7th Grade SPED Resource Mathematics Curriculum

Course Description: In grade 7, instructional time should focus on four critical areas: (1) developing understanding of and applying proportional relationships; (2) developing understanding of operations with rational numbers and working with expressions and linear equations; (3) solving problems involving scale drawings and informal geometric constructions, and working with two-and three-dimensional shapes to solve problems involving area, surface area, and volume; and (4) drawing inferences about populations based on samples.

Scope and Sequence:

Time Frame	Unit
18 blocks	Rational Numbers
18 blocks	Expressions, Equations, and Inequalities
19 blocks	Ratios/Proportions/Percents
12 blocks	Probability and Statistics
7 blocks	Geometric Shapes and Angles
9 blocks	Surface Area and Volume

*This document contains the entire 7th Grade Math curriculum that is taught in a regular education setting. Items that are highlighted in yellow have been designated as priority information that should be taught in the 7th Grade SPED Resource Math class.

Curriculum Revision Tracking

Spring 2020
- Two days were added after the Chapter 2 test to spend time reviewing Order of Operations, with an emphasis on exponents in order to prepare students to work with exponents and negative numbers

- **Unit 2: Expressions, Equations & Inequalities**
  - Chapter 3: Expressions
    - Teach 3.3 Distributive property, before 3.2, adding and subtracting linear expressions
    - Adjusted timing of lessons
  - Chapter 4: Equations and Inequalities
    - Combine 4.1 and 4.2 as one lesson
    - Adjusted timing of lessons

- **Unit 3: Ratios/Proportions/Percents**
  - Chapter 5: Ratios and Proportions
    - Adjusted timing of lessons
  - Chapter 6: Percents
    - Combine lessons 6.2 and 6.3 into one block, to teach students both strategies at the same time and let them choose which strategy they prefer.

- **Unit 4: Probability and Statistics**
  - Chapter 7: Probability
    - Omit 7.4
  - Chapter 8: Statistics
    - Omit 8.3 and 8.4

- **Unit 5: Geometric Shapes and Angles**
  - Chapter 9: Geometric Shapes and Angles
    - In 9.3, only focus on composite figures
    - Omit 9.4

Unit 1: Rational Numbers

Subject: Mathematics
Grade: 7th Grade
Name of Unit: Rational Numbers
Length of Unit: 18 Blocks (36 days)
Overview of Unit: Students develop a unified understanding of number, recognizing fractions, decimals (that have a finite or a repeating decimal representation), and percents as different representations of rational numbers. Students extend addition, subtraction, multiplication, and division to all rational numbers, maintaining the properties of operations and the relationships between addition and subtraction, and multiplication and division. By applying these properties, and by viewing negative numbers in terms of everyday contexts (e.g., amounts owed or temperatures below zero), students explain and interpret the rules for adding, subtracting, multiplying, and dividing with negative numbers. They use the arithmetic of rational numbers as they formulate expressions and equations in one variable and use these equations to solve problems.

Priority Standards for unit:
- MA.7.NS.A.2: Apply and extend previous understandings of numbers to multiply and divide rational numbers.
    a. Multiply and divide rational numbers.
    b. Determine that a number and its reciprocal have a product of 1 (multiplicative inverse).
    c. Understand that every quotient of integers (with non-zero divisor) is a rational number.
    d. Convert a rational number to a decimal.
- MA.7.NS.A.3: Solve problems involving the four arithmetic operations with rational numbers.
- MA.7.EEI.B.1: Solve multi-step problems posed with rational numbers.
    a. Convert between equivalent forms of the same number.
    b. Assess the reasonableness of answers using mental computation and estimation strategies.
- MA.7.EEI.B.2: Write and/or solve linear equations and inequalities in one variable.
    a. Write and/or solve equations of the form $x+p = q$ and $px = q$ in which p and q are rational numbers.
    b. Write and/or solve two-step equations of the form $px + q = r$ and $p(x + q) = r$, where p, q and r are rational numbers, and interpret the meaning of the solution in the context of the problem.
    c. Write, solve and/or graph inequalities of the form $px + q > r$ or $px + q < r$, where p, q and r are rational numbers.

Supporting Standards for unit:

- MA.7.NS.A.1: Apply and extend previous understandings of numbers to add and subtract rational numbers.
  - a. Add and subtract rational numbers.
  - b. Represent addition and subtraction on a horizontal or vertical number line.
  - c. Describe situations and show that a number and its opposite have a sum of 0 (additive inverses).
  - d. Understand subtraction of rational numbers as adding the additive inverse.
  - e. Determine the distance between two rational numbers on the number line is the absolute value of their difference.
  - f. Interpret sums and differences of rational numbers.
- MA.7.EEI.A.1: Apply properties of operations to simplify and to factor linear algebraic expressions with rational coefficients.
- MA.7.EEI.A.2: Understand how to use equivalent expressions to clarify quantities in a problem. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."

Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
7.NS.A.2a	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 $(-1)(-1) = 1$	Understand	Understand	1
7.NS.A.2a	The rules for multiplying signed numbers	Understand	Understand	1
7.NS.A.2a	Products of rational numbers by describing real-world contexts	Interpret	Evaluate	3
7.NS.A.2a	That integers can be divided, provided that the divisor is not zero a	Understand	Understand	1
7.NS.A.2c	Every quotient of integers (with non-zero divisor) is a rational number	Understand	Understand	1
7.NS.A.2a	If p and q are integers, then -(p/q) = (-p)/q = p/(-q)	Understand	Understand	1
7.NS.A.2a	Properties of operations as strategies to multiply rational numbers	Apply	Apply	2
7.NS.A.2d	Properties of operations as strategies to	Apply	Apply	2

	divide rational numbers			
7.NS.A.2d	A rational number to a decimal using division	Convert	Apply	1
7.NS.A.3	Real-world problems involving the four operations with rational numbers.	Solve	Apply	2
7.NS.A.3	Mathematical problems involving the four operations with rational numbers	Solve	Apply	2

Essential Questions:
1. How can you identify different types of rational numbers?
2. How can you solve problems by adding the different types of rational numbers?
3. How can you solve problems by subtracting the different types of rational numbers?
4. How can models and relationships help you make sense of multiplying and dividing positive and negative rational numbers?
5. Fractions, decimals, and percents - when is it most helpful to use each representation?

Enduring Understanding/Big Ideas:
1. Rational numbers are positive and negative fractions, integers, and decimals (and their opposites).
2. You can solve problems that involve adding and subtracting all kinds of positive and negative fractions, decimals, and integers.
3. You can solve problems that involve adding and subtracting all kinds of positive and negative fractions, decimals, and integers.
4. Ways you can model multiplication/division is:
   a. multiplications is repeated addition, can use a number line to model this process
   b. multiplying/dividing with signed numbers is similar to multiplying/dividing with positive numbers, but after you perform the operation, you have to think about the sign of the answer
   c. when you divide by a positive or negative fraction, you can use the inverse relationship between multiplication and division.
5. Decimals are helpful when you want to use a calculator. Percents are common on sale signs. These two representations go back to a fraction.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
Understand Interpret Apply Convert	Chapter 1 Absolute value Opposites Rational numbers

Know Solve Repeating Sum Difference	Integers Chapter 2 Integers Rational numbers Reciprocals Quotient Product

Resources for Vocabulary Development:

Use quality tools (See Adult Learning Framework handbook for ideas)

Big Ideas Chapter 1: Adding and Subtracting Rational Numbers

Standard	Topic & Section	Suggested # of Days	Notes
7.NS.1a	**Chapter Opener** **1.1 Rational Numbers**	**1 block**	
7.NS.1b	**1.2 Adding Integers** ● **Desmos Tool**	**1 block**	
7.NS.1d	**1.3 Adding Rational Numbers**	**2 blocks**	
7.NS.1b	**1.4 Subtracting Integers** ● **Desmos Tool**	**1 block**	
7.NS.1c	**1.5 Subtracting Rational Numbers**	**2 blocks**	
	Connecting Concepts **Review**	**1 block**	
	Chapter 1 Test	**1 block**	

Big Ideas Chapter 2: Multiplying and Dividing Rational Numbers

Standard	Topic & Section	Suggested # of Days	Notes
7.NS.2a	Chapter Opener 2.1 Multiplying Integers • Desmos Tool	1 block	
7.NS.2b	2.2 Dividing Integers	1 block	
7.NS.2b 7.NS.3 7.NS.2d	2.3 Converting Between Fractions and Decimals	1 block	
7.NS.2c	2.4 Multiplying Rational Numbers	2 blocks	
7.NS.2b	2.5 Dividing Rational Numbers • Desmos Tool	2 blocks	
	Connecting Concepts Review	1 block	
	Ch 2 Test	1 block	
	Order of Operations, Emphasis on Exponents Review	2 blocks	Spend two blocks reviewing Order of Operations with students in order to prepare them to work with exponents and negative numbers.

Unit 2: Expressions, Equations, and Inequalities

Subject: Mathematics
Grade: 7th Grade
Name of Unit: Expressions, Equations, and Inequalities
Length of Unit: 18 Blocks (36 days)
Overview of Unit: Students extend their understanding of integers and develop and understanding of expressions. Students will demonstrate this by combining like terms, distributive property, and factoring. Students will then further their knowledge by expanding expressions into equations and inequalities. Students will demonstrate this by solving a variety of equations and inequalities.

Priority Standards for unit:
- MA.7.EEI.B.1: Solve multi-step problems posed with rational numbers.
  a. Convert between equivalent forms of the same number.
  b. Assess the reasonableness of answers using mental computation and estimation strategies.
- MA.7.EEI.B.2: Write and/or solve linear equations and inequalities in one variable.
  a. Write and/or solve equations of the form $x + p = q$ and $px = q$ in which p and q are rational numbers.
  b. Write and/or solve two-step equations of the form $px + q = r$ and $p(x + q) = r$, where p, q and r are rational numbers, and interpret the meaning of the solution in the context of the problem.
  c. Write, solve and/or graph inequalities of the form $px + q > r$ or $px + q < r$, where p, q and r are rational numbers.
  d. 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.
- 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.

- 7.EE.4 Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

  a. 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?

  b. 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. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.

Supporting Standards for unit:
- 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. For example, $a + 0.05a = 1.05a$ means that "increase by 5%" is the same as "multiply by 1.05."

Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
7.EE.3	Multi-step real-life problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically.	Solve	Evaluate	3
7.EE.3	Multi-step mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically.	Solve	Evaluate	3

7.EE.3	Properties of operations to calculate with numbers in any form.	Apply	Apply	2
7.EE.3	Numbers between forms as appropriate.	Convert	Apply	2
7.EE.3	The reasonableness of answers using mental computation	Assess	Analyze	3
7.EE.3	The reasonableness of answer using estimation strategies.	Assess	Analyze	3
7.EE.4a	Word problems leading to equations of the form px + q = r, where p, q, and r are specific rational numbers.	Solve	Evaluate	3
7.EE.4a	Word problems leading to equations of the form p(x + q) = 4, where p, q, and r are specific rational numbers	Solve	Evaluate	3
7.EE.4a	equations of these forms fluently	Solve	Evaluate	3
7.EE.4a	an algebraic solution to an arithmetic solution	Compare	Understand	2
7.EE.4a	the sequence of the operations used in each approach.	Identify	Remember	1
7.EE.4b	word problems leading to inequalities of the form px + q > r or px + q < r, where p, q, and r are specific rational numbers.	Solve	Evaluate	3
7.EE.4b	the solution set of the inequality	Graph	Apply	1
7.EE.4b	the context of the problem	Interpret	Analyze	3

Essential Questions:
1. When is it useful to model a relationship with an expression, equation, and inequality?
2. How does rewriting an expression, equation, and inequality help you think about the relationship in a new way?
3. How can you represent relationships in a world where expressions and equations don't always work?
4. Why is it important to do the same thing to one side of an equation or inequality as you do to the other?

Enduring Understanding/Big Ideas:
1. You can model a relationship with an expression, equation, and inequality if you have two equivalent expressions.
2. You can write simpler equivalent equations and inequalities to eventually solve for the unknown quantity.
3. You can use inequality symbols to represent unequal relationships.
4. To keep the equation or inequality balanced or true.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
Variable Solution Symbol Multiply Graph Equivalent	**Chapter 3:** Expression Linear Distribute Factor Interpret **Chapter 4:** Equations Inequalities Model Two-step equations Two-step inequalities

Resources for Vocabulary Development:
Use a Quality Tool (See Adult Learning Framework handbook)

Big Ideas Chapter 3: Expressions

Standard	Topic & Section	Suggested # of Days	Notes
7.EE.1 7.EE.2	Chapter opener 3.1 Algebraic Expressions	1 block	
7.EE.1 7.EE.2	3.3 Distributive property	2 blocks	
7.EE.1 7.EE.2	3.2 Adding and subtracting linear expression	2 blocks	
7.EE.1 7.EE.2	3.4 Factoring expressions	1 block	
	Connecting concepts Review	1 block	
	Ch 3 Test	1 block	

Big Ideas Chapter 4: Equations and Inequalities

Standard	Topic & Section	Suggested # of Days	Notes
7.EE.4a	**Chapter opener** **4.1 Solving equations using addition or subtraction** **4.2 Solving equations using multiplication or division**	**1 block**	
7.EE.3 7.EE.4a	**4.3 Solving two step equations**	**2 blocks**	
	Review Day and Quiz 4.1-4.3	**1 block**	
7.EE.4b	**4.4 Writing and graphing inequalities**	**2 blocks**	
7.EE.4b	**4.5 Solving inequalities using addition or subtraction**	**1 block**	
7.EE.4b	**4.6 Solving inequalities using multiplication or division**	**1 block**	
7.EE.4b	**4.7 Solving two step inequalities**	**2 blocks**	
	Connecting concepts Review	**1 block**	
	Ch 4 Test	**1 block**	

Unit 3: Ratios/Proportions/Percents

Subject: Mathematics
Grade: 7th Grade
Name of Unit: Ratios/Proportions/Percents
Length of Unit: 19 Blocks (38 days)
Overview of Unit: Students extend their understanding of ratios and develop understanding of proportionality to solve single- and multi-step problems. Students use their understanding of ratios and proportionality to solve a wide variety of percent problems, including those involving discounts, interest, taxes, tips, and percent increase or decrease. Students solve problems about scale drawings by relating corresponding lengths between the objects or by using the fact that relationships of lengths within an object are preserved in similar objects. Students graph proportional relationships and understand the unit rate informally as a measure of the steepness of the related line, called the slope. They distinguish proportional relationships from other relationships.

Priority Standards for unit:

- 7.NS.2 Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.
    - a. 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
    - b. 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.
    - c. Apply properties of operations as strategies to multiply and divide rational numbers.
    - d. Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats.
- 7.NS.3 Solve real-world and mathematical problems involving the four operations with rational numbers.
- 7.RP.2 Recognize and represent proportional relationships between quantities.
    - a. 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.
    - b. Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

c. 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.
d. 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.

Supporting Standards for unit:
● 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.3 Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.
● 7.G.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.

Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
7.NS.2a	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 $(-1)(-1) = 1$	Understand	Understand	1
7.NS.2a	The rules for multiplying signed numbers	Understand	Understand	1
7.NS.2a	Products of rational numbers by describing real-world contexts	Interpret	Evaluate	3
7.NS.2b	That integers can be divided, provided that the divisor is not zero a	Understand	Understand	1
7.NS.2b	Every quotient of integers (with non-zero divisor) is a rational number	Understand	Understand	1
7.NS.2b	If p and q are integers, then $-(p/q) = (-p)/q = p/(-q)$	Understand	Understand	1

7.NS.2b	Quotients of rational numbers by describing real-world contexts.	Interpret	Analyze	3
7.NS.2c	Properties of operations as strategies to multiply rational numbers	Apply	Apply	2
7.NS.2c	Properties of operations as strategies to divide rational numbers	Apply	Apply	2
7.NS.2d	A rational number to a decimal using long division	Convert	Apply	1
7.NS.2d	The decimal form of a rational number terminates in 0s or eventually repeats	Know	Remember	1
7.NS.3	Real-world problems involving the four operations with rational numbers.	Solve	Apply	2
7.NS.3	Mathematical problems involving the four operations with rational numbers	Solve	Apply	2
7.RP.2a	whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table	Decide	Apply	1
7.RP.2a	whether two quantities are in a proportional relationship, e.g., by graphing on a coordinate plane	Decide	Apply	1
7.RP.2a	whether the graph is a straight line through the origin.	Observe	Analyze	1
7.RP.2b	the constant of proportionality (unit rate) in tables of proportional relationships.	Identify	Understand	2
7.RP.2b	the constant of proportionality (unit rate) in graphs of proportional relationships.	Identify	Understand	2
7.RP.2b	the constant of proportionality (unit rate) in equations of proportional relationships.	Identify	Understand	2
7.RP.2b	the constant of proportionality (unit rate) in diagrams of proportional relationships.	Identify	Understand	2
7.RP.2b	the constant of proportionality (unit rate) in verbal descriptions of proportional relationships	Identify	Understand	2
7.RP.2c	proportional relationships by equations.	Represent	Apply	2

	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)			
7.RP.2d	where r is the unit rate.	Explain	Understand	2

Essential Questions:

Enduring Understanding/Big Ideas:

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
Proportional Variable Solution Percent Increase Decrease Period Interest Rate	**Chapter 5:** Proportional Relationship Scale Ratio table Ratios Rates Unit rate Proportions Interpret Constant of proportionality **Chapter 6:** Balance Interest Period Interest Rate Percent Decrease Percent Increase Principle Simple Interest Discounts Markups Percent equation Percent proportion

Resources for Vocabulary Development: Use a Quality Tool (See Adult Learning Framework handbook)

Big Ideas Chapter 5: Ratios and Proportions

Standard	Topic & Section	Suggested # of Days	Notes
7.RP.1 7.RP.2b	Chapter opener 5.1 Ratios and ratio tables 5.2 Rates and unit rates	1 block	Take out tables with fractions and make sure students have a solid understanding of what a ratio is
7.RP.2c	5.4 Writing and solving proportions	2 blocks	
7.RP.2a	5.3 Identifying proportional relationships	2 blocks	
7.RP.2a 7.RP.2d	5.5 Graphs of proportional relationships	1 block	
	Connecting concepts Review	1 block	
	Chapter 5 Test	1 block	

Big Ideas Chapter 6: Percents

Standard	Topic & Section	Suggested # of Days	Notes
7.NS.2b 7.NS.3 7.NS.2d	**Chapter opener** **6.1 Fractions, decimals, and percents**	**1 block**	
7.RP.2b 7.RP.2c	**6.2 The percent proportion** ● **Desmos Tool** **6.3 The percent equation**	**1 block**	
7.RP.3	**6.4 Percent of increase and decrease**	**1 block**	
7.RP.3	**6.5 Discounts and markups**	**1 block**	
7.RP.3	**6.6 Simple interest**	**1 block**	
	Connect concepts Review	**1 block**	
	Ch 6 Test	**1 block**	

Unit 4: Probability and Statistics

Subject: Mathematics
Grade: 7th Grade
Name of Unit: Probability and Statistics
Length of Unit: 12 Blocks (24 days)
Overview of Unit: Students build on their previous work with single data distributions to compare two data distributions and address questions about differences between populations. They begin informal work with random sampling to generate data sets and learn about the importance of representative samples for drawing inferences. Students will use models to compare theoretical to experimental probability. Students will collect data through the process of random sampling to describe populations and draw valid conclusions.

Priority Standards for unit:
- 7.SP.4 Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.
- 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.8 Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.

  a. 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.
  b. 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.
  c. Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?

Supporting Standards for unit:
- 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
- 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.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

  a. 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.

  b. 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?

Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
7.SP.4	measures of center for numerical data from random samples to draw informal comparative inferences about two populations.	Use	Apply	3
7.SP.4	measures of variability for numerical data from random samples to draw informal comparative inferences about two populations.	Use	Apply	3
7.SP.6	the probability of a chance event by collecting data on the chance process that produces it	Approximate	Analyze	3
7.SP.6	long-run relative frequency	Observe	Understand	2
7.SP.6	the approximate relative frequency given the probability	Predict	Create	2
7.SP.8a	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.	Understand	Understand	1
7.SP.8b	sample spaces for compound events using methods such as organized lists	Represent	Analyze	1
7.SP.8b	sample spaces for compound events using methods such as tables.	Represent	Analyze	1
7.SP.8b	sample spaces for compound events using methods such as tree diagrams.	Represent	Analyze	1
7.SP.8b	the outcomes in the sample space which compose the event, such as an event described in everyday language (e.g., "rolling double sixes").	Identify	Understand	2
7.SP.8c	a simulation to generate frequencies for compound events.	Design	Create	3
7.SP.8c	a simulation to generate frequencies for compound events.	Use	Evaluate	3

Essential Questions:
1. How can you make conclusions about the entire group without checking every member of the group?
2. How can you draw conclusions about the groups without checking every member of each group?
3. How do you measure the probability of an event?
4. Can you use probability to predict future events?
5. How do you measure the probability of more than one event?
6. How can statistics be used in sports or the business world?
7. How can a bias sample affect a statistic?

Enduring Understanding/Big Ideas:
1. You can use different types of sampling; such as convenience sampling, systematic sampling, and simple random sampling to predict quantities about the entire group.
2. You can use measures of center; such as mean, median, mode, range, and interquartile range.
3. You can use words such as unlikely and certain, or a number between 0 and 1 to represent the probability that an event will occur.
4. You can perform trials and collect data to find experimental probability. You can reason about all of the possible outcomes of an event and find theoretical probability.
5. A compound event is an event associated with a multi-step action. You can find the number of outcomes of a multi-step process by finding the product of the number of possible outcomes of each step of the process.
6. Statistics can be used in sports to show quantitative values of your performance so you can compare to other groups. Statistics can be used in business to evaluate sales, performance, or product outcomes.
7. It can skew the data so it is not representative of the population.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
Average Range Compare Inference Deviation Probability Theoretical Trial Frequency Dependent Independent Experiment	**Chapter 7:** Mean Comparative Inference Mean absolute deviation Outcomes Event Relative frequency Experimental probability Theoretical probability Sample space Fundamental counting principle Compound event Simulation **Chapter 8:** Population Sample Unbiased sample Bias sample Sample space Median Interquartile range Mean Skew Conclude Variation Measures of Center

Resources for Vocabulary Development: Use quality tools (See Adult Learning Framework)

Big Ideas Chapter 7: Probability

Standard	Topic & Section	Suggested # of Days	Notes
7.SP.5 7.SP.6	Chapter opener 7.1 Probability	1 block	
7.SP.6 7.SP.7a 7.SP.7b	7.2 Experimental and Theoretical probability	1 block	
7.SP.8b 7.SP.8a	7.3 Compound events	1 block	
	Connecting concepts Review	1 block	
	Ch 7 Test	1 block	

Big Ideas Chapter 8: Statistics

Standard	Topic & Section	Suggested # of Days	Notes
7.SP.1	**Chapter opener** **8.1 Samples and populations**	**1 block**	
7.SP.1 7.SP.2	**8.2 Using random samples to describe populations**	**1 block**	
	Connecting concepts **Review**	**1 block**	
	Ch 8 Test	**1 block**	

Unit 5: Geometric Shapes and Angles

Subject: Mathematics
Grade: 7th Grade
Name of Unit: Geometric Shapes and Angles
Length of Unit: 7 Blocks (14 days)
Overview of Unit: Students continue their work with area from Grade 6, solving problems involving the area and circumference of a circle. In preparation for work on congruence and similarity in Grade 8 they reason about relationships among two-dimensional figures using informal geometric constructions, and they gain familiarity with the relationships between angles formed by intersecting lines. Students will solve real-world and mathematical problems involving area two-dimensional objects composed of triangles, quadrilaterals, and polygons. Students will solve unknown angle measurements.

Priority Standards for unit:

- 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.

Supporting Standards for unit:

- 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.

Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
7.G.4	the formula for the area of a circle	Know	Remember	1
7.G.4	the formula for the circumference of a circle	Know	Remember	1
7.G.4	the formula for the area of a circle to solve problems	Use	Apply	1
7.G.4	the formulas for circumference of a circle to solve problems	Use	Apply	1
7.G.4	an informal derivation of the relationship	Give	Understand	3

	between the circumference and area of a circle			

Essential Questions:

1. How can you define a circle?
2. What does it mean to talk about the size of a circle?
3. Are some measurements more useful in certain situations than others?
4. How can you differentiate between radius and diameter?
5. How can you differentiate between circumference and area?
6. How can you find the area of a composite figure?

Enduring Understanding/Big Ideas:

1. The set of points in a plane that are the same distance from another point define a circle.
2. The radius, diameter, circumference, and area of a circle are related; you can use them to talk about the size of a circle.
3. Yes depending on what the situation calls for; space occupied by objects or space within an object. The formula will determine what measurement to apply.
4. Radius is half way across the circle and diameter is all the way across the circle, both have to be through the center point.
5. The circumference the distance around a circle and the area is the space inside.
6. Break it into basic shapes like triangles, squares, rectangles, and semicircles. You then find their individual areas and add them together.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
Angle Circle Circumference Area of a circle Know Use Solve Adjacent	**Chapter 9** Acute angle Adjacent Angles Angle Complementary Angles Obtuse angle Right angle Straight angle Supplementary Angles Vertex of an Angle Vertical Angles Composite figure Pi Radius

	Diameter
	Center
	Cross section
	Construct
	Quadrilateral

Resources for Vocabulary Development: Use quality tools (See Adult Learning Framework handbook)

Big Ideas Chapter 9: Geometric Shapes and Angles

Standard	Topic & Section	Suggested # of Days	Notes
7.G.2 7.G.4	**Chapter opener** **9.1 Circles and circumference**	**1 block**	
7.G.2 7.G.4	**9.2 Areas of circles**	**1 block**	
7.G.2 7.G.4	**9.3 Perimeters and areas of composite figures**	**1 block**	Omit teaching grids and only focus on composite figures.
7.G.5 7.G.2	**9.5 Finding unknown angle measures** **• Desmos Tool**	**1 block**	
	Connecting concepts Review	**1 block**	
	Ch 9 Test	**1 block**	

Unit 6: Surface Area and Volume

Subject: Mathematics
Grade: 7th Grade
Name of Unit: Surface Area and Volume
Length of Unit: 9 Blocks (18 days)
Overview of Unit: Students will extend their prior knowledge of surface area and volume to include triangular prisms, cylinders, and pyramids. Students will understand and apply various formulas to calculate surface areas and volumes of solids. Students will apply this knowledge to real life situations and scenarios. Students will describe various cross sections of three dimensional figures.

Priority Standards for unit:

- 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.

Supporting Standards for unit:

- 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.

Standard	Unwrapped Concepts (Students need to know)	Unwrapped Skills (Students need to be able to do)	Bloom's Taxonomy Levels	Webb's DOK
7.G.6	**Real-world** problems involving **area** of two-dimensional objects composed of **triangles**.	Solve	Apply	1
7.G.6	**Mathematical** problems involving **area** of two-dimensional objects composed of **triangles**.	Solve	Apply	1
7.G.6	**Real-world** problems involving **area** of two-dimensional objects composed of **quadrilaterals**.	Solve	Apply	1
7.G.6	**Mathematical** problems involving **area** of two-	Solve	Apply	1

	dimensional objects composed of **quadrilaterals**.			
7.G.6	**Real-world** problems involving **area** of two-dimensional objects composed of **polygons**.	Solve	Apply	1
7.G.6	**Mathematical** problems involving **area** of two-dimensional objects composed of **polygons**.	Solve	Apply	1
7.G.6	**Real-world** problems involving **volume** of three-dimensional objects composed of **cubes**.	Solve	Apply	1
7.G.6	**Mathematical** problems involving **volume** of three-dimensional objects composed of **cubes**.	Solve	Apply	1
7.G.6	**Real-world** problems involving **surface area** of three-dimensional objects composed of **cubes**.	Solve	Apply	1
7.G.6	**Mathematical** problems involving **surface area** of three-dimensional objects composed of **cubes**.	Solve	Apply	1
7.G.6	**Real-world** problems involving **volume** of three-dimensional objects composed of **right prisms**.	Solve	Apply	1
7.G.6	**Mathematical** problems involving **volume** of three-dimensional objects composed of **right prisms**.	Solve	Apply	1
7.G.6	**Real-world** problems involving **surface area** of three-dimensional	Solve	Apply	1

	objects composed of **right prisms**.			
7.G.6	**Mathematical** problems involving **surface area** of three-dimensional objects composed of **right prisms**.	Solve	Apply	1

Essential Questions:
1. In what ways can you measure a three-dimensional figure?
2. Are some measurements more useful in certain situations than others?
3. How do you find the surface area of a rectangular prism or a pyramid?
4. How do you find the surface area of a cylinder?
5. How do you find the volume of a prism or cylinder?
6. How do you find the volume of the pyramid?
7. How do you define a cross section of a three dimensional object?

Enduring Understanding/Big Ideas:
1. You can measure a three-dimensional figure by its volume and/or surface area.
2. Yes depending on what the situation calls for; space occupied by objects or space within an object.
3. It is the sum of the bases and the lateral faces.
4. It is the sum of the areas of the bases and the lateral surface.
5. It is the area of the base shape times the height of the object.
6. It is the area of the base shape times the height of the pyramid then multiplied by one third.
7. It is a two dimensional shape that is the intersection of the plane and the solid.

Unit Vocabulary:

Academic Cross-Curricular Words	Content/Domain Specific
Circumference of a circle Area of a circle Know Use Solve	**Chapter 10** Height of a Prism Lateral Face Lateral Area of a Prism Surface Area of a Cube Surface Area of a Prism Volume of a Cube Volume of a Prism

	Cross section 3-Dimensional figures Base Slant height

Resources for Vocabulary Development: Use quality tools (See Adult Learning Framework handbook)

Big Ideas Chapter 10: Surface Area and Volume

Standard	Topic & Section	Suggested # of Days	Notes
7.G.6	**Chapter opener** **10.1 Surface areas of prisms**	**2 block**	
7.G.6	**10.2 Surface areas of cylinders** ● **Desmos Tool**	**1 block**	
7.G.6	**10.3 Surface areas of pyramids** ● **Desmos Tool**	**1 block**	
7.G.6	**10.4 Volumes of prisms** ● **Desmos Tool**	**1 block**	
7.G.6	**10.5 Volumes of pyramids**	**1 block**	
7.G.3	**10.6 Cross sections of three-dimensional figures**	**1 block**	
	Connecting concepts **Review**	**1 block**	
	Ch 10 Test	**1 block**	

Unit of Study Terminology

Appendices: All Appendices and supporting material can be found in this course's shell course in the District's Learning Management System.

Assessment Leveling Guide: A tool to use when writing assessments in order to maintain the appropriate level of rigor that matches the standard.

Big Ideas/Enduring Understandings: Foundational understandings teachers want students to be able to discover and state in their own words by the end of the unit of study. These are answers to the essential questions.

Engaging Experience: Each topic is broken into a list of engaging experiences for students. These experiences are aligned to priority and supporting standards, thus stating what students should be able to do. An example of an engaging experience is provided in the description, but a teacher has the autonomy to substitute one of their own that aligns to the level of rigor stated in the standards.

Engaging Scenario: This is a culminating activity in which students are given a role, situation, challenge, audience, and a product or performance is specified. Each unit contains an example of an engaging scenario, but a teacher has the ability to substitute with the same intent in mind.

Essential Questions: Engaging, open-ended questions that teachers can use to engage students in the learning.

Priority Standards: What every student should know and be able to do. These were chosen because of their necessity for success in the next course, the state assessment, and life.

Supporting Standards: Additional standards that support the learning within the unit.

Topic: These are the main teaching points for the unit. Units can have anywhere from one topic to many, depending on the depth of the unit.

Unit of Study: Series of learning experiences/related assessments based on designated priority standards and related supporting standards.

Unit Vocabulary: Words students will encounter within the unit that are essential to understanding. Academic Cross-Curricular words (also called Tier 2 words) are those that can be found in multiple content areas, not just this one. Content/Domain Specific vocabulary words are those found specifically within the content.