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

Curriculum Map	
Content Area: Mathematics	
Course Title: Grade 7 Mathematics	**Grade Level: 7**

Unit 1-Operations with Integers	25 days
Unit 2-Expressions and Equations	30 days
Unit 3-Proportions and Percents	35 days
Unit 4 - Geometry	35 days
Unit 5-Prob and Stat	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

- Coordinate plane
- Origin
- Quadrants
- X-axis
- Repeating decimal

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:

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

- Equivalent equations
- Inequality
- Solution of an Inequality
- Solution Set
- Graph of an Inequality

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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

- Percent
- Percent of change
- Percent of increase
- Percent of decrease
- Percent error
- Discount
- Markup
- Interest
- Principal
- Simple interest

Evidence of Learning

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- Chapter Test
- Online Assessment
- PARCC

Benchmark Assessment: Teacher created benchmark

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

Formative Assessments

- Lesson Quick Check

- Mid-Chapter Checkpoint

Unit 4 Overview
Content Area: Mathematics
Unit 4 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-PS3-2.** Develop a model to describe that when the arrangement of objects interacting at a distance changes, different amounts of potential energy are stored in the system.   **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 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?
- How can you use proportions to help make decisions in art, design, and magazine layouts?

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.
- A scale drawing is a proportional two-dimensional drawing of an object. A scale model is a proportional three-dimensional model of an object.

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 drawings at a different scale.
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.

Unit Vocabulary	
● Three-dimensional figure ● Polyhedron ● Lateral face ● Surface area ● Net ● Volume	● Regular pyramid ● Slant height ● Composite solid ● Similar Solids

Evidence of Learning

Summative Assessment:
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Benchmark Assessment: Teacher Created Benchmark

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Teacher Resources:

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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 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

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