Brigantine Public School District
ENGAGING STUDENTS • FOSTERING ACHIEVEMENT • CULTIVATING 21ST CENTURY GLOBAL SKILLS

Curriculum Map

Content Area: Mathematics

Course Title: Grade 7 Mathematics Advanced | **Grade Level: 7**

Unit 1-Operations with Integers	20 days
Unit 2-Expressions and Equations	20 days
Unit 3-Proportions and Percent	20 days
Unit 4A-Geometry	20 days
Unit 4B-Geometry	15 days
Unit 5-Prob & Stat	20 days
Unit 6-Linear Equations and Functions	20 days
Unit 7: The Pythagorean Theorem, Exponents and Sci Notation	20 days

Date Revised: **August 2015**

Board Approved on: **August 27, 2015**

Unit 1 Overview
Content Area: Mathematics
Unit 1 Title: Integer Operations and Rational Numbers
Grade Level: 7
Unit Summary: Integers and absolute value; adding, subtracting, multiplying, and dividing integers; the coordinate plane; Rational numbers; adding, subtracting, multiplying, and dividing rational numbers. **Primary interdisciplinary connections:** Science/Social Studies/Reading/Language Arts **9.1.8.B.7** Construct a budget to save for long-term, short-term, and charitable goal. **9.1.8.B.8** Develop a system for keeping and using financial records.   **21st century themes:**   - Information and communication skills   - Higher order thinking skills   - Problem solving skills   - Independent learners   - Real-world connections   **CRP2**. Apply appropriate academic and technical skills. **CRP4**. Communicate clearly and effectively with reason. **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.
Learning Targets
Mathematical Practices

CC.K-12.MP.1	Make sense of problems and persevere in solving them.
CC.K-12.MP.2	Reason abstractly and quantitatively.

Unit Essential Questions
- How are velocity and speed related?
- Is the sum of two integers *positive*, *negative*, or *zero*? How can you tell?
- How are adding integers and subtracting integers related?
- Is the product of two integers *positive*, *negative*, or *zero*? How can you tell?
- Is the quotient of two integers *positive*, *negative*, or *zero*? How can you tell?
- How can you use ordered pairs to locate points in a coordinate plane?
- How can you use a number line to order rational numbers?
- How does adding and subtracting rational numbers compare with adding and subtracting integers?
- How can you use operations with rational numbers in a story?

Student Learning Objectives
- The absolute value of an integer is the distance between the number and 0 on a number line. The absolute value of a number a is written as $|a|$.

- Add the absolute values of the integers. Then use the common sign.
- To subtract an integer, add its opposite.
- The product or quotient of two integers with the same sign is positive.
- The product or quotient of two integers with different signs is negative.
- A coordinate plane is formed by the intersection of a horizontal number line and a vertical number line. The number lines intersect at the origin and separate the coordinate plane into four regions called quadrants.
- A rational number is a number that can be written as the ratio of two integers.
- To add, subtract, multiply, or divide rational numbers, use the same rules for signs as you used for integers.
- Changing the order or grouping of addends or factors does not change the sum or product.

CPI #	Cumulative Progress Indicator (CPI)
7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.
7.NS.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.1c	Understand subtraction of rational numbers as adding the additive inverse, $p - q = p + (-q)$. Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.
7.NS.1d	Apply properties of operations as strategies to add and subtract rational numbers.
7.NS.2a	Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as $(-1)(-1) = 1$ and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.
7.NS.2c	Apply properties of operations as strategies to multiply and divide rational numbers.
7.NS.2b	Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$. Interpret quotients of rational numbers by describing real-world contexts.
7.NS.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.

Unit Vocabulary

● Absolute value ● Opposites ● Additive inverse ● Y-axis ● Rational number ● Terminating decimal	

Evidence of Learning

Summative Assessment:

- Chapter Review/Test
- Performance Assessment
- Chapter Test
- Online Assessment
- PARCC

Benchmark Assessment - Teacher Created Benchmarks

Equipment needed: Big Ideas Textbook**,** Manipulatives Kits; Differentiated Centers

Teacher Resources:

https://sites.google.com/site/brigantinemath/home

www.bigideasmath.com

Modifications: (Special Education, ELL, Gifted and Talented)

- Tiered Assignments
- Games
- Menus/Choice Boards
- Flexible grouping
- Individualizing lessons
- Compacting
- Varying question levels

Formative Assessments

- Lesson Quick Check
- Mid-Chapter Checkpoint

Unit 2 Overview
Content Area: Mathematics
Unit 2 Title: Expressions, Equations, and Inequalities
Grade Level: 7
Unit Summary: Algebraic Expressions; Adding and Subtracting Linear Equations; Solving Equations using Addition, Subtraction, Multiplication, and Division; Solving Two-Step Equations; Writing and Graphing Inequalities; Solving Inequalities using Addition, Subtraction, Multiplication, and Division; Solving Two-Step Inequalities
Primary interdisciplinary connections: Science/Social Studies/Reading/Language Arts
MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
21st century themes: ● Information and communication skills   ● Higher order thinking skills   ● Problem solving skills   ● Independent learners   ● Real-world connections
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
Learning Targets
Mathematical Practices

CC.K-12.MP.1	Make sense of problems and persevere in solving them.
CC.K-12.MP.2	Reason abstractly and quantitatively.

Unit Essential Questions
- How can you use inverse operations to solve an equation and/or inequality?
- How can you use multiplication or division to solve an equation and/or inequality?
- In a two-step equation, which step should you do first?
- How do you write an graph an inequality?

Student Learning Objectives
- Two equations are equivalent equations if they have the same solutions. Adding the same number to each side of an equation produces an equivalent equation.
- Multiplying each side of an equation by the same number produces an equivalent equation.
- Dividing each side of an equation by the same number produces an equivalent equation.
- If you add the same number to each side of an inequality, the inequality remains true.
- If you subtract the same number from each side of an inequality, the inequality

remains true.
- If you multiply or divide each side of an inequality by the same positive number, the inequality remains true.
- If you multiply or divide each side of an inequality by the same negative number, the direction of the inequality symbol must be reversed for the inequality to remain true.

CPI #	Cumulative Progress Indicator (CPI)
7.NS.3	Solve real-world and mathematical problems involving the four operations with rational numbers.
7.EE.1	Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.
7.EE.2	Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
7.EE.4a	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*
7.EE.4b	Solve word problems leading to inequalities of the form $px+q > r$ or $px + q < r$, where p, q, are r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem.

Unit Vocabulary

● Like Terms ● Simplest form	● Linear Expression ● Factoring an Expression

Evidence of Learning

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- Chapter Test
- Online Assessment
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Benchmark Assessment - Teacher Created Benchmark

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- Compacting
- Varying question levels

Formative Assessments

- Lesson Quick Check
- Mid-Chapter Checkpoint

Unit 3 Overview
Content Area: Mathematics
Unit 3 Title: Proportions and Percents
Grade Level: 7
Unit Summary: Ratios and rates; proportions; writing proportions; solving proportions; slope; direct variation; percents and decimals; comparing and ordering fractions, decimals, and percents; the percent equation; percents of increase and decrease; discounts and markups; simple interest. **Primary interdisciplinary connections:** Science/Social Studies/Reading/Language Arts **MS-PS3-1.** Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of the object.   **21st century themes:**   - Information and communication skills   - Higher order thinking skills   - Problem solving skills   - Independent learners   - Real-world connections   **CRP2**. Apply appropriate academic and technical skills. **CRP4**. Communicate clearly and effectively with reason. **CRP8.** Utilize critical thinking to make sense of problems and persevere in solving them.
Learning Targets
Mathematical Practices

CC.K-12.MP.1	Make sense of problems and persevere in solving them.
CC.K-12.MP.2	Reason abstractly and quantitatively.

Unit Essential Questions
- How do rates help you describe real-life problems?
- How can proportions help you decide when things are "fair"?
- How can you write a proportion that solves a problem in real life?
- How can you use ratio tables and cross products to solve proportions?
- How can you compare two rates graphically?
- How can you use a graph to show the relationship between two variables that vary directly? How can you use an equation?
- How does the decimal point move when you rewrite a percent as a decimal and when you rewrite a decimals as a percent?
- How can you order numbers that are written as fractions, decimals, and percents?
- How can you use models to estimate percent questions?
- How can you use an equivalent form of the percent proportion to solve a percent problem?
- What is a percent of decrease? What is a percent of increase?

- How can you find discounts and selling prices?
- How can you find the amount of simple interest earned on a savings account?
  How can you find the amount of interest owed on a loan?

Student Learning Objectives

- A proportion is an equation stating that two ratios are equivalent. Two quantities that form a proportion are proportional.
- Two quantities x and y show direct variation when y=kx, where k is a number and k≠0.
- A percent is a ratio whose denominator is 100.
- When the original amount increases, the percent of change is called a percent of increase.
- When the original amount decreases, the percent of change is called a percent of decrease.
- A discount is a decrease in the original price of an item.
- Simple interest is money paid or earned only on the principal.

CPI #	Cumulative Progress Indicator (CPI)
7.RP.1	Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. *For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction $^{1/2}/_{1/4}$ miles per hour, equivalently 2 miles per hour*.
7.RP.2b	Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.
7.RP.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.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.
7.RP.3	Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
7.RP.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.EE.3	Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. *For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of*

$27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

Unit Vocabulary

- Ratio
- Rate
- Unit rate
- Slope
- Proportion
- Complex fraction

- Proportional
- Cross products
- Direct variation
- Constant of proportionality

Evidence of Learning

Summative Assessment:
- Chapter Review/Test
- Performance Assessment
- Chapter Test
- Online Assessment
- PARCC

Benchmark Assessment: Teacher created benchmark

Equipment needed: Big Ideas Textbook, Manipulatives Kits; Differentiated Centers

Teacher Resources:

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www.BigIdeasMath.com

Modifications: (Special Education, ELL, Gifted and Talented)
- Tiered Assignments
- Games
- Menus/Choice Boards
- Flexible grouping
- Individualizing lessons
- Compacting
- Varying question levels

Formative Assessments

- Lesson Quick Check
- Mid-Chapter Checkpoint

Unit 4a Overview
Content Area: Mathematics
Unit 4a Title: Area, Circumference, Surface Area and Volume.
Grade Level: 7

Unit Summary: Area and circumference of circles; drawing 3-dimensional figures; surface areas of prisms; surface areas of cylinders; surface areas of pyramids; surface areas of cones; surface areas of composite solids; volume of prisms; volume of cylinders; volume of pyramids; volume of composite solids; surface areas and volumes of similar solids.
 	
Primary interdisciplinary connections: Science/Social Studies/Reading/Language Arts
MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of the object.
    21st century themes:
      ● Information and communication skills
      ● Higher order thinking skills
      ● Problem solving skills
      ● Independent learners
      ● Real-world connections
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

Learning Targets
Mathematical Practices

CC.K-12.MP.1	Make sense of problems and persevere in solving them.
CC.K-12.MP.2	Reason abstractly and quantitatively.

Unit Essential Questions
- How can you find the area of a circle?
- How can you find the circumference of a circle?
- How can you draw three-dimensional figures?
- How can you use a net to find the surface area of a prism?
- How can you find the surface are of a cylinder?
- How can you find the surface area of a pyramid?
- How can you find surface area of a cone?
- How can you find the surface area of a composite solid?
- How can you find the volume of a prism?
- How can you find the volume of a cylinder?
- How can you find the volume of a pyramid?

- How can you remember the formulas for surface area and volume?
- How can you estimate the volume of a composite solid?
- When the dimensions of a solid increase by a factor of k, how does the surface area change? How does the volume change?

Student Learning Objectives

- A prism is a polyhedron that has two parallel, identical bases. The lateral faces are parallelograms.
- The surface area S of a rectangular prism is the sum of the areas of the bases and the lateral faces.
- The diameter d of a circle is twice the radius r. The radius r of a circle is one-half the diameter d.
- The surface area S of a cylinder is the sum of the areas of the bases and the lateral surface.
- The surface area S of a pyramid is the sum of the areas of the base and the lateral faces.
- The surface area S of a cone is the sum of the areas of the base and the lateral surface.
- The volume V of a prism is the product of the area of the base and the height of the prism.
- The volume V of a cylinder is the product of the area of the base and the height of the cylinder.
- The volume V of a pyramid is one-third the product of the area of the base and the height of the pyramid.
- The volume V of a cone is one-third the product of the area of the base and the height of the cone.
- If two solids are similar, then the ratio of their volumes is equal to the cube of the ratio of their corresponding linear measure.

CPI #	Cumulative Progress Indicator (CPI)
7.G.3	Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.
7.G.4	Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.
7.G.6	Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.
8.G.9	Know the formulas for volume of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Unit Vocabulary

- Three-dimensional figure
- Polyhedron
- Lateral face
- Surface area
- Net

- Regular pyramid
- Slant height
- Composite solid
- Similar Solid
- Volume

Evidence of Learning

Summative Assessment:

- Chapter Review/Test
- Performance Assessment
- Chapter Test
- Online Assessment
- PARCC

Equipment needed: Manipulatives Kits; Differentiated Centers; www.bigideasmath.com

https://sites.google.com/site/brigantinemath/home

Modifications: (Special Education, ELL, Gifted and Talented)

- Tiered Assignments
- Games
- Menus/Choice Boards
- Flexible grouping
- Individualizing lessons
- Compacting
- Varying question levels

Unit 4b Overview

Content Area: Mathematics

Unit 4b Title: Angles, Similarity and Transformations

Grade Level: 7

Unit Summary: Classifying angles; angles and sides of triangles; angles of polygons; using similar triangles; parallel lines and transversals; identifying similar figures; perimeters and areas of similar figures; finding unknown measures in similar figures; scale drawings; translations; reflections; rotations.

Primary interdisciplinary connections: Science/Social Studies/Reading/Language Arts

MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

21st century themes:
- Information and communication skills
- Higher order thinking skills
- Problem solving skills
- Independent learners
- Real-world connections

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively with reason.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

Learning Targets

Mathematical Practices

CC.K-12.MP.1	Make sense of problems and persevere in solving them.
CC.K-12.MP.2	Reason abstractly and quantitatively.

Unit Essential Questions

How can you classify two angles as complementary or supplementary?

How can you classify triangles by their angles?

How can you find a formula for the sum of the angle measures of a polygon?

How can you use proportions to help make decisions in art, design, and magazine layouts?

How do changes in dimensions of similar geometric figures affect the perimeters and areas of the figures?

What information do you need to know to find the dimensions of a figure that is similar to another figure?

How can you use a scale drawing to estimate the cost of painting a room?

How can you use translations to make a tessellation?

How can you use reflections to classify a frieze pattern?

What are the three basic ways to move an object in a plane?

Student Learning Objectives

- Two angles are complementary angles if the sum of their measures is 90°.
- Two angles are supplementary angles if the sum of their measures is 180°.
- Two angles are congruent if they have the same measure.
- The sum of the angle measures of a triangle is 180°.
- Figures that have the same shape but not necessarily the same size are called similar figures.
- If two figures are similar, then the ratio of their perimeters is equal to the ratio of their corresponding side lengths.
- If two figures are similar, then the ratio of their areas is equal to the ratio of their corresponding side lengths.
- Two triangles have the same angle measures if and only if they are similar.
- A scale drawing is a proportional two-dimensional drawing of an object. A scale model is a proportional three-dimensional model of an object.
- A translation is a transformation in which a figure slides but does not turn. Every point of the figure moves the same distance and in the same direction.
- A reflection, or flip, is a transformation in which a figure is reflected in a line called the line of reflection.   A reflection creates a mirror image of the original figure.
- A rotation, or turn, is a transformation in which a figure is rotated about a point called the center of rotation. The number of degrees a figure rotates is the angle of rotation.

CPI #	Cumulative Progress Indicator (CPI)
7.G.1	Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.
7.G.2	Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.
7.G.5	Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.
8.G.1	Verify experimentally the properties of rotations, reflections, and translations.
8.G.3	Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
8.G.5	Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*

Unit Vocabulary

- Complementary angles
- Supplementary angles
- Congruent angles
- Vertical angles
- Similar figures
- Corresponding angles/sides
- Indirect measurement
- Scale drawing/model
- Scale
- Scale factor

- Transformation
- Image
- Translation
- Reflection
- Line of reflection
- Rotation
- Center of rotation
- Angle of rotation
- Parallel Lines
- Transversal

Evidence of Learning

Summative Assessment:
- Chapter Review
- Performance Assessment
- Chapter Test
- Online Assessment
- PARCC

Benchmark Assessment: Teacher Created Benchmark

Equipment needed: Big Idea Textbook, Manipulatives Kits; Differentiated Centers

Teacher Resources:

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Modifications: (Special Education, ELL, Gifted and Talented)
- Tiered Assignments
- Games
- Menus/Choice Boards
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- Compacting
- Varying question levels

Formative Assessments

- Lesson Quick Check

- Mid-Chapter Checkpoint

Unit 5 Overview
Content Area: Mathematics
Unit 5 Title: Probability and Statistics
Grade Level: 7

Unit Summary: Introduction to probability; theoretical probability; experimental probability; independent and dependent events. Stem-and-leaf plots; histograms; circle graphs; samples and populations.
 	
Primary interdisciplinary connections: Science/Social Studies/Reading/Language Arts
MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.
    21st century themes:
      ● Information and communication skills
      ● Higher order thinking skills
      ● Problem solving skills
      ● Independent learners
      ● Real-world connections
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

Learning Targets
Mathematical Practices

CC.K-12.MP.1	Make sense of problems and persevere in solving them.
CC.K-12.MP.2	Reason abstractly and quantitatively.

Unit Essential Questions

How can you predict the results of spinning a spinner?

How can you find a theoretical probability?

What is meant by experimental probability?

What is the difference between dependent and independent events?

How can you use a stem-and-leaf plot to organize a set of numbers?

How do histograms show the differences in distributions of data?

How can you use a circle graph to show the results of a survey?

How can you use a survey to make conclusions about the general population?

Student Learning Objectives

- An experiment is an activity with varying results. The possible results of an experiment are called outcomes. A collection of one or more outcomes is an event. The outcomes of a specific event are called favorable outcomes.
- When all possible outcomes are equally likely, the theoretical probability of an event is

- the ratio of the number of favorable outcomes to the number of possible outcomes.
- Probability that is based on repeated trials of an experiment is called experimental probability.
- The probability of two independent events *A* and *B* is the probability of *A* times the probability of *B.*
- A stem-and-leaf plot uses the digits of data values to organize a data set. Each data value is broken into a stem and a leaf.
- A histogram is a bar graph that shows the frequency of data values in intervals of the same size.
- A circle graph displays data as sections of a circle.
- A population is an entire group of people of objects. A sample is a part of the population.

CPI #	Cumulative Progress Indicator (CPI)
7.SP.5	Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.
7.SP.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.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?*
7.SP.6	Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times*.
7.SP.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.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.1	Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.
7.SP.2	Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. *For example, estimate the mean*

	word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.
7.SP.3	Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. *For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.*

Unit Vocabulary

- Stem-and-leaf plot
- Stem
- Leaf
- Histogram
- Experiment
- Outcomes
- Event
- Probability
- Theoretical probability

- Circle graph
- Population
- Sample
- Fair experiment
- Experimental probability
- Independent events
- Dependent events

Evidence of Learning

Summative Assessment:
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Benchmark Assessments - Teacher Created Benchmark

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Big Ideas Text, www.bigideasmath.com

Modifications: (Special Education, ELL, Gifted and Talented)

Tiered Assignments
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Compacting
Varying question levels

Formative Assessments

- Lesson Quick Check
- Mid-Chapter Checkpoint

Unit 6 Overview

Content Area: Mathematics

Unit 6 Title: Linear Equations and Functions

Grade Level: 7

Unit Summary: Solving multi-step equations; solving equations with variables on both sides; solving equations using tables and graphs; slope of a line; linear functions.

Primary interdisciplinary connections: Science/Social Studies/Reading/Language Arts

MS-PS2-1. Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.

21st century themes:

- Information and communication skills
- Higher order thinking skills
- Problem solving skills
- Independent learners
- Real-world connections

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively with reason.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

Learning Targets

Mathematical Practices

CC.K-12.MP.1	Make sense of problems and persevere in solving them.
CC.K-12.MP.2	Reason abstractly and quantitatively.

Unit Essential Questions

How can you convert temperatures between the Fahrenheit and Celsius scales?

How can you solve an equation that has variables on both sides?

How can you use tables and graphs to solve equations?

How can you describe the graph of an equation of the form $y=mx+b$?

Student Learning Objectives

- Use algebra.
- Use a table. Find the value of the variable that makes the value of each side of the equation the same.
- Use a graph. Graph each side of the equation. The x-coordinate of the point of intersection is the solution of the equation.
- The slope of a line is a ratio of the change in y (the rise) to the change in x (the run) between any two points on the line.

- A linear function written in the form $y=mx+b$ is in slope-intercept form. The graph of the function is a line whose slope is m and whose y-intercept is b.

CPI #	Cumulative Progress Indicator (CPI)
7.EE.4a	Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. *For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?*
8.EE.7a	Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
8.EE.7b	Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
8.EE.6	Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b.

Unit Vocabulary

- Slope - Rise - Run	- Linear function - y-intercept - Slope-intercept

Evidence of Learning

Summative Assessment:
- Chapter Review/Test
- Performance Assessment
- Chapter Test
- Online Assessment

Equipment needed: Manipulatives Kits; Differentiated Centers

Teacher Resources: https://sites.google.com/site/brigantinemath/home

wwwk-6.thinkcentral.com

Modifications: (Special Education, ELL, Gifted and Talented)
Tiered Assignments
Games
Menus/Choice Boards
Flexible grouping
Individualizing lessons
Compacting
Varying question levels

Formative Assessments

- Lesson Quiz
- Mid Chapter Checkpoint

Unit 7 Overview

Content Area: Mathematics

Unit 7 Title: Pythagorean Theorem, Exponents, and Scientific Notation

Grade Level: 7

Unit Summary: Finding square roots; the Pythagorean theorem; approximating square roots; simplifying square roots; using the Pythagorean theory, Exponents; product of powers property; quotient of powers property; zero and negative exponents; reading scientific notation; writing scientific notation.

Primary interdisciplinary connections: Science/Social Studies/Reading/Language Arts
MS-PS3-1. Construct and interpret graphical displays of data to describe the relationships of kinetic energy to the mass of an object and to the speed of an object.

21st century themes:
- Information and communication skills
- Higher order thinking skills
- Problem solving skills
- Independent learners
- Real-world connections

CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP11. Use technology to enhance productively.

Learning Targets

Mathematical Practices

CC.K-12.MP.1	Make sense of problems and persevere in solving them.
CC.K-12.MP.2	Reason abstractly and quantitatively.

Unit Essential Questions
How can you find the side length of a square when you are given the area of the square?
How are the lengths of the sides of a right triangle related?
How can you find decimal approximations of square roots that are irrational?
How can you use a square root to describe the golden ratio?
How can you use the Pythagorean Theorem to solve real-life problems?
How can you use exponents to write numbers?

How can you multiply or divide two powers that have the same base?

How can you define zero and negative exponents?

How can you read numbers that are written in scientific notation?

How can you write a number in scientific notation?

Student Learning Objectives

- The sides of a right triangle have special names.
- Rational numbers and irrational numbers together form the set of real numbers.
- When using the converse of the Pythagorean Theorem, always substitute the length of the longest side for *c*.
- To multiply or divide powers with the same base, add their exponents.
- Any nonzero number to the zero power is equal to 1. Zero to the zero power is *undefined*.
- A number is written in scientific notation when it is represented as the product of a factor and a power of 10. The factor must be at least 1 and less than 10.
- When writing a number from scientific notation to standard form, the absolute value of the exponent tells you how many places to move the decimal point.
- Writing numbers in scientific notation: move the decimal point to the right of the first nonzero digit; count the number of places you moved the decimal point. This determines the exponent of the power of 10.

CPI #	Cumulative Progress Indicator (CPI)
8.EE.2	Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.
8.G.6	Explain a proof of the Pythagorean Theorem and its converse.
8.G.7	Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.
8.NS.1	Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion which repeats eventually into a rational number.
8.NS.2	Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., π^2). *For example, by truncating the decimal expansion of √2, show that √2 is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations*.
8.G.8	Apply the Pythagorean Theorem to find the distance between two points in a

	coordinate system.
8.EE.1	Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $3^2 \times 3^{-5} = 3^{-3} = 1/3^3 = 1/27$.
8.EE.3	Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3 times 10^8 and the population of the world as 7 times 10^9, and determine that the world population is more than 20 times larger.*
8.EE.4	Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

Unit Vocabulary

- Square root
- Perfect square
- Radical sign
- Radicand
- Cube Root
- Perfect Cube
- Theorem
- Legs
- Hypotenuse
- Pythagorean Theorem
- Irrational number
- Real numbers
- Pythagorean Formula
- Power
- Base
- Exponent
- Scientific Notation

Evidence of Learning

Summative Assessment:
- Chapter Review/Test
- Performance Assessment
- Chapter Test
- Online Assessment

- PARCC

Equipment needed: Manipulatives Kits; Differentiated Centers

Teacher Resources:

https://sites.google.com/site/brigantinemath/home

www.bigideasmath.com

Modifications: (Special Education, ELL, Gifted and Talented)

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Formative Assessments

      Lesson Quick Check

      Mid-Chapter Checkpoint