lesson** SWBAT determine how rational numbers are used to solve real-world problems.  
**Student Learning Objectives:** SWBAT convert between different types of rational numbers.

**Core Lesson Essential Questions:** How can you use rational numbers to solve real-world problems? (E)  
How can you convert a rational number to a decimal? (I)

**Topic: Lesson 9-12 : Adding & Subtracting Fractions (E)**

Minutes for Topic: 168

**Core Lesson Student Learning Objectives:** SWBAT add & subtract fractions including real world context.

**Core Lesson Essential Questions:** How can you add, subtract, multiply and divide fractions? (E)

**Topic: Lesson 13: Adding & Subtracting Decimals (E)**

Minutes for Topic: 42

**Core Lesson Student Learning Objectives:** SWBAT add & subtract decimals including real world context.

**Core Lesson Essential Questions:** How can you add, subtract, multiply and divide decimals? (E)

**Topic: Lesson 14-16: Rational Number Adding & Subtracting Review & Assessment (E)**

Minutes for Topic: 126

**Core Lesson Student Learning Objectives:** SWBAT add and subtract rational numbers, and determine their value in real life.

**Core Lesson Essential Questions:** How can I add and subtract rational numbers? (E)  
Why are rational numbers important in real life? (E)

**Topic: Lesson 17-20: Multiplying & Dividing Fractions (E)**

Minutes for Topic: 168

**Core Lesson Student Learning Objectives:** SWBAT multiply & divide fractions including real world context.

**Core Lesson Essential Questions:** How do I multiply and divide rational fractions? (E)

**Topic: Lesson 21: Multiplying & Dividing Decimals (E)**

Minutes for Topic: 42

**Core Lesson**

**Student Learning** SWBAT multiply & divide decimals including real world context.

**Objectives:**

**Core Lesson**

**Essential Questions:** How can you multiply and divide decimals? (E)

**Topic: Lesson 22-23: Review Multiplying & Dividing Rational Numbers & Assessment (I)**

Minutes for Topic: 84

**Core Lesson**

**Essential Questions:** What do you need to know to be successful on the unit test? (I)

**Questions:**

**Topic: Lesson 24-30: Advanced Problem Solving with Rational Numbers (C)**

Minutes for Topic: 294

**Core Lesson**

**Description:** Performance tasks, group work, purple book

**Core Lesson**

**Student Learning** SWBAT apply rational numbers in the real world.

**Objectives:**

**Core Lesson**

**Essential Questions:** How can you use application of rational numbers in the real world? (C)

**Questions:**

**Unit: Ratios, Proportions, and Percent**

**Month:** October-November

**Skills:**

1. Compute unit rates associated with ratios of fractions
2. Recognize and represent proportional relationships between quantities
3. Use proportional relationships to solve multi-step ratio and percent problems

**Essential Questions:**

1. How is mathematics used to quantify, compare, represent and model numbers?
2. How can mathematics support effective communication?
3. How are relationships represented mathematically?
4. How can expressions, equations, and inequalities be used to quantify, solve, model and/or analyze mathematical situations?
5. What does it mean to estimate or analyze numerical quantities?
6. What make a tool and/or strategy appropriate for a given task?
7. How can recognizing repetition or regularity assist in solving problems more efficiently?

**Content:**

1. Mathematical relationships among numbers can be represented, compared, and communicated.
2. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.
3. Numerical quantities, calculations and measurements can be estimated or analyzed by

using appropriate strategies and tools.

4. Patterns exhibit relationships that can be extended, described and generalized.

**Assessments:** quizzes, unit 2 test

**Vocabulary:** Commission

Discount

Interest

Markup

Percent increase

Proportion

Unit rate

**Resources:** GoMath workbook

**STANDARDS: STANDARDS**

STATE: PA Core Standards (2014)

[CC.2.1.7.D.1](#)  
[\(Advanced\)](#)

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

STATE: PA Core Anchors and Eligible Content (2014)

[M07.A-R.1.1.1](#)  
[\(Advanced\)](#)

Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. 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.

Alternate Eligible Content Code M07AR1.1.1a: Find the unit rate in a real-world problem

[M07.A-R.1.1.2](#)  
[\(Advanced\)](#)

Determine whether two quantities are proportionally related (e.g., by testing for equivalent ratios in a table, graphing on a coordinate plane and observing whether the graph is a straight line through the origin).

[M07.A-R.1.1.3](#)  
[\(Advanced\)](#)

Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

Alternate Eligible Content Code M07AR1.1.3a: Represent a proportional relationship on a line graph

[M07.A-R.1.1.4](#)  
[\(Advanced\)](#)

Represent proportional relationships by equations. 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  $t = pn$ .

[M07.A-R.1.1.5](#)  
[\(Advanced\)](#)

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.

Alternate Eligible Content Code M07AR1.1.5a: Interpret an ordered pair in a real-world problem

[M07.A-R.1.1.6](#)  
[\(Advanced\)](#)

Use proportional relationships to solve multi-step ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease.

Alternate Eligible Content Code M07AR1.1.6a: Use percentages to solve a real-world problem

(\* standards consolidated from Topic level)

**Topic: Lesson 31-32: Unit Rates (E)**

Minutes for Topic: 84

**Core Lesson**

**Student Learning** SWBAT compute and apply unit rates in real world context (including unit rates with fractions).

**Objectives:**

**Core Lesson**

**Essential**

How do you find and use unit rates? (E)

**Questions:**

**STANDARDS**

STATE: PA Core Standards (2014)

[CC.2.1.7.D.1 \(Advanced\)](#) Analyze proportional relationships and use them to model and solve real-world and mathematical problems.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.A-R.1.1.1 \(Advanced\)](#) Compute unit rates associated with ratios of fractions, including ratios of lengths, areas, and other quantities measured in like or different units. 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.

Alternate Eligible Content Code M07AR1.1.1a: Find the unit rate in a real-world problem

[M07.A-R.1.1.2 \(Advanced\)](#) Determine whether two quantities are proportionally related (e.g., by testing for equivalent ratios in a table, graphing on a coordinate plane and observing whether the graph is a straight line through the origin).

[M07.A-R.1.1.3 \(Advanced\)](#) Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

Alternate Eligible Content Code M07AR1.1.3a: Represent a proportional relationship on a line graph

[M07.A-R.1.1.4 \(Advanced\)](#) Represent proportional relationships by equations. 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  $t = pn$ .

[M07.A-R.1.1.5 \(Advanced\)](#) 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.

Alternate Eligible Content Code M07AR1.1.5a: Interpret an ordered pair in a real-world problem

[M07.A-R.1.1.6 \(Advanced\)](#) Use proportional relationships to solve multi-step ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease.

Alternate Eligible Content Code M07AR1.1.6a: Use percentages to solve a real-world problem

**Topic: Lesson 33-35: Proportional Relationships (Tables, Equations & Graphs) (E)**

Minutes for Topic: 126

**Core Lesson**

SWBAT determine whether two quantities are proportionally related based on information from tables,

**Student Learning**

equations & graphs dealing with real world context.

**Objectives:**

SWBAT compute or identify the constant of proportionality from tables, equations & graphs.

**Core Lesson  
Essential  
Questions:**

How do you identify, represent and analyze proportional relationships with graphs, tables and equations? (E)

**Topic: Lesson 36-38: Unit Rate & Proportional Relationship Review & Assessment (I)**

Minutes for Topic: 126

**Core Lesson  
Essential  
Questions:**

What do you need to know in order to succeed on the unit 4 test? (I)

**Topic: Lesson 39-40: Determine Percents of Numbers (E)**

Minutes for Topic: 84

**Core Lesson  
Student Learning  
Objectives:**

SWBAT compute with percents.

**Core Lesson  
Essential  
Questions:**

How can you find the percent of a number, and convert from percent to fraction to decimal? (E)

**Topic: Lesson 41-42: Percent of Change (Increase/Decrease) (I)**

Minutes for Topic: 84

**Core Lesson  
Student Learning  
Objectives:**

SWBAT calculate percent of change in real world context.

**Core Lesson  
Essential  
Questions:**

How do you use percents to describe change? (I)

**Topic: Lesson 43-46: Application of Percents (Markup, Markdown & Commissions) (E)**

Minutes for Topic: 168

**Core Lesson  
Student Learning  
Objectives:**

SWBAT calculate percent markup, discount, tax, tip and commission in real world context.

**Core Lesson  
Essential  
Questions:**

How can you calculate percent markup, discount, tax, tip and commission? (E)

**Topic: Lesson 47-48: Simple Interest (E)**

Minutes for Topic: 84

**Core Lesson  
Student Learning  
Objectives:**

SWBAT calculate simple interest for loans and bank accounts and determine total cost in real world context.

**Core Lesson  
Essential  
Questions:**

How can you calculate simple interest for loans and bank accounts and determine total cost in real world context? (E)

**Topic: Lesson 49-55: Advance Problem Solving with Percents (C)**

Minutes for Topic: 294

**Core Lesson  
Student Learning  
Objectives:**

SWBAT use the concept of percents to solve real-world, multi-step problems.

**Core Lesson**

**Essential Questions:** How can you use the concept of percents to solve real-world, multi-step problems? (C)

**Core Lesson Materials:** GoMath purple books

**Topic: Lesson 56-60: Cumulative Review of Lessons 1-55 & Assessment (I)**

Minutes for Topic: 210

**Core Lesson Essential Questions:** What do you need to know to succeed on the unit 2 test? (I)

**Unit: Algebraic Expressions**

**Month:** December

**Skills:**

1. Add and subtract algebraic expressions (combine like terms).
2. Factor and multiply algebraic expressions (distributive property).

**Essential Questions:**

1. How is mathematics used to quantify, compare, represent, and model numbers?
2. How are relationships represented mathematically?
3. How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations?
4. How can recognizing repetition or regularity assist in solving problems more efficiently?

**Content:**

1. Mathematical relationships among numbers can be represented, compared and communicated.
2. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.
3. Patterns exhibit relationships that can be extended, described, and generalized.

**Assessments:** quizzes, unit 3 test

**Vocabulary:** Algebraic expressions  
Numerical expressions

**Resources:** GoMath workbook

**STANDARDS: STANDARDS**

STATE: PA Core Standards (2014)

[CC.2.2.7.B.3 \(Advanced\)](#) Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.B-E.2.1.1 \(Advanced\)](#) Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. 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 an hour (or  $1.1 \times \$25 = \$27.50$ ).

[M07.B-E.2.2.1](#)  
(Advanced)

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. Example: The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

Alternate Eligible Content Code M07BE2.2.1a: Select an algebraic expression (equations or inequalities) using addition or subtraction of fractions, decimals, or positive/negative integers to solve a 1-step real-world problem

[M07.B-E.2.2.2](#)  
(Advanced)

Solve word problems leading to inequalities of the form  $px + q > r$  or  $px + q < r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers, and graph the solution set of the inequality. Example: A salesperson is paid \$50 per week plus \$3 per sale. This week she wants her pay to be at least \$100. Write an inequality for the number of sales the salesperson needs to make and describe the solutions.

[M07.B-E.2.3.1](#)  
(Advanced)

Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem. Example: If you want to place a towel bar that is  $9\frac{3}{4}$  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.

Alternate Eligible Content Code M07BE2.3.1a: Identify a reasonable solution in the context of a problem using the four basic operations and numbers under 20

(\* standards consolidated from Topic level)

**Topic: Lesson 61-63: Expressions (E and I)**

Minutes for Topic: 126

**Core Lesson  
Student Learning  
Objectives:**

SWBAT apply properties of operations to distribute or combine like terms in algebraic expressions including real world context.

**Core Lesson  
Essential  
Questions:**

How do you add and subtract algebraic expressions? (E)

How do you factor algebraic expressions? (I)

How do you multiply algebraic expressions, using distributive property? (E)

**STANDARDS**

STATE: PA Core Standards (2014)

[CC.2.2.7.B.3](#) (Advanced)

Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.B-E.2.1.1](#) (Advanced)

Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. 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 an hour (or  $1.1 \times \$25 = \$27.50$ ).

[M07.B-E.2.2.1](#) (Advanced)

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. Example: The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

Alternate Eligible Content Code M07BE2.2.1a: Select an algebraic expression (equations or inequalities) using addition or subtraction of fractions, decimals, or positive/negative integers to solve a 1-step real-world problem

[M07.B-E.2.2.2](#) (Advanced)

Solve word problems leading to inequalities of the form  $px + q > r$  or  $px + q < r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers, and graph the solution set of the inequality. Example: A salesperson is paid \$50 per week plus \$3 per sale. This week

she wants her pay to be at least \$100. Write an inequality for the number of sales the salesperson needs to make and describe the solutions.

[M07.B-E.2.3.1 \(Advanced\)](#) Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem. Example: If you want to place a towel bar that is  $9\frac{3}{4}$  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.

Alternate Eligible Content Code M07BE2.3.1a: Identify a reasonable solution in the context of a problem using the four basic operations and numbers under 20

## **Unit: Algebraic Equations**

**Month:** December-January

**Skills:**

1. Model and solve real world and mathematical problems using multiple representations such as algebraic, graphical and using tables
2. Solve multi-step equations or inequalities with one variable
3. Solve and interpret multi-step real life and mathematical problems posed with positive and negative rational numbers

**Essential Questions:**

1. How is mathematics used to quantify, compare, represent, and model numbers?
2. How can mathematics support effective communication?
3. How are relationships represented mathematically?
4. How can expressions, equations and inequalities be used to quantify, solve, model and/or analyze mathematical situations?
5. How can data be organized and represented to provide insight into the relationship between quantities?
6. How does the type of data influence their choice of display?
7. How can probability and data analysis be used to make predictions?

**Content:**

1. Mathematical relationships among numbers can be represented, compared, and communicated.
2. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.
3. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions.
4. Data can be modeled and used to make inferences.

**Assessments:** Quizzes, unit 3 test

**Vocabulary:** Algebraic equations  
Coefficient  
Variable

**Resources:** GoMath workbook

**STANDARDS: STANDARDS**

STATE: PA Core Standards (2014)

[CC.2.2.7.B.3](#)  
(Advanced)

Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.B-E.2.1.1](#)  
(Advanced)

Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. 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 an hour (or  $1.1 \times \$25 = \$27.50$ ).

[M07.B-E.2.2.1](#)  
(Advanced)

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. Example: The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

Alternate Eligible Content Code M07BE2.2.1a: Select an algebraic expression (equations or inequalities) using addition or subtraction of fractions, decimals, or positive/negative integers to solve a 1-step real-world problem

[M07.B-E.2.2.2](#)  
(Advanced)

Solve word problems leading to inequalities of the form  $px + q > r$  or  $px + q < r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers, and graph the solution set of the inequality. Example: A salesperson is paid \$50 per week plus \$3 per sale. This week she wants her pay to be at least \$100. Write an inequality for the number of sales the salesperson needs to make and describe the solutions.

[M07.B-E.2.3.1](#)  
(Advanced)

Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem. Example: If you want to place a towel bar that is  $9\frac{3}{4}$  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.

Alternate Eligible Content Code M07BE2.3.1a: Identify a reasonable solution in the context of a problem using the four basic operations and numbers under 20

(\* standards consolidated from Topic level)

**Topic: Lesson 64-66: Writing & Solving 1-Step Equations (E)**

Minutes for Topic: 126

**Core Lesson**

**Student Learning** SWBAT write & solve 1-step equations with rational coefficients including real world context.

**Objectives:**

**Core Lesson**

**Essential**

How do you use one-step equations with rational coefficients to solve problems? (E)

**Questions:**

**STANDARDS**

STATE: PA Core Standards (2014)

[CC.2.2.7.B.3](#) (Advanced)

Model and solve real-world and mathematical problems by using and connecting numerical, algebraic, and/or graphical representations.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.B-E.2.1.1](#) (Advanced)

Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate. 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 an hour (or  $1.1 \times \$25 = \$27.50$ ).

[M07.B-E.2.2.1 \(Advanced\)](#) 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. Example: The perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

Alternate Eligible Content Code M07BE2.2.1a: Select an algebraic expression (equations or inequalities) using addition or subtraction of fractions, decimals, or positive/negative integers to solve a 1-step real-world problem

[M07.B-E.2.2.2 \(Advanced\)](#) Solve word problems leading to inequalities of the form  $px + q > r$  or  $px + q < r$ , where  $p$ ,  $q$ , and  $r$  are specific rational numbers, and graph the solution set of the inequality. Example: A salesperson is paid \$50 per week plus \$3 per sale. This week she wants her pay to be at least \$100. Write an inequality for the number of sales the salesperson needs to make and describe the solutions.

[M07.B-E.2.3.1 \(Advanced\)](#) Determine the reasonableness of answer(s) or interpret the solution(s) in the context of the problem. Example: If you want to place a towel bar that is  $9 \frac{3}{4}$  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.

Alternate Eligible Content Code M07BE2.3.1a: Identify a reasonable solution in the context of a problem using the four basic operations and numbers under 20

### Topic: Lesson 67-71: Writing & Solving 2-Step Equations (E)

Minutes for Topic: 210

#### Core Lesson

**Student Learning** SWBAT write & solve 2-step equations with rational coefficients including real world context.

#### Objectives:

#### Core Lesson

##### Essential

How can I write and solve 2-step equations to solve problems? (E)

#### Questions:

### Topic: Lesson 72-73: Review 1&2-Step Equations & Assessment (I)

Minutes for Topic: 84

### Topic: Lesson 74-76: 1-Step Inequalities (I)

Minutes for Topic: 126

#### Core Lesson

**Student Learning** SWBAT write and solve, & graph the solution to 1-step inequalities including real world context.

#### Objectives:

#### Core Lesson

##### Essential

How do you write and solve, & graph the solution to 1-step inequalities including real world context? (I)

#### Questions:

### Topic: Lesson 77-78: 2-Step Inequalities (I)

Minutes for Topic: 84

#### Core Lesson

**Student Learning** SWBAT write and solve, & graph the solution to 2-step inequalities including real world context.

#### Objectives:

#### Core Lesson

##### Essential

How do you write and solve, & graph the solution to 2-step inequalities including real world context? (I)

#### Questions:

### Topic: Lesson 79-80: Review of Algebraic Expressions, Equations & Inequalities & Assessment (I)

Minutes for Topic: 84

#### Core Lesson

##### Essential

What do you need to know to succeed on the unit 3 test? (I)

#### Questions:

**Unit: Area, Volume, Angles and Circumference****Month:** January-February-March

- Skills:**
1. Solve problems involving scale drawings.
  2. Identify cross sections of 3-dimensional figures.
  3. Use properties of angle types and properties of angles formed when two parallel lines are cut by a transversal line to solve problems.
  4. Solve problems involving area and circumference of a circle(s)
  5. Solve mathematical problems involving area, volume and surface area of two- and three-dimensional objects

- Essential Questions:**
1. How can patterns be used to describe relationships in mathematical situations?
  2. How can recognizing repetition or regularity assist in solving problems more efficiently?
  3. How are spatial relationships, including shape and dimension, used to draw, construct, model and represent real situations or solve problems?
  4. How can the application of attributes of geometric shapes support mathematical reasoning and problem solving?
  5. How can geometric properties and theorems be used to describe, model, and analyze situations?

- Content:**
1. Patterns exhibit relationships that can be extended, described and generalized
  2. Geometric relationships can be described, analyzed, and classified based on spatial reasoning and/or visualization

**Assessments:** quizzes, Unit 4 test**Vocabulary:**

- Acute triangle
- Adjacent angles
- Alternate exterior angles
- Area
- circumference
- Complementary angles
- Congruence
- Corresponding angles
- Cross section
- Equilateral triangle
- Isosceles triangle
- Obtuse triangle

Perimeter  
Scale Drawing  
Scalene triangle  
Similar Figures  
Surface Area

**Resources:** GoMath workbook

**STANDARDS: STANDARDS**

STATE: PA Core Standards (2014)

[CC.2.3.7.A.2 \(Advanced\)](#) Visualize and represent geometric figures and describe the relationships between them.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.C-G.1.1.1 \(Advanced\)](#) Solve problems involving scale drawings of geometric figures, including finding length and area.

Alternate Eligible Content Code M07CG1.1.1a: Solve a 1-step real-world problem related to scaling

[M07.C-G.1.1.2 \(Advanced\)](#) Identify or describe the properties of all types of triangles based on angle and side measures.

Alternate Eligible Content Code M07CG1.1.2a: Identify the properties of a right triangle

[M07.C-G.1.1.3 \(Advanced\)](#) Use and apply the triangle inequality theorem.

[M07.C-G.1.1.4 \(Advanced\)](#) Describe the two-dimensional figures that result from slicing three-dimensional figures. Example: Describe plane sections of right rectangular prisms and right rectangular pyramids.

Alternate Eligible Content Code M07CG1.1.4a: Identify a three-dimensional figure with specific attributes

(\* standards consolidated from Topic level)

**Topic: Lesson 81-83: Scale Drawings (E)**

Minutes for Topic: 126

**Core Lesson  
Student Learning  
Objectives:**

SWBAT solve problems involving scale drawings of geometric figures including length & area including real world context.

**Core Lesson  
Essential  
Questions:**

How can you use scale drawings to solve problems? (E)

**STANDARDS**

STATE: PA Core Standards (2014)

[CC.2.3.7.A.2 \(Advanced\)](#) Visualize and represent geometric figures and describe the relationships between them.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.C-G.1.1.1 \(Advanced\)](#) Solve problems involving scale drawings of geometric figures, including finding length and area.

Alternate Eligible Content Code M07CG1.1.1a: Solve a 1-step real-world problem related to scaling

[M07.C-G.1.1.2 \(Advanced\)](#) Identify or describe the properties of all types of triangles based on angle and side

measures.

Alternate Eligible Content Code M07CG1.1.2a: Identify the properties of a right triangle

[M07.C-G.1.1.3 \(Advanced\)](#) Use and apply the triangle inequality theorem.

[M07.C-G.1.1.4 \(Advanced\)](#) Describe the two-dimensional figures that result from slicing three-dimensional figures. Example: Describe plane sections of right rectangular prisms and right rectangular pyramids.

Alternate Eligible Content Code M07CG1.1.4a: Identify a three-dimensional figure with specific attributes

### Topic: Lesson 84-86: Angle Relationships (I and C)

Minutes for Topic: 126

**Core Lesson Student Learning Objectives:** SWBAT 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 including real world context.

SWBAT identify or describe the properties of all types of triangles based on angle and side measures.

SWBAT use and apply the triangle inequality theorem.

**Core Lesson Essential Questions:** How can you 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 including real world context? (I)

How can I identify or describe the properties of all types of triangles based on angle and side measures? (I)

How can I use and apply the triangle inequality theorem? (C)

### Topic: Lesson 87: Cross-Sections (C)

Minutes for Topic: 42

**Core Lesson Student Learning Objectives:** SWBAT to describe the two-dimensional figures that result from slicing 3-dimensional figures.

**Core Lesson Essential Questions:** How can you identify cross-sections of three-dimensional objects? (C)

### Topic: Lesson 88-89: Circumference & Area of Circle (E)

Minutes for Topic: 84

**Core Lesson Student Learning Objectives:** SWBAT compute the circumference & area of a circle including real world context.

**Core Lesson Essential Questions:** How do you find and use the circumference and area of a circle? (E)

### Topic: Lesson 90-93: Area & Perimeter Polygons & Composite Figures (E)

Minutes for Topic: 168

**Core Lesson Student Learning Objectives:** SWBAT compute area & perimeter of polygons & composite figures including real world context.

**Core Lesson Essential Questions:** How do you compute the perimeter and area of composite figures, including real world context? (E)

**Topic: Lesson 94-97: Surface Area (E)**

Minutes for Topic: 168

**Core Lesson**

**Student Learning Objectives:** SWBAT compute surface area of 3-dimensional figures including real world context.

**Core Lesson**

**Essential Questions:** How do you compute the surface area of three-dimensional figures, including real world context? (E)

**Topic: Lesson 98-99: Volume (E)**

Minutes for Topic: 84

**Core Lesson**

**Student Learning Objectives:** SWBAT compute volume of 3-dimensional figures including real world context.

**Core Lesson**

**Essential Questions:** How do you compute the volume of three-dimensional figures, including real world context? (E)

**Topic: Lesson 100-104: Advanced Problem Solving with Geometry (I,C)**

Minutes for Topic: 210

**Core Lesson**

SWBAT solve complex, multi-step problems involving angles and angle relationships.

**Student Learning**

**Objectives:** SWBAT solve complex, multi-step problems involving surface area and volume with real world context.

**Core Lesson**

**Essential Questions:** How do I solve complex, multi-step problems involving angles and angle relationships? (C)

**Essential**

**Questions:** How do I solve complex, multi-step problems involving surface area and volume with real world context? (I)

**Core Lesson**

**Materials:** GoMath purple books

**Topic: Lesson 105-106: Review of Geometry Unit & Assessment (I)**

Minutes for Topic: 84

**Core Lesson**

**Essential Questions:** What do you need to know to succeed on the unit 4 test?

**Unit: Data, Distributions, and Random Sampling**

**Month:** March-April

**Skills:**

1. Draw inferences about two populations based on random sampling concepts
2. Determine and approximate relative frequencies and probabilities of events
3. Draw informal comparative inferences about two populations using measures of center and measures of variability

**Essential**

1. What does it mean to estimate or analyze numerical quantities?

**Questions:**

- 2. What makes a tool and/or strategy appropriate for a given task?
- 3. How can data be organized and represented to provide insight into the relationship between quantities?
- 4. How does the type of data influence the choice of display?
- 5. How can probability and data analysis be used to make predictions?

**Content:**

- 1. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.
- 2. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions.
- 3. Data can be modeled and used to make inferences.

**Assessments:**

quizzes, unit 5 test

**Vocabulary:**

Bias  
 Data distribution  
 Population  
 Random sample

**Resources:**

GoMath workbook

**STANDARDS: STANDARDS**

STATE: PA Core Standards (2014)

[CC.2.4.7.B.1](#)  
 (Advanced) Draw inferences about populations based on random sampling concepts.

[CC.2.4.7.B.2](#)  
 (Advanced) Draw informal comparative inferences about two populations.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.D-S.1.1.1](#)  
 (Advanced) Determine whether a sample is a random sample given a real-world situation.

[M07.D-S.1.1.2](#)  
 (Advanced) Use data from a random sample to draw inferences about a population with an unknown characteristic of interest.  
 Example 1: Estimate the mean word length in a book by randomly sampling words from the book. Example 2: Predict the winner of a school election based on randomly sampled survey data.

[M07.D-S.2.1.1](#)  
 (Advanced) Compare two numerical data distributions using measures of center and variability.

Alternate Eligible Content Code M07DS2.1.1a: Compare two sets of data within a single pictograph, line plot, or bar graph  
 M07DS2.1.1b: Use measures of central tendency to interpret data, including overall patterns in the data

(\* standards consolidated from Topic level)

**Topic: Lesson 107-108: Random Samples & Population**

Minutes for Topic: 84

**Core Lesson Description:** Students will also review in Odyssey program during IHT - 1 day a cycle.

**Core Lesson Student Learning Objectives:** SWBAT determine whether a sample is a random sample given a real world situation.  
SWBAT draw inferences about populations.

**Core Lesson Essential Questions:** How can you determine whether a sample is random? (E)  
How can you use a sample to gain information about a population? (I)

## STANDARDS

STATE: PA Core Standards (2014)

[CC.2.4.7.B.1 \(Advanced\)](#) Draw inferences about populations based on random sampling concepts.

[CC.2.4.7.B.2 \(Advanced\)](#) Draw informal comparative inferences about two populations.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.D-S.1.1.1 \(Advanced\)](#) Determine whether a sample is a random sample given a real-world situation.

[M07.D-S.1.1.2 \(Advanced\)](#) Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Example 1: Estimate the mean word length in a book by randomly sampling words from the book. Example 2: Predict the winner of a school election based on randomly sampled survey data.

[M07.D-S.2.1.1 \(Advanced\)](#) Compare two numerical data distributions using measures of center and variability.

Alternate Eligible Content Code M07DS2.1.1a: Compare two sets of data within a single pictograph, line plot, or bar graph M07DS2.1.1b: Use measures of central tendency to interpret data, including overall patterns in the data

## Topic: Lesson 109-111: Analyzing & Comparing Data

Minutes for Topic: 126

**Core Lesson Description:** Students will also review in Odyssey program during IHT - 1 day a cycle.

**Core Lesson Student Learning Objectives:** SWBAT compare two data distributions using measures of center and variability (including graphs).

**Core Lesson Essential Questions:** How do you compare two sets of data displayed in dotplots? (I)  
How do you compare two sets of data displayed in boxplots? (I)  
How can you use statistical measures to compare populations? (E)

## Unit: Probability

**Month:** April

**Skills:**

1. Find probabilities of independent compound events
2. Predict the approximate relative frequency given the probability
3. Find the probability of a simple event, including the probability of a simple event not occurring

**Essential Questions:**

1. What makes a tool and/or strategy appropriate for a given task?
2. In what ways are the mathematical attributes of objects or processes measured, calculated and/or interpreted?
3. How can data be organized and represented to provide insight into the relationship between quantities?
4. How can probability and data analysis be used to make predictions?

**Content:**

1. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.
2. Measurement attributes can be quantified, and estimated using customary and non-customary units of measure.
3. Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions.
4. Data can be modeled and used to make inferences.

**Assessments:** quizzes, unit 6 test

**Vocabulary:**

- Chance event
- Compound event
- Dependent event
- Equally likely events
- Independent event
- Likely event
- Outcome
- Probability
- Process of chance
- Relative frequency

**Resources:** GoMath workbook, GoMath purple books

**STANDARDS: STANDARDS**

STATE: PA Core Standards (2014)

[CC.2.4.7.B.3 \(Advanced\)](#) Investigate chance processes and develop, use, and evaluate probability models.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.D-S.3.1.1 \(Advanced\)](#) Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (i.e., 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).

Alternate Eligible Content Code M07DS3.1.1a: Identify the probability of events occurring as possible/impossible or likely/unlikely

[M07.D-S.3.2.1](#) Determine the probability of a chance event given relative

- [\(Advanced\)](#) frequency. Predict the approximate relative frequency given the probability. 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.
- [M07.D-S.3.2.2 \(Advanced\)](#) Find the probability of a simple event, including the probability of a simple event not occurring. Example: What is the probability of not rolling a 1 on a number cube?
- [M07.D-S.3.2.3 \(Advanced\)](#) Find probabilities of independent compound events using organized lists, tables, tree diagrams, and simulation.

(\* standards consolidated from Topic level)

## Topic: Lesson 112-114: Probability

Minutes for Topic: 126

- Core Lesson Description:** Students will also review in Odyssey program during IHT - 1 day a cycle.
- Core Lesson Student Learning Objectives:** SWBAT determine the theoretical probability of a simple event and independent compound events.  
SWBAT determine the experimental probability and predict events based on outcome.
- Core Lesson Essential Questions:**
- How can you describe the likelihood of an event? (E)
  - How do you find the experimental probability of a simple event? (E)
  - How do you find the experimental probability of a compound event? (I)
  - How do you make predictions using experimental probability? (I)
  - How do you find the theoretical probability of a simple event? (E)
  - How do you find the theoretical probability of a compound event? (I)
  - How do you make predictions using theoretical probability? (I)

## STANDARDS

STATE: PA Core Standards (2014)

[CC.2.4.7.B.3 \(Advanced\)](#) Investigate chance processes and develop, use, and evaluate probability models.

STATE: PA Core Anchors and Eligible Content (2014)

[M07.D-S.3.1.1 \(Advanced\)](#) Predict or determine whether some outcomes are certain, more likely, less likely, equally likely, or impossible (i.e., a probability near 0 indicates an unlikely event, a probability around  $\frac{1}{2}$  indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event).

Alternate Eligible Content Code M07DS3.1.1a: Identify the probability of events occurring as possible/impossible or likely/unlikely

[M07.D-S.3.2.1 \(Advanced\)](#) Determine the probability of a chance event given relative frequency. Predict the approximate relative frequency given the probability. 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.

[M07.D-S.3.2.2 \(Advanced\)](#) Find the probability of a simple event, including the probability of a simple event not occurring. Example: What is the probability of not rolling a 1 on a number cube?

[M07.D-S.3.2.3 \(Advanced\)](#) Find probabilities of independent compound events using organized lists, tables, tree diagrams, and simulation.

**Unit: Common Core & Test Taking Strategy Review**

**Month:** September, January, April

**Resources:** GoMath purple books  
Green Common Core books  
EdInsight benchmark test review

**Topic: Lesson 115-120: Common Core & Test Taking Strategy Review**

Minutes for Topic: 252

**Core Lesson**

**Essential Questions:** What do I need to know in order to succeed on the PSSA test? (I)