



Park Hill School District

Building Successful Futures • Each Student • Every Day

6th Grade SPED Resource Mathematics Curriculum

Course Description: In 6th Grade Math, students build foundational understanding across five critical areas while applying mathematics to real-world situations:

- (1) developing fluency with fractions, decimals, and multi-digit operations to strengthen number sense and problem solving;
- (2) understanding ratios and unit rates to compare quantities and solve problems involving percents and measurement;
- (3) building algebraic thinking through writing and evaluating expressions and solving one-step equations and inequalities;
- (4) analyzing statistical questions by representing and interpreting data using measures of center and variability; and
- (5) exploring geometry and measurement by finding area, surface area, and volume, and graphing points and shapes in the coordinate plane.

Throughout the course, students use multiple representations, reason mathematically, and apply problem-solving strategies in both abstract and real-world contexts.

Curriculum Standards: Missouri Department of Elementary and Secondary Education (DESE)

**This document contains the entire 6th Grade Mathematics curriculum that is taught in a general education setting. Items that are highlighted in yellow have been designated as priority information that should be taught in the 6th Grade SPED Mathematics course. Accommodations and Modifications that are recommended to consider have been noted in red text.*

Scope and Sequence:

Timeframe	Unit	Instructional Topics
21 blocks	<u>Unit 1: Number Sense & Operations</u>	<u>Topic 1: Numerical Expressions & Factors</u> <u>Topic 2: Fractions & Decimals</u> <u>Topic 3: Percents</u>
11 blocks	<u>Unit 2: Ratios & Proportional Relationships</u>	<u>Topic 1: Ratios & Rates</u>
24 blocks	<u>Unit 3: Expressions, Equations, & Inequalities</u>	<u>Topic 1: Algebraic Expressions & Properties</u> <u>Topic 2: Equations</u> <u>Topic 3: Integers, Number Lines, & the Coordinate Plane: <i>Inequalities</i></u>
24 blocks	<u>Unit 4: Data, Statistics, Probability, Geometry, & Measurement</u>	<u>Topic 1: Integers, Number Lines, and the Coordinate Plane: <i>Integers & the Coordinate Plane</i></u> <u>Topic 2: Statistical Measures</u> <u>Topic 3: Data Displays</u> <u>Topic 4: Area, Surface Area, & Volume</u>

Unit 1: Number Sense & Operations

Subject: Mathematics

Grade: 6th Grade

Name of Unit: Number Sense & Operations

Length of Unit: 21 Blocks

Overview of Unit: Students develop fluency with multi-digit whole numbers, fractions, and decimals while deepening their understanding of how these number forms are related. They focus on operations to solve real-world problems (word problems) using models, equations, and estimation strategies. Emphasis is placed on selecting appropriate methods and justifying solutions. Students build efficiency and accuracy while maintaining conceptual understanding, with a focus on conceptualization rather than calculation. This unit strengthens number sense as a foundation for all future mathematics. **Prerequisite skills include: Order of Operations, and Fraction Review (what fractions are, how they look as a decimal)**

Priority Standards for unit:

- 6.EE.A.2.d Create and evaluate expressions involving variables and whole number exponents. Write and evaluate algebraic expressions.
- 6.EE.A.2.e Create and evaluate expressions involving variables and whole number exponents. Understand the meaning of the variable in the context of the situation.
- 6.NS.A.1.a Compute and interpret quotients of positive fractions. Solve problems involving division of fractions by fractions
- 6.RP.A.3.c Solve problems involving ratios and rates. Solve percent problems.

Supporting Standards for unit:

- 6.EE.A.2.a Create and evaluate expressions involving variables and whole number exponents. Identify parts of an expression using mathematical terminology.
- 6.NS.B.2 Demonstrate fluency with division of multi-digit whole numbers.
- 6.NS.B.3 Demonstrate fluency with addition, subtraction, multiplication and division of decimals.
- 6.NS.B.4.a Find common factors and multiples. Find the greatest common factor (GCF) and the least common multiple (LCM).
- 6.NS.C.6.b Locate a rational number as a point on the number line. Write, interpret and explain problems of ordering of rational numbers.
- 6.NS.C.8 Extend prior knowledge to generate equivalent representations of rational numbers between fractions, decimals and percentages (limited to terminating decimals and/or benchmark fractions of $\frac{1}{3}$ and $\frac{2}{3}$).

Essential Questions:

1. How can the meaning of addition, subtraction, multiplication, and division be extended from whole numbers to decimals?
2. How can you extend the use of place value with whole number operations to decimal operations?

3. How do we choose the best operation to solve a problem involving whole numbers, fractions, and /or decimals?
4. What is the relationship between fractions, decimals, whole numbers, and percentages?
5. When is an estimate more useful than an exact answer?
6. How can models help us understand and solve numerical problems?
7. How do models help us make sense of real-world situations?

Enduring Understanding/Big Ideas:

1. Operations (addition, subtraction, multiplication and division) have consistent meanings that apply to calculations with whole numbers and decimals.
2. Extending place value from whole numbers to decimal operations transforms decimal arithmetic from an algorithm (just move the decimal point right or left) into a logical, understandable extension of the base-ten system
3. Choosing the best operation (addition, subtraction, multiplication, or division) for problems involving whole numbers, fractions, and decimals requires moving students beyond just looking for "keyword clues" to understanding the conceptual action happening within a word problem.
4. Quantities can be represented in multiple forms (fractions, decimals, percentages and whole numbers) and these forms are related/interconnected. **This concept is very important to ensure that students in Resource or Co-Taught settings develop an adequate understanding of.**
5. Estimation is a useful tool for judging the reasonableness of solutions.
6. Mathematical models (visuals, equations, diagrams, manipulatives) help us understand and solve problems.
7. Fluency and accuracy of conversions between fractions, decimals and percentages support efficient problem solving in real-world contexts.

Unit 1 Engaging Scenario

Engaging Scenario: 1 block

(An Engaging Scenario is a culminating activity that includes the following components: situation, challenge, specific roles, audience, product or performance.)

In this scenario comprised of three tasks, students apply their understanding of fractions and integers to real-world contexts involving [measurement](#), [gaming](#), and [temperature](#) data. They use models and equations to explore division of fractions through tasks such as determining how many fractional groups can be made and calculating playtime from fractional video game credits. Students also analyze and represent integer data by ordering and comparing temperatures and creating graphs or other mathematical representations to support their conclusions. Throughout the scenario, students justify their reasoning and make connections between mathematical concepts and real-world situations.

[Cups of Rice](#) (Quotients of Fraction)

[Video Game Credits](#) (Quotients of Fractions)

[Temperatures](#) (Ordering Integers)

Engaging Scenarios may be used as part of the block period allotted for Unit Assessments.

Modified Engaging Scenario –

Quotients of Fractions

Task 1: The Snack Station (Fractions as Fair Sharing)

Students will explore "how many fit" by using physical manipulatives (like fraction tiles or measuring cups).

Activity: Instead of abstractly dividing fractions, students use a "scoop" method to see how many $\frac{1}{2}$ or $\frac{1}{4}$ cups of rice or snacks are needed to fill a container.

Goal: Understand that a whole can be broken into smaller, equal pieces.

Cups of Rice Activity

Focus on concrete visuals, simplified language, and scaffolding. Instead of abstract "fractions of a container," we should use relatable amounts like "half" or "pieces."

Part A: How many containers can we fill? You have 1 full cup of water. You have small plastic containers. It takes only $\frac{1}{4}$ cup (one small scoop) to fill 1 container.

1. Draw a Picture—Draw your 1 full cup of water. Use a different color to circle every $\frac{1}{4}$ portion/part. How many circles did you make?
2. Choose the Math Sentence—Which math sentence matches your picture? Circle one:
 $1 \div \frac{1}{4}$ (I am splitting 1 cup into groups of $\frac{1}{4}$)
 $1 \times \frac{1}{4}$ (I am taking a small part of 1 cup)

Why? I chose this because _____.

3. Solve It—Solve the math sentence you circled. (Hint: How many $\frac{1}{4}$ pieces fit into 1 whole?)(

Part B: How much fits in the whole container? You pour $\frac{1}{2}$ cup of water into a big container. The water only fills up $\frac{1}{3}$ (one out of three parts) of that container.

1. Draw a Picture—Draw a tall rectangle to be the container. Divide it into 3 equal floors. Color the bottom floor and label it " $\frac{1}{2}$ cup." If every floor holds the same amount, how much water is in the whole container?

2. Choose the Math Sentence—Which math sentence helps you find the total amount the container holds?

$$\frac{1}{2} \div \frac{1}{3}$$

$$\frac{1}{2} \times 3$$

Why? I chose this because _____.

3. Solve It—Count up your "floors" from your picture or solve the math sentence. Total Cups: _____

Teacher's Modification Strategy:

Reduced Complexity: Change the fractions to more "friendly" numbers ($\frac{1}{4}$, $\frac{1}{2}$, $\frac{1}{3}$) to help students visualize the parts without getting stuck on the computation.

Visual Anchors: The "floors" analogy for the container helps students understand that a full container is made of equal units.

Topic 1: Numerical Expressions & Factors

<u>Cross-Cutting Terms:</u>		Grade-Specific Terms	
evaluate exponent power		base (of a power) common factors common multiples factor pair	greatest common factor (GCF) least common multiple (LCM) numerical expression order of operations (PEMDAS) perfect square prime numbers/factors
Priority Standards & Supporting Standards	Learning Targets	Success Criteria	Aligned Sections from Course Resource
6.EE1.A.2.d, 6.EE1.A.2.e <i>6.EE1.A.2.a</i>	The student will write and evaluate expressions involving exponents.	● I can write products of repeated factors as powers. ● I can evaluate powers. ● I know the base of a power is the repeated factor.	1.1 Powers and Exponents
6.EE1.A.2.e <i>6.EE1.A.2.a</i>	The student will write and evaluate numerical expressions using the order of operations.	● I can explain why there is a need for a standard order of operations. ● I can evaluate numerical expressions involving several operations, exponents, and grouping symbols. ● I can write numerical expressions involving exponents to represent a real world problem.	1.2 Order of Operations
<i>6.NS.B.4.a</i>	The student will find the greatest common factor of at least two numbers.	● I can explain the meaning of factors of a number. ● I can explain the meaning of factors of a number. ● I can use lists of factors to identify the greatest common factor of	1.4 Greatest Common Factor

		numbers. ● I can use prime factors to identify the greatest common factor of numbers.	
6.NS.B.4.a	The student will find the least common multiple of at least two numbers.	● I can explain the meaning of multiples of a number. ● I can use lists of multiples to identify the least common multiple of numbers. ● I can use prime factors to identify the least common multiple of numbers.	1.5 Least Common Multiple

Engaging Experience 1

Title: The Florist Shop		Blocks: ½
Learning Target(s): The student will find the greatest common factor of at least two numbers.	Success Criteria: - I can explain the meaning of factors of a number. - I can explain the meaning of factors of a number. - I can use lists of factors to identify the greatest common factor of a number. - I can find the greatest common factor of a number using prime factorization.	
Rich Task: The florist can order roses in bunches of one dozen and lilies in bunches of 8. Last month she ordered the same number of roses as lilies. If she ordered no more than 100 roses, how many bunches of each could she have ordered? What is the smallest number of bunches of each that she could have ordered? Explain your reasoning.	Instructional Suggestions: - Encourage students to make sense of the constraints (equal totals, bunch sizes, and maximum limit) by organizing their thinking with tables, equations, or lists. - Prompt students to explore and compare strategies such as using common multiples, trial and revise, or equations to find solutions. - Use purposeful questions to push students to justify how their solution meets all conditions and how they determined the smallest possible combination. - Facilitate discussion where students explain and critique different approaches, highlighting connections between multiples and real-world contexts.	
<u>Student Math Practices:</u>		

Resources:

- [‘The Florist Shop’ from Illustrative Math](#)

Modified Version:

Break the problem up into smaller parts, making the language more clear and understandable.

For example: A florist buys:

Roses in groups of **12**

Lilies in groups of **8**

She bought the **same number of roses and lilies**. She bought **100 or fewer roses**.

Rephrase the task by finding ways the florist can buy the **same number of roses and lilies**.

Make sure the number of roses is **100 or less**.

Find the **smallest number of bunches** she could buy.

Provide a visual: (table)

Bunches of Roses	Total Roses (x12)	Bunches of Lilies	Total Lilies (x8)
1	12		
2	24		
3	36		
4	48		
5	60		
6	72		
7	84		
8	96		

Students then find matching numbers in the lilies column (counting by 8s: 8, 16, 24, 32, 40, 48, 56, 64, 72, 80, 88, 96...)

Provide guided questions to chunk thinking:

What are the total roses for each row?

Count by 8s—when do you get the same number?

Circle the matches (example: 24, 48, 72, 96)

Which numbers are **100 or less**?

Identify solutions together to model observations like:

24 roses = 3 bunches of roses and 3 bunches of lilies

48 roses = 4 bunches of roses and 6 bunches of lilies

72 roses = 6 bunches of roses and 9 bunches of lilies

96 roses = 8 bunches of roses and 12 bunches of lilies

Ask: “Which is the smallest number of roses that works?” so students identify that **24 roses** is the smallest match, so

2 bunches of roses (24 roses)

3 bunches of lilies (24 lilies)

Provide students with a sentence frame to complete the answer:

“The smallest number is ____ because it is the first number that both 12 and 8 can make.”

“The florist could buy ____ bunches of roses and ____ bunches of lilies.”

Other supports to consider:

Use color-coding (multiples of 12 vs. 8)

Provide a number line counting by 8s and 12s

Provide multiplication chart and model how to find the answer

Topic 2: Fractions & Decimals

<u>Cross-Cutting Terms:</u>		Grade-Specific Terms	
None		multiplicative inverses reciprocals improper fraction mixed number numerator denominator	
Priority Standards & Supporting Standards	Learning Targets	Success Criteria	Aligned Sections from Course Resource
	The student will find products involving fractions and mixed numbers.	● I can draw a model to explain fraction multiplication. ● I can multiply fractions. ● I can find products involving mixed numbers. ● I can interpret products involving fractions and mixed numbers to solve real-life problems.	2.1 Multiplying Fractions
6.NS.A.1.a	The student will compute quotients of fractions and solve problems involving division by fractions.	● I can draw a model to explain division of fractions. ● I can find reciprocals of numbers. ● I can divide fractions by fractions. ● I can divide fractions and whole numbers. ● I can simplify fractions to lowest terms.	2.2 Dividing Fractions
6.NS.A.1.a	The student will compute quotients of fractions and solve problems involving division by fractions.	● I can draw a model to explain division of mixed numbers. ● I can write a mixed number as an improper fraction.	2.3 Dividing Mixed Numbers

		● I can divide with mixed numbers. ● I can evaluate expressions involving mixed numbers using the order of operations. ● I can simplify fractions to lowest terms.	
6.NS.C.6.b	The student will convert decimals to fractions and fractions to decimals.	● I can change a decimal to a fraction. ● I can change a fraction to a decimal	N/A
6.NS.B.3	The student will add and subtract decimals and solve problems involving addition and subtraction of decimals. The student will decontextualize and contextualize problems and solutions to explain their reasoning involving addition and subtraction of decimals.	● I can explain why it is necessary to line up the decimal points when adding and subtracting decimals. ● I can add decimals. ● I can subtract decimals. ● I can justify my reasoning when adding and subtracting decimals within context.	2.4 Adding and Subtracting Decimals
6.NS.B.3	The student will multiply decimals and solve problems involving multiplication of decimals. The student will decontextualize and contextualize problems and solutions to explain their reasoning involving multiplying and dividing of decimals.	● I can multiply decimals by whole numbers. ● I can multiply decimals by decimals. ● I can evaluate expressions involving multiplication of decimals. ● I can justify my reasoning when multiplying and dividing decimals within context.	2.5 Multiplying Decimals
6.NS.B.2 6.NS.B.3	The student will divide whole numbers and solve problems involving division of whole numbers. The student will	● I can use long division to divide whole numbers. ● I can write a number as a fraction. ● I can interpret quotients in real-life problems.	2.6 Dividing Whole Numbers

	decontextualize and contextualize problems and solutions to explain their reasoning involving division of whole numbers.	● I can justify my reasoning when dividing whole numbers.	
6.NS.B.2 6.NS.B.3	The student will divide decimals and solve problems involving division of decimals. The student will decontextualize and contextualize problems and solutions to explain their reasoning involving division of decimals.	● I can divide decimals by whole numbers. ● I can divide decimals by decimals. ● I can divide whole numbers by decimals. ● I can justify my reasoning when dividing whole numbers.	2.7 Dividing Decimals

Engaging Experience 2

Title: Traffic Jam		Blocks: ½
Learning Target(s): ● The student will compute quotients of fractions and solve problems involving division by fractions.	Success Criteria: ● I can draw a model to explain division of mixed numbers. ● I can write a mixed number as an improper fraction. ● I can divide with mixed numbers. ● I can evaluate expressions involving mixed numbers using the order of operations.	
Rich Task: ● Students will solve the following scenario: You are stuck in a big traffic jam on the freeway and you are wondering how long it will take to get to the next exit, which is 1 ½ miles away. You are timing your progress and find that you can travel ⅔ of a mile in one hour. If you continue to make progress at this rate, how long will it be until you reach the exit? Solve the problem with a diagram and explain your answer.	Instructional Suggestions: ● Break students into appropriate groups to solve the scenario. ● Encourage students to represent the situation with a diagram (e.g., number line or tape diagram) to make sense of the rate and distance. ● Prompt students to connect division of fractions to the context by explaining what the quotient represents. ● Use purposeful questions to help students justify how their model supports their solution. ● Facilitate discussion comparing different visual models and solution strategies.	

Student Math Practices:

●MP1 ●MP2 ●MP3 ●MP4 ●MP5 ●MP6 ●MP7 ●MP8

Resources:

- [‘Traffic Jam’ from Illustrative Math](#)

Modified Version:

Review mixed numbers and conversion to and from improper fractions. Create a visual/anchor chart for math notebooks to refer to.

Resources:

IXL: [Fraction Fling](#) (matching mixed numbers with models) IXL and ABCYa

Topic 3: Percents

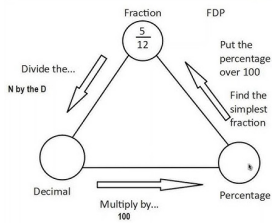
<u>Cross-Cutting Terms:</u>		Grade-Specific Terms	
None		percent	
Priority Standards & Supporting Standards	Learning Targets	Success Criteria	Aligned Sections from Course Resource
6.RP.A.3.c 6.NS.C.8	The student will write percentages as fractions and fractions as percentages.	- I can interpret models to represent decimals. - I can write percentages as fractions. - I can write equivalent fractions with denominators of 100. - I can write fractions as percentages.	4.1 Percents & Fractions
6.RP.A.3.c 6.NS.C.8	The student will write percentages as decimals and decimals as percentages.	- I can interpret models to represent decimals. - I can explain why the decimal point moves when multiplying and dividing by 100. - I can move the decimal point when multiplying and dividing by 100. - I can write percentages as decimals. - I can write decimals as percentages.	4.2 Percents & Decimals
6.NS.C.8	The student will compare and order fractions, decimals, and percents.	- I can rewrite a group of fractions, decimals, and percents using the same representation. - I can explain how to compare fractions, decimals, and percents. - I can order fractions, decimals, and percents from least to greatest or greatest to least.	4.3 Comparing & Ordering Fractions, Decimals, and Percents

6.RP.A.1 6.RP.A.3.c	The student will find a percent of a quantity and solve percent problems.	- I can represent percentages using an equation, a ratio table, or a model. - I can find the percentages of numbers. - I can find missing parts in percentage problems.	4.4 Solving Percent Problems
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Engaging Experience 3

Title: Continuum of Equivalence with Decimals, Fractions, & Percents		Blocks: ¼
Learning Target(s): The student will compare and order fractions, decimals, and percents.	Success Criteria: - I can rewrite a group of fractions, decimals, and percents using the same representation. - I can explain how to compare fractions, decimals, and percents. - I can order fractions, decimals, and percents from least to greatest or greatest to least.	
Rich Task: - Students will create a “recycling arrows” type circle to visually illustrate the connections between percents, decimals, and fractions. - The goal is to help students building neural connections to understand that if they are given a value in any of the three formats (percents, decimals, & fractions), they can easily find the other two options by moving around the circle	Instructional Suggestions: - Consider providing guided notes so that students can fill in their circle for future reference. - Have students explicitly connect each representation (fraction, decimal, percent) and explain how to move between them. - Encourage use of multiple examples to reinforce patterns and build fluency. - Ask students to justify why their conversions are equivalent across all forms. - Use student-created visuals to anchor discussion and deepen conceptual understanding.	
Student Math Practices: ●MP1 ●MP2 ●MP3 ●MP4 ●MP5 ●MP6 ●MP7 ●MP8		
Resources:		

Example of Arrow Chart



Modified Version:

Provide a pre-made version. A circle divided into 3 labeled sections: *Fraction*, *Decimal*, *Percent*. Leave blanks for students to fill in.

Start with familiar ideas like numbers that students have likely heard before:

$$1/2 = 0.5 = 50\%$$

$$1/4 = 0.25 = 25\%$$

$$3/4 = 0.75 = 75\%$$

$$1/10 = 0.1 = 10\%$$

Teacher Model (I do):

Fill in one full circle: Fraction: $\frac{1}{2}$, Decimal: 0.5, Percent: 50%

Explain: “Percent means out of 100” and “Decimal is another way to write the same number.”

Add arrows and provide clear movement rules on the circle:

Decimal → Percent: move decimal 2 places right

Percent → Decimal: move decimal 2 places left

Fraction → Decimal: divide top ÷ bottom (or use known facts)

Guided Practice (We do)

Fill in a second example together: Fraction: $\frac{1}{4}$

Ask: “What is $1 \div 4$?” → 0.25 and “How do we turn 0.25 into a percent?” → 25%

Students fill in their circle with support.

Independent Practice (You Do)

Give students 2–3 circles maximum. Example circles: $\frac{3}{4}$, $\frac{1}{10}$, $\frac{1}{5}$ (optional challenge)

Provide sentence frames:

“The fraction ____ is equal to the decimal ____ and the percent ____.”

“I changed the decimal to a percent by ____.”

Other supports to consider:

Provide students with conversion chart.

Engaging Experience 4

Title: Parking Lot Percents

Blocks: $\frac{1}{2}$

Learning Target(s): The student will find a percent of a quantity and solve percent problems.	Success Criteria: - I can represent percentages using an equation, a ratio table, or a model. - I can find percentages of numbers. - I can solve for the missing value in a percentage problem (part, whole, or percent).
Rich Task: Given a fixed number of 2-wheel and 4-wheeled vehicles in a hypothetical parking lot, students will determine how many total wheels are in the parking lot based on a given percentage of vehicles of one type. Show the <i>Parking Lot Percentages</i> slide and have students solve for the number of total wheels in the parking lot	Instructional Suggestions: - Encourage students to define the whole and identify what the given percent represents before solving. - Prompt students to use equations or organized representations to determine totals. - Ask students to justify how their calculations connect to the context of wheels and vehicles. - Facilitate comparison of strategies to highlight efficient reasoning.
<u>Student Math Practices:</u> ●MP1 ●MP2 ●MP3 ●MP4 ●MP5 ●MP6 ●MP7 ●MP8	
Resources: <i>Parking Lot Percentages</i> slide	
Modified Version: Simplify the rich task— There are 10 vehicles in a parking lot. Some are cars (4 wheels) and some are motorcycles (2 wheels). 50% of the vehicles are cars. How many total wheels are in the parking lot? Ask: “What is the total number of vehicles?” → 10 “This is our WHOLE.” (whole means T O T A L) Have students circle or underline the total. Find the percent. Start with 50%, 25%, or 10% only. Example: 50% of 10 = 5 cars Provide support: 50% = half, use counters or draw 10 boxes and shade 5 Find the other group:, Total = 10 vehicles, Cars = 5, Motorcycles = 5 Provide a visual support (example: table)	

Vehicle Type	Number of Vehicles	Wheels Each	Total Wheels
Cars	5	4	20
Motorcycles	5	2	10

Add total wheels: $20 + 10 = 30$ wheels

Summary of Unit 1 Engaging Learning Experiences			
Topic	Section	Experiences	Suggested Length of Time
1: Numerical Expressions & Factors	Powers and Exponents	Big Ideas: Chapter 1, Lesson 1 (1.1)	½ block
	Order of Operations	Big Ideas: Chapter 1, Lesson 2 (1.2)	1 block
	Greatest Common Factor	Big Ideas: - Chapter 1, Lesson 4 (1.4) Engaging Experiences: 1: The Florist Shop (modified version provided)	1 block
	Least Common Multiple	Big Ideas: Chapter 1, Lesson 5 (1.5)	1 block
		Review/Flex Days	½ block
		Test Day	1 block
2: Fractions and Decimals	Multiplying Fractions	Big Ideas: Chapter 2, Lesson 1 (2.1)	1 block
	Dividing Fractions	Big Ideas: Chapter 2, Lesson 2 (2.2)	1 block
	Dividing Mixed Numbers	Big Ideas: - Chapter 2, Lesson 3 (2.3) Engaging Experiences: 2: Traffic Jam (modified version provided)	1 block
	Add and subtract Decimals	Big Ideas: Chapter 2, Lesson 4 (2.4)	1 block
	Multiply Decimals	Big Ideas: Chapter 2, Lesson 5 (2.5)	1 block
	Dividing Whole Numbers	Big Ideas: Chapter 2, Lesson 6	1 block
	Dividing Decimals	Big Ideas: Chapter 2, Lesson 7 (2.7)	1 block

		Review/Flex Days	1 block
		Test Day	1 block
3: Percentages	Order Fractions and Decimals	Big Ideas: - Chapter 4, Lesson 3 Engaging Experiences: 3: Continuum of Equivalence with Decimals, Fractions, & Percents (modified version provided)	1 block
	Percents and Fractions	Big Ideas: Chapter 4, Lesson 1 (4.1)	1 block
	Percents and Decimals	Big Ideas: Chapter 4, Lesson 2 (4.2)	1 block
	Solving Percent Problems	Big Ideas: - Chapter 4, Lesson 4 Engaging Experiences: - Parking Lot Percents (modified version provided)	1 block
		Review/Flex Days	1 block
		Test Day	1 block
Engaging Scenario: Students apply division of fractions and integer reasoning in real-world contexts by modeling measurement, gaming, and temperature scenarios. They represent and justify their thinking using equations, models, and data displays in the Cups of Rice, Video Game Credits, & Temperatures tasks. Use an end-of-unit exam as a summative assessment OR use the provided modified version of this Engaging Scenario to assess unit skills.			1 block

Unit 2: Ratios & Proportional Relationships

Subject: Mathematics

Grade: 6th Grade

Name of Unit: Ratios & Proportional Relationships

Length of Unit: 11 blocks

Overview of Unit:

Students explore relationships between quantities using ratios, unit rates, and equivalent ratios. They represent these relationships using tables, graphs, equations, and verbal descriptions. Real-world applications include unit pricing, percentages, and measurement conversions. Students develop flexible strategies to compare and analyze proportional situations. Students will model, solve and comprehend word problems involving ratios, models and interpret their solutions. This unit builds a foundation for proportional reasoning used in advanced mathematics and everyday decision-making.

Priority Standards for unit:

- 6.RP.A.1 Understand a ratio as a comparison of two quantities and represent these comparisons.
- 6.RP.A.3.a Solve problems involving ratios and rates. Create tables of equivalent ratios, find missing values in the tables and plot the pairs of values on the Cartesian coordinate plane.
- 6.RP.A.3.b Solve problems involving ratios and rates. Solve unit rate problems.
- 6.RP.A.3.d Solve problems involving ratios and rates. Convert measurement units within and between two systems of measurement.

Supporting Standards for unit:

- 6.RP.A.2 Understand the concept of a unit rate associated with a ratio, and describe the meaning of unit rate.

Essential Questions:

1. How can we compare two quantities in meaningful ways?
2. What does a unit rate tell us about a situation?
3. How can we represent a ratio using tables, graphs, equations, tape diagrams, and words?
How do these help us solve ratio problems?
4. How can proportional reasoning help us make decisions in real life?
5. When are two ratios equivalent, and why does that matter?

Enduring Understanding/Big Ideas:

1. Ratios describe relationships between quantities and can be represented in multiple ways.
2. Unit rates provide a way to compare and interpret real world situations.
3. Mathematical representations (tables, graphs, equations, tape diagrams) reveal patterns and relationships between the parts and total of ratios.

4. Proportional reasoning helps us solve problems involving scaling, pricing, and conversion of measurements.
5. Equivalent ratios represent the same relationship, even when values in the ratio change.

Unit 2 Engaging Scenario

Engaging Scenario 1 block

In this scenario comprised of two tasks, students apply their understanding of ratios and proportional relationships to real-world situations involving [decision-making](#) and [fundraising](#). They analyze the results of a classroom vote using ratios to draw and justify conclusions, and use proportional reasoning to determine how many items must be sold to meet a financial goal. Students represent their thinking using tables, graphs, and equations while making connections between ratios and real-world contexts. Throughout the scenario, students explain their reasoning and justify their solutions.

[Naming a Classroom Pet](#) (Ratios & Proportional Relationships)

[Water Bottles](#) (Ratios & Proportional Relationships)

Engaging Scenarios may be used as part of the block period allotted for Unit Assessments.

Topic 1: Ratios & Rates

<u>Cross-Cutting Terms:</u>		Grade-Specific Terms	
value of a ratio U.S. customary system equivalent rates	equivalent ratios rate ratio ratio table	conversion factor metric system unit analysis value of a ratio	
Priority Standards & Supporting Standards	Learning Targets	Success Criteria	Aligned Sections from Course Resource
6.RP.A.1 6.RP.A.3.a	The student will understand the principles of ratios and equivalent ratios.	- I can write and interpret ratios using appropriate notation and language. - I can recognize multiplicative relationships in ratios to recognize equivalence. - I can describe how to determine whether ratios are equivalent. - I can name ratios equivalent to a given ratio.	3.1 Ratios
6.RP.A.1 6.RP.A.3.a	The student will use tape diagrams to model and solve ratio problems.	- I can interpret tape diagrams that represent ratio relationships. - I can draw tape diagrams to model ratio relationships. - I can find the value of one part of a tape diagram. - I can use tape diagrams to solve ratio problems.	3.2 Using Tape Diagrams
6.RP.A.1 6.RP.A.3.a	The student will use ratio tables to represent equivalent ratios and solve ratio problems.	- I can use various operations to create tables of equivalent ratios. - I can use ratio tables to	3.3 Using Ratio Tables

		solve ratio problems. ● I can use ratio tables to compare ratios.	
6.RP.A.1 6.RP.A.3.a	The student will represent ratio relationships in a coordinate plane.	● I can create and plot ordered pairs from a ratio relationship. ● I can create graphs to solve ratio problems. ● I can create graphs to compare ratios.	3.4 Graphing Ratio Relationships
6.RP.A.1 <i>6.RP.A.2</i> 6.RP.A.3.b	The student will understand the concept of a unit rate and solve rate problems.	● I can find unit rates. ● I can use unit rates to solve rate problems. ● I can use unit rates to compare rates.	3.5 Rates & Unit Rates
6.RP.A.1 <i>6.RP.A.2</i> 6.RP.A.3.d	The student will use ratio reasoning to convert units of measure.	● I can write conversion facts as unit rates. ● I can convert units of measure using ratio tables. ● I can convert units of measure using conversion factors. ● I can convert rates using conversion factors.	3.6 Converting Measures

Engaging Experience 1

Title: Better Buy (Rates & Unit Rates)		Blocks: 1
Learning Target(s): • The student will understand the concept of a unit rate and solve rate problems.	Success Criteria: • I can find unit rates. • I can use unit rates to solve rate problems. • I can use unit rates to compare rates.	
Rich Task: • Students will research the cost of several basic items (ie, toilet paper, their favorite soft drink, a package of pencils, etc) to find the best deal using unit rate. • Students should find multiple cost/quantities for each item at least three stores (ie. local grocery store, bulk wholesaler, etc). • After identifying the cost and quantity at each store, students will determine unit rate for each item and identify the cheapest option to purchase each item.	Instructional Suggestions: • Pre-select exact item choices for students to look up to help ensure that multiple price-points/purchase options are available. • A template slide for students to compile prices and number of units would be a helpful organizational tool for students to utilize as they compile data. • Encourage students to carefully define the unit (e.g., cost per item) before calculating unit rates. • Prompt students to compare results across stores and justify which option is the best value. • Ask students to explain how unit rate supports decision-making in real-world contexts. • Support productive struggle by having students reconcile conflicting or unexpected results.	
Student Math Practices: ●MP1 ●MP2 ●MP3 ●MP4 ●MP5 ●MP6 ●MP7 ●MP8		
Resources: • Websites for local retail stores.		
Modified Version: The Snack Shop Comparison Instead of having students conduct open-ended research, provide students pre-made visual ‘store cards’ for two fictional stores (e.g., "Mega Mart" vs. "Corner Store"). Each card should show a picture of a snack (e.g., a 6-pack of Gatorade for \$12 vs. a 12-pack for \$18). Provide students a ‘Unit Rate Graphic Organizer’ on which to record numbers. Students will then use calculators to divide: Price ÷ Quantity. Students highlight the lower unit rate in green to identify the winner. For students with high frustration levels, replace productive struggle with immediate feedback by checking their first calculation before they move to the second to ensure they aren't practicing an error.		

Provide students a ‘Word Wall’ that visually links the words “Each” and “Per to the number 1.

Summary of Unit 2 Engaging Learning Experiences

Topic	Section	Experiences	Suggested Length of Time
1: Ratios and Rates	Ratios	Big Ideas: Chapter 3, Lesson 1 (3.1)	1 block
	Using Tape Diagrams	Big Ideas: Chapter 3, Lesson 2 (3.2)	1 block
	Using Ratio Tables	Big Ideas: Chapter 3, Lesson 3 (3.3)	1 block
	Graphing Ratio Relationships	Big Ideas: Chapter 3, Lesson 4 (3.4)	2 block
	Rates and Unit Rates	Big Ideas: - Chapter 3, Lesson 5 (3.5) Engaging Experiences: 1: Better Buy (Rates & Unit Rates) (modified version provided)	2 block
	Converting Measures	Big Ideas: Chapter 3, Lesson 6 (3.6)	1 block
		Review/Flex Days	1 block
		Test Day	1 block
Engaging Scenario: Students use ratios and proportional reasoning to analyze voting results and solve a real-world fundraising problem, representing and justifying their thinking with multiple strategies in the Naming a Classroom Pet and Water Bottles tasks. Use an end-of-unit exam as a summative assessment to assess unit skills.			1 block

Unit 3: Expressions, Equations, & Inequalities

Subject: Mathematics

Grade: 6th Grade

Name of Unit: Expressions, Equations, & Inequalities

Length of Unit: 24 blocks

Overview of Unit: Students develop algebraic thinking by writing, interpreting, and evaluating expressions with variables and exponents. They distinguish between expressions, equations, and inequalities and use properties of operations to generate equivalent expressions. Students solve one-step equations and inequalities and represent solutions in multiple ways. Real-world contexts are used to model and analyze relationships between quantities. This unit introduces students to the language and structure of algebra.

Priority Standards for unit:

- 6.EE.A.1 Describe the difference between an expression and an equation.
- 6.EE.A.2.d Create and evaluate expressions involving variables and whole number exponents. Write and evaluate algebraic expressions.
- 6.EE.A.2.e Create and evaluate expressions involving variables and whole number exponents. Understand the meaning of the variable in the context of the situation.
- 6.EE.A.3 Identify and generate equivalent algebraic expressions using mathematical properties.
- 6.EE.B.5 Understand that if any solutions exist, the solution set for an equation or inequality consists of values that make the equation or inequality true.
- 6.EE.B.6 Write and solve equations using variables to represent quantities, and understand the meaning of the variable in the context of the situation.
- 6.EE.C.9.a Identify and describe relationships between two variables that change in relationship to one another. Write an equation to express one quantity, the dependent variable, in terms of the other quantity, the independent variable.
- 6.EE.C.9.b Identify and describe relationships between two variables that change in relationship to one another. Analyze the relationship between the dependent and independent variables using graphs, tables and equations and relate these representations to each other.

Supporting Standards for unit:

- 6.EE.A.2.a Create and evaluate expressions involving variables and whole number exponents. Identify parts of an expression using mathematical terminology.
- 6.EE.A.2.b Create and evaluate expressions involving variables and whole number exponents. Evaluate expressions at specific values of the variables.
- 6.EE.A.2.c Create and evaluate expressions involving variables and whole number exponents. Evaluate non-negative rational number expressions.
- 6.EE.B.4 Use substitution to determine whether a given number in a specified set makes a one-variable equation or inequality true.

- 6.EE1.B.7 Solve one-step linear equations in one variable involving non-negative rational numbers.
- 6.EE1.B.8.a Recognize that inequalities may have infinitely many solutions. Write an inequality of the form $x > c$, $x < c$, $x \geq c$ or $x \leq c$ to represent a constraint or condition. Graph the solution set of an inequality.
- 6.EE1.B.8.b Recognize that inequalities may have infinitely many solutions. Graph the solution set of an inequality.
- 6.NS.B.4.b Find common factors and multiples. Use the distributive property to express a sum of two whole numbers with a common factor as a multiple of a sum of two whole numbers.

Essential Questions:

1. How can we use variables to represent unknown quantities?
2. What is the difference between an expression, an equation, and an inequality?
3. How do properties of operations help us rewrite expressions and solve equations/inequalities?
4. What does it mean to “solve” a problem algebraically?
5. How do equations in one variable help me with equations in two variables?
6. How can expression, equations and inequalities model real-world situations?

Enduring Understanding/Big Ideas:

1. Variables allow us to generalize patterns and represent unknowns.
2. An expression is a combination of numbers, variables, and operators that represents a value. It cannot be solved, only simplified. An equation states that two expressions are equal, indicated by an equals sign. It can be solved to find the value of a variable. An inequality, indicated by inequality signs, indicates two expressions are not equal to each other. It can be solved to find the possible values of a variable.
3. Properties of operations allow us to rewrite expressions in equivalent forms and solve for variables in equations.
4. Solving equations algebraically is finding values that make a statement true using inverse operations to isolate the variable.
5. Equations in one variable are the fundamental building blocks for solving equations in two variables. They help by allowing you to break down complex, multi-variable problems into manageable, single-variable, solvable pieces.
6. Algebra provides a way to model and solve real-world problems and efficiently solve for unknown variables.

Unit 3 Engaging Scenario

Engaging Scenario 1 block

In this scenario comprised of three tasks, students apply their understanding of expressions, equations, inequalities, and number relationships to real-world and strategic contexts. They [create and evaluate expressions](#) to maximize value using given constraints, and analyze real-world situations by determining whether [conditions meet specific requirements](#) using equations or inequalities. Students also explore [relationships between parts of a whole and parts of a part](#) to deepen their understanding of numerical reasoning. Throughout the scenario, students represent their thinking with models, equations, and explanations, justifying their decisions and making connections across mathematical concepts.

[Rolling Number Cube](#) (Expressions, Equations, & Inequalities)

[Standing in Line](#) (Expressions, Equations, & Inequalities)

[Leftover Cake](#) (Number Systems & Operations)

Engaging Scenarios may be used as part of the block period allotted for Unit Assessments.

Topic 1: Algebraic Expressions & Properties

<u>Cross-Cutting Terms:</u>	Grade-Specific Terms
factoring an expression like terms distributive property substitute	addition property of zero algebraic expression associative property of addition associative property of multiplication coefficient commutative property of addition commutative property of multiplication constant equivalent expressions term variable multiplication property of Zero multiplication property of One

Priority Standards & Supporting Standards	Learning Targets	Success Criteria	Aligned Sections from Course Resource
6.EE1.A.1 <i>6.EE1.A.2.a</i> <i>6.EE1.A.2.c</i> 6.EE1.A.2.d 6.EE1.A.2.e	The student will identify and evaluate algebraic expressions using substitution for given variables.	- I can describe the difference between an expression and an equation. - I can identify parts of an algebraic expression. - I can evaluate algebraic expressions with one or more variables. - I can evaluate algebraic expressions with one or more operations	5.1 Algebraic Expressions
<i>6.EE1.A.2.a</i> <i>6.EE1.A.2.b</i> <i>6.EE1.A.2.c</i> 6.EE1.A.2.d 6.EE1.A.2.e	The student will write algebraic expressions and solve problems involving algebraic expressions.	- I can write numerical expressions. - I can write algebraic expressions. - I can write and evaluate algebraic expressions that represent real-life problems.	5.2 Writing Expressions

6.EE1.A.2.a 6.EE1.A.3 6.NS.B.4.b	The student will identify that equivalent algebraic expressions are created as a result of the application of commutative, associative, or distributive properties.	● I can explain the meaning of equivalent expressions. ● I can use properties of addition to generate equivalent expressions. ● I can use properties of multiplication to generate equivalent expressions. ● I can use the distributive property to generate equivalent expressions.	5.3 Properties of Addition and Multiplication
6.EE1.A.2.a 6.EE1.A.3 6.NS.B.4.b	The student will apply the Distributive Property to generate equivalent expressions.	● I can explain how to apply the Distributive Property. ● I can use the Distributive Property to simplify algebraic expressions. ● I can use the Distributive Property to combine like terms.	5.4 The Distributive Property
6.EE1.A.2.a 6.EE1.A.2.c 6.EE1.A.3 6.NS.B.4.b	The student will factor numerical and algebraic expressions.	● I can use the Distributive Property to factor numerical expressions. ● I can identify the greatest common factor of terms including variables. ● I can interpret factored expressions in real-life problems.	5.5 Factoring Expressions

Engaging Experience 1

Title: Seven to the What?!?		Blocks: ½
Learning Target(s): Write and evaluate numerical expressions involving whole-number exponents.	Success Criteria: - I can write products of repeated factors as powers. - I can evaluate powers.	
Rich Task: - What is the last digit of ? Explain. - What are the last two digits of ? Explain. - Students explore patterns in powers of whole numbers to determine the last digit (and last two digits) of large exponential expressions without direct computation. By examining smaller powers and identifying repeating patterns, students use regularity in repeated reasoning to make and justify generalizations about place value patterns in exponential growth. At first glance, this might seem like an impossible problem because the number 7^{2011} is much too large to evaluate even with a calculator. It requires a starting point, and, to many, such a starting point might not be obvious. Students who successfully answer this problem must "look for and express regularity in repeated reasoning" (MP8), and so the purpose of this task is to give students an opportunity to engage in MP8 and to practice working with positive integer exponents.	Instructional Suggestions: - Encourage students to compute and organize smaller powers to identify patterns in the last digit. - Prompt students to look for and articulate repetition cycles, connecting their observations to exponents. - Use purposeful questions to press students to justify why the pattern will continue for very large exponents. - Facilitate discussion that connects repeated reasoning to broader mathematical structures.	
Student Math Practices: ●MP1 ●MP2 ●MP3 ●MP4 ●MP5 ●MP6 ●MP7 ●MP8		
Resources: 'Seven to the What?!?' from Illustrative Math		
Modified Version: Model observations, and start small instead of jumping to large exponents— What is the last digit of: 2^6 What do you notice? Help students build the pattern— Provide students a prepared table:		

Power	Value	Last Digit
2^1	2	2
2^2	4	4
2^3	8	8
2^4	16	6
2^5	32	2
2^6	64	4

Ask: “What are the last digits?” → 2, 4, 8, 6, 2, 4... and “Do they repeat??”
→ Yes

Circle the pattern: 2, 4, 8, 6

Simplify the big idea—

Instead of “What is the last digit of 2^{7011} ?” ask “What is the last digit of 2^{10} ?” and then “What about 2^{12} ?” to clarify the shortcut.

Topic 2: Equations

<u>Cross-Cutting Terms:</u>		Grade-Specific Terms	
addition property of equality division property of equality multiplication property of equality subtraction property of equality		dependent variable equation equation in two variables independent variable inverse operations multiplication property of one	multiplicative inverse property solution (of an equation) solution of an equation in two variables multiplication property of Zero
Priority Standards & Supporting Standards	Learning Targets	Success Criteria	Aligned Sections from Course Resource
6.EE1.A.1 6.EE1.B.4 6.EE1.B.6 6.EE1.B.7	The student will write equations in one variable and write equations that represent real-life problems.	• I can identify key words and phrases that indicate equality. • I can write word sentences as equations. • I can create equations to represent real life problems.	6.1 Writing Equations in One Variable 8.7 Writing inequalities in one variable
6.EE1.B.4 6.EE1.B.5 6.EE1.B.6 6.EE1.B.7	The student will write and solve equations using addition or subtraction.	• I can determine whether a value is a solution of an equation. • I can apply the Addition and Subtraction Properties of Equality to generate equivalent equations. • I can solve equations using addition or subtraction. • I can create equations involving addition or subtraction to solve real-life problems.	6.2 Solving Equations Using Addition or Subtraction 8.7 Solving inequalities using addition and subtraction in one variable.
6.EE1.B.4 6.EE1.B.5 6.EE1.B.6	The student will write and solve equations using multiplication or division.	• I can apply the Multiplication and Division Properties of Equality to generate	6.3 Solving Equations Using Multiplication &

6.EE1.B.7		equivalent equations. ● I can solve equations using multiplication or division. ● I can create equations involving multiplication or division to solve real life problems.	Division
6.EE1.B.6 6.EE1.C.9.a 6.EE1.C.9.b	The student will write equations in two variables and analyze the relationship between the two quantities.	● I can determine whether an ordered pair is a solution of an equation in two variables. ● I can differentiate between independent and dependent variables. ● I can write and graph an equation in two variables. ● I can create equations in two variables to solve real-life problems.	6.4 Writing Equations in Two Variables

Engaging Experience 2

Title: Gym		Blocks: ½
Learning Target(s): • The student will write and solve equations using addition or subtraction. • The student will write and solve equations using multiplication or division.	Success Criteria: • I can apply the Multiplication and Division Properties of Equality to generate equivalent equations. • I can solve equations using multiplication or division. • I can create equations involving multiplication or division to solve real life problems. • I can apply the Multiplication and Division Properties of Equality to generate equivalent equations. • I can solve equations using multiplication or division. • I can create equations involving multiplication or division to solve real life problems.	
Rich Task: • Using provided information about the gym memberships, students will calculate and compare costs of memberships to find the break-even point when two types of fee rules would be equal and record their findings.	Instructional Suggestions: • Encourage students to represent each pricing structure with an equation or table. • Prompt students to identify and interpret the break-even point in context. • Ask students to justify how their solution represents equality between the two options. • Facilitate comparison of graphical, algebraic, and numerical approaches.	
Student Math Practices: ●MP1 ●MP2 ●MP3 ●MP4 ●MP5 ●MP6 ●MP7 ●MP8		
Resources: • ‘The Gym Problem’		

Engaging Experience 3

Title: Boxes	Blocks: $\frac{1}{2}$
Learning Target(s): • The student will write equations in one variable and write equations that represent real life problems use physical objects to demonstrate that "equal" means "balanced." • The student will write and solve equations using addition or subtraction. replace a physical object with a "Mystery Box" (\$x\$) and solve for its value. • The student will write and solve equations using multiplication or division. translate a "balanced" picture into a simple addition or subtraction equation.	Success Criteria: • I can identify key words and phrases that indicate equality. • I can write word sentences as equations. • I can create equations to represent real life problems. • I can solve equations using addition or subtraction. • I can create equations involving addition or subtraction to solve real-life problems. • I can solve equations using multiplication or division. • I can create equations involving multiplication or division to solve real life problems. • I can tell if a scale is balanced or unbalanced. • I can use subtraction to "find the missing piece" on a balanced scale. • I can use the word "is" or "same as" to represent the equals sign (\$=\$).
Rich Task: • The task challenges a student to demonstrate understanding of equality. A student must make sense of different mathematical contexts for equality such as scales and balance beams. Using a pictorial representation of the weight of different numbered blocks on either side of a scale, a student must use mathematical reasoning to determine which box is the heaviest. Given additional scenarios with a balance scale, a student must continue to make sense of equivalent weights to determine in each scenario the heaviest box.	Instructional Suggestions: • Present task as pictures on the screen and have students work at vertical learning boards. • Give questions verbally (i.e., "How do I know which box is heavier [4, 5, or 6]? Does the larger number indicate a heavier box?" etc.) • Encourage students to interpret visual models (scales) and connect them to equations. • Prompt students to reason about equivalence by maintaining balance across representations. • Ask students to justify their conclusions about which object is heaviest using evidence. • Facilitate discussion comparing strategies and emphasizing the meaning of equality.

Student Math Practices:

●MP1

●MP2

●MP3

●MP4

●MP5

●MP6

●MP7

●MP8

Resources:

- [The Box Problem](#)

Modified Version:

Provide a color-coded reference sheet—

Example: If Box A + 2 = 10 and Box B + 5 = 10, provide a visual showing that Box A must be "bigger" because it needs less help to reach 10.

Ask: "If I have a small snack and a big snack, which one needs more 'extra' to fill my stomach?"

Provide a 'Vocabulary Anchor Chart'—

Balanced / Same As / Total → =

Put together / More / Added → +

Difference / Taken away / Left → -

Topic 3: Integers, Number Lines, & the Coordinate Plane: *Inequalities*

<u>Cross-Cutting Terms:</u>		Grade-Specific Terms	
addition property of inequality division property of inequality graph of an inequality multiplication property of inequality solution of an inequality solution set subtraction property of inequality		inequality integers	
Priority Standards & Supporting Standards	Learning Targets	Success Criteria	Aligned Sections from Course Resource
6.EE1.B.4 6.EE1.B.5 6.EE1.B.8.a 6.EE1.B.8.b	The student will write inequalities and represent solutions of inequalities on number lines.	● I can write word sentences as inequalities. ● I can determine whether a value is a solution of an inequality. ● I can graph the solutions of inequalities.	8.7 Writing and Graphing Inequalities
6.EE1.B.4 6.EE1.B.5 6.EE1.B.6 6.EE1.B.8.a 6.EE1.B.8.b	The student will write and solve inequalities.	● I can apply the properties of inequality to generate equivalent inequalities. ● I can solve inequalities using addition or subtraction. ● I can solve inequalities using multiplication or division. ● I can write and solve inequalities that represent real-life problems	8.8 Solving Inequalities

Summary of Unit 3 Engaging Learning Experiences

Topic	Section	Experiences	Suggested Length of Time
1: Algebraic Expression & Properties	Algebraic Expressions	Big Ideas: 5.1 Algebraic Expressions Engaging Experiences: 1: Seven to the What!?! (modified version provided)	2 blocks
	Writing Expressions	Big Ideas: 5.2 Writing Expressions	1 block
	Properties of Addition & Multiplication	Big Ideas: 5.3 Properties of Addition & Multiplication	1 block
	The Distributive Property	Big Ideas: 5.4 The Distributive Property	2 blocks
	Factoring Expressions	Big Ideas: 5.5 Factoring Expressions	2 blocks
		Review/Flex Days	2 blocks
		Test Day	1 block
2: Equations	Write Equations & Inequalities in One Variable	Big Ideas: 6.1 Writing Equations in One Variable 8.7 Writing & Graphing Inequalities	3 blocks
	Solve Equations & Inequalities in One Variable with graphed solutions	Big Ideas: 6.2 Solving Equations Using Addition or Subtraction 6.3 Solving Equations Using Multiplication or Division Engaging Experiences: 2: Gym (modified version provided) 3: Boxes (modified version provided)	5 blocks

3: Integers, Number Lines, & the Coordinate Plane: <i>Inequalities</i>	Writing and Graphing Inequalities	Big Ideas: 8.7 Writing and Graphing Inequalities	1 block
	Solving Inequalities	Big Ideas: 8.8 Solving Inequalities	1 block
		Review/Flex Days	1 block
		Test Day	1 block
Engaging Scenario: Students apply expressions, equations, and inequalities to solve real-world and strategic problems, representing and justifying their reasoning while exploring relationships within numbers in the Rolling Number Cube, Standing in Line, & Leftover Cake tasks. Use an end-of-unit exam as a summative assessment to assess unit skills.			1 block

Unit 4: Data, Statistics, Probability, Geometry, & Measurement

Subject: Mathematics

Grade: 6th Grade

Name of Unit: Data, Statistics, Probability, Geometry, & Measurement

Length of Unit: 24 blocks

Overview of Unit: Students investigate statistical questions and learn to collect, represent, and analyze data using measures of center, variability, and distribution shape. They use graphical displays to interpret and communicate findings, applying statistical reasoning to real-world contexts to identify patterns and make informed decisions. Building on this foundation, students analyze two- and three-dimensional figures by finding area, surface area, and volume using models and formulas. They decompose complex shapes and use the coordinate plane—graphing points in all four quadrants—to explore area, perimeter, distance, and reflections of polygons, strengthening problem-solving through visualization and measurement.

Priority Standards for unit:

- 6.DSP.A.2 Understand that a set of data collected to answer a statistical question has a distribution which can be described by its center, spread and overall shape.
- 6.DSP.B.5.d Summarize numerical data sets in relation to the context. Analyze the choice of measures of center and variability based on the shape of the data distribution and/or the context of the data.
- 6.GM.A.3.a Solve problems by graphing points in all four quadrants of the Cartesian coordinate plane. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the Cartesian coordinate plane.
- 6.GM.A.3.b Solve problems by graphing points in all four quadrants of the Cartesian coordinate plane. Recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
- 6.GM.A.3.c Solve problems by graphing points in all four quadrants of the Cartesian coordinate plane. Find distances between points with the same first coordinate or the same second coordinate.
- 6.GM.A.3.d Solve problems by graphing points in all four quadrants of the Cartesian coordinate plane. Construct polygons in the Cartesian coordinate plane.
- 6.NS.C.6.c Locate a rational number as a point on the number line. Understand that a number and its opposite (additive inverse) are located on opposite sides of zero on the number line.
- 6.NS.C.7 Understand that the absolute value of a rational number is its distance from 0 on the number line.

Supporting Standards for unit:

- 6.DSP.A.1 Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers.

- 6.DSP.A.3 Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary from a single number.
- 6.DSP.B.4.a Display and interpret data. Use dot plots, histograms and box plots to display and interpret numerical data.
- 6.DSP.B.4.b Display and interpret data. Create and interpret circle graphs.
- 6.DSP.B.5.a Summarize numerical data sets in relation to the context. Report the number of observations.
- 6.DSP.B.5.b Summarize numerical data sets in relation to the context. Describe the nature of the attribute under investigation, including how it was measured and its units of measurement.
- 6.DSP.B.5.c Summarize numerical data sets in relation to the context. Give quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context of the data.
- 6.GM.A.1 Find the area of polygons by composing or decomposing the shapes into rectangles or triangles.
- 6.GM.A.2.a Find the volume of right rectangular prisms. Understand that the volume of a right rectangular prism can be found by filling the prism with multiple layers of the base.
- 6.GM.A.2.b Find the volume of right rectangular prisms. Apply $V = l * w * h$ and $V = Bh$ to find the volume of right rectangular prisms.
- 6.GM.A.4.a Solve problems using nets. Represent three-dimensional figures using nets made up of rectangles and triangles.
- 6.GM.A.4.b Solve problems using nets. Use nets to find the surface area of three-dimensional figures whose sides are made up of rectangles and triangles.
- 6.NS.C.5 Use positive and negative numbers to represent quantities.
- 6.NS.C.6.a Locate a rational number as a point on the number line. Locate rational numbers on a horizontal or vertical number line.
- 6.NS.C.6.b Locate a rational number as a point on the number line. Write, interpret and explain problems of ordering of rational numbers.

Essential Questions:

1. What makes a question a statistical question?
2. How can we describe and summarize data effectively?
3. What do measures like mean, median, and range, median absolute deviation and interquartile range tell us about a data set?
4. How can graphs be used to represent and interpret data?
5. How can data help us make predictions or decisions?
6. How can complex/ composite shapes be broken into simpler parts? Why is doing so helpful?

7. How do area, surface area, and volume help us solve real-world problems?
8. How are two and three-dimensional figures related?
9. How can the coordinate plane help us represent and analyze shapes?
10. How do distance and transformations change the position of figures on the coordinate plane?

Enduring Understanding/Big Ideas:

1. Statistical questions can be answered by collecting data, you expect a variety of answers and are interested in the distribution and tendency of those answers.
2. Data distributions can be described by center, spread, and shape.
3. Measures of center (mean, median and mode) and variability (MAD and IQR) help summarize data sets meaningfully.
4. Data is represented in different ways (histogram, box plot, dot plot, circle graphs) to highlight different features of collected data.
5. Data analysis supports informed decision-making.
6. Composite figures can be decomposed into basic polygons allowing us to find perimeter, area and surface area of figures.
7. Volume and surface area measure different attributes of three-dimensional objects and can be used to solve real-world problems.
8. Three dimensional figures can be dissected into two dimensional parts (nets).
9. The coordinate plane provides a way to represent and analyze geometric relationships by finding distance between vertices (points on the coordinate plane) and using those distances to calculate area and perimeter of a given figure or composite figure.
10. Distance and transformations (like reflections) help students to understand the relationships between given points.

Unit 4 Engaging Scenario

Engaging Scenario 1 block

In this scenario, students [take on the role of data analysts](#) by developing and investigating their own statistical questions. They collect, represent, and analyze data using multiple displays and measures, drawing conclusions based on patterns in the data. Students evaluate their findings and communicate results clearly, justifying their reasoning and making connections between data and real-world contexts.

[Become a Data Analyst](#) (Statistical Measures & Data)

Engaging Scenarios may be used as part of the block period allotted for Unit Assessments.

Topic 1: Integers, Number Lines, & the Coordinate Plane: *Integers & the Coordinate Plane*

<u>Cross-Cutting Terms:</u>		Grade-Specific Terms	
rational number composite figure integers		absolute value coordinate plane negative numbers opposites origin positive numbers quadrants	
Priority Standards & Supporting Standards	Learning Targets	Success Criteria	Aligned Sections from Course Resource
6.NS.C.5 6.NS.C.6.a 6.NS.C.6.c 6.GM.A.3.a	The student will understand the concept of negative numbers and that they are used along with positive numbers to describe quantities.	- I can write integers to represent quantities in real life. - I can graph integers on a number line. - I can find the opposite of an integer. - I can apply integers to model real-life problems.	8.1 Integers
6.NS.C.5 6.NS.C.6.b	The student will compare and order integers.	- I can explain how to determine which of two integers is greater. - I can order a set of integers from least to greatest. - I can interpret statements about order in real-life problems.	8.2 Comparing and Ordering Integers
6.NS.C.5 6.NS.C.6.b 6.GM.A.3.a	The student will compare and order rational numbers.	- I can explain the meaning of a rational number. - I can graph rational numbers on a number line. - I can determine which of two rational numbers is	8.3 Rational Numbers

		greater. ● I can order a set of rational numbers from least to greatest.	
6.NS.C.5 6.NS.C.7	The student will understand that the absolute value of a rational number is its distance from zero. The student will understand that distances are always positive. The student will calculate the absolute value of integers.	● I can find the absolute value of a number. ● I can make comparisons that involve absolute values of numbers. ● I can apply absolute value in real-life problems.	8.4 Absolute Value
6.NS.C.6.a 6.NS.C.6.c 6.GM.A.3.a 6.GM.A.3.b 6.GM.A.3.c	The student will plot and reflect ordered pairs in all four quadrants of a coordinate plane.	● I can identify ordered pairs in a coordinate plane ● I can plot ordered pairs in a coordinate plane and describe their locations. ● I can reflect points in the x-axis, the y-axis, or both axes. ● I can apply plotting points in all four quadrants to solve real-life problems.	8.5 The Coordinate Plane
6.GM.A.1 6.GM.A.3.b 6.GM.A.3.c 6.GM.A.3.d	The student will draw polygons in the coordinate plane and find distances between points in the coordinate plane. The student will find the area of polygons by composing or decomposing the shapes into rectangles, triangles, and composite figures and/or applying these techniques to solve problems with or without	● I can draw polygons in the coordinate plane and find their area and perimeter. ● I can find distances between points in the coordinate plane with the same x-coordinates or the same y-coordinates. ● I can find horizontal and vertical side lengths of polygons in the coordinate plane. ● I can draw polygons in the coordinate plane to solve real-life problems.	8.6 Polygons in the Coordinate Plane

	context.	● I can explain how the area of a rectangle is used to find the area of a parallelogram. ● I can use the base and the height of a parallelogram to find its area. ● I can use the area of a parallelogram and one of its dimensions to find the other dimension. ● I can use decomposition to find the area of a figure. ● I can explain how the area of a parallelogram is used to find the area of a triangle. ● I can use the base and the height of a triangle to find its area. ● I can use the area of a triangle and one of its dimensions to find the other dimension. ● I can use decomposition to find the area of a figure.	
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Engaging Experience 1

Title: Above and Below Sea Level		Blocks: ½
Learning Target(s): - The student will explain the concept of negative numbers and that they are used along with positive numbers to describe quantities. - The student will use a vertical number line to show that "below" means "negative." - The student will identify "Zero" as the starting point (Sea Level). - The student will match real-world words (sink, drop, below) to the negative sign (-).		Success Criteria: - I can write integers to represent quantities in real life. - I can graph integers on a number line. - I can find the opposite of an integer. - I can apply integers to model real-life problems. - I can find "0" on a vertical scale. - I can use a minus sign (-) for things underwater. - I can find the "mirror image" (opposite) of a number on a scale.
Rich Task: Given the table in the document students will finish filling in the table as you think about the following statements. Decide whether each of the following statements is true or false. Explain your answer for each one. Students will fill in the data table with missing information and decide and defend their answers.		Instructional Suggestions: - Encourage students to complete the table systematically and look for patterns. - Prompt students to justify each true/false decision with evidence from the table. - Use purposeful questions to deepen reasoning about relationships in the data. - Facilitate discussion where students critique and refine each other's justifications.
Student Math Practices: ●MP1 ●MP2 ●MP3 ●MP4 ●MP5 ●MP6 ●MP7 ●MP8		
Resources: ● ‘Above and Below Sea Level’ from Illustrative Math		
Modified Version: The Deep Sea Dive Scaffold the task— Instead of a standard table, provide a ‘Visual Map’ of the ocean with specific landmarks (e.g., a bird at +10, a boat at 0, a fish at -5, and a shipwreck at -15). Label the map and have students write the integer next to each picture.		

Play 'The Opposite Game': "If a bird is 10 feet *above* the water, where would a 'mirror bird' be if it were 10 feet *under* the water?"

True/False sorting: Provide physical cards with statements like "A shark at -10 is deeper than a crab at -2." Students physically place these under a 'True' or 'False' header on their vertical learning boards.

Other supports to consider:

Use vertical number lines to align the physical reality of 'above and below' and prevent the 'left/right' confusion.

Use color coding, e.g., for positive numbers (+) use blue (sky/air), for zero (0) use yellow (the beach/the surface), and for negative numbers (-) use red or dark blue (deep water)

Topic 2: Statistical Measures

<u>Cross-Cutting Terms:</u>		Grade-Specific Terms	
None		first quartile interquartile range mean mean absolute deviation (MAD) measure of center measure of variation median	mode outlier quartiles range (of a data set) statistical question statistics third quartile
Priority Standards & Supporting Standards	Learning Targets	Success Criteria	Aligned Sections from Course Resource
6.DSP.A.1 6.DSP.A.2 6.DSP.B.4.a 6.DSP.B.5.c	The student will be able to recognize a statistical question and answer questions related to the data.	● I can recognize that statistical questions have a variety of answers. ● I can construct and interpret a dot plot. ● I can use data to answer a statistical question.	9.1 Introduction to Statistics
6.DSP.A.2 6.DSP.B.5.a 6.DSP.B.5.b 6.DSP.B.5.c 6.DSP.B.5.d 6.DSP.A.3	The student will understand that a set of data has a distribution that can be described by its center, spread, and overall shape. The student will describe the nature and attributes of data and include how it was measured including measures of center (mean, median, mode)	● I can identify measures of center (mean, median, and mode) ● Use the best measure of center to analyze data ● Analyze the shape of the data based on the data clusters. ● Explain how the Measures of Center summarize the data with a single number.	9.2 Mean 9.3 Measures of Center
6.DSP.A.2 6.DSP.A.3 6.DSP.B.5.b 6.DSP.B.5.c 6.DSP.B.5.d	The student will be able to find and interpret the range and interquartile range of a data set.	● I can explain how the range and interquartile range describe the variability of a data set with a single number. ● I can find the range and interquartile range of a	9.4 Measures of Variation

		data set. ● I can use the interquartile range to identify outliers.	
6.DSP.A.2 6.DSP.A.3 6.DSP.B.5.b 6.DSP.B.5.c 6.DSP.B.5.d	The student will find and interpret the mean absolute deviation of a data set.	● I can explain how the mean absolute deviation describes the variability of a data set with a single number. ● I can find the mean absolute deviation of a data set. ● I can compare data sets using the mean absolute deviation to draw conclusions.	9.5 Mean Absolute Deviation

Engaging Experience 2

Title: Suzi’s Company		Blocks: ½
Learning Target(s): ● I can write integers to represent quantities in real life. ● I can graph integers on a number line. ● I can find the opposite of an integer. ● I can apply integers to model real-life problems.	Success Criteria: ● I can explain how the mean absolute deviation describes the variability of a data set with a single number. ● I can find the mean absolute deviation of a data set. ● I can compare data sets using the mean absolute deviation to draw conclusions.	
Rich Task: ● Students will calculate and interpret mean, median and mode in a given table of realistic data from “Suzi’s” company, <i>TechScale</i>.	Instructional Suggestions: ● Have students work in pairs. ● Encourage students to calculate mean, median, and mode and interpret what each measure represents in context. ● Prompt students to compare measures and determine which best represents the data set. ● Facilitate discussion about how outliers impact measures of center.	
<u>Student Math Practices:</u> ●MP1 ●MP2 ●MP3 ●MP4 ●MP5 ●MP6 ●MP7 ●MP8		
Resources: ● ‘Suzi’s Company’		

Topic 3: Data Displays

<u>Cross-Cutting Terms:</u>		Grade-Specific Terms	
None		box-and-whisker plot five-number summary frequency frequency table	histogram leaf stem stem-and-leaf plot
Priority Standards & Supporting Standards	Learning Targets	Success Criteria	Aligned Sections from Course Resource
6.DSP.A.2 6.DSP.B.5.c 6.DSP.B.5.d	The student will display and interpret data in histograms The student will determine which measures of center and variation best describe a data set.	● I can explain how to choose histograms. ● I can make and interpret a histogram to describe the distribution of a data set. ● I can determine whether a question can be answered using a histogram. ● I can explain what it means for a distribution to be skewed left, skewed right, or symmetric. ● I can use data displays to describe shapes of distributions. ● I can use shapes of distributions to compare data sets.	10.2 Histograms
6.DSP.A.2 6.DSP.B.4.a 6.DSP.B.5.c 6.DSP.B.5.d	The student will determine which measures of center and variation best describe a data set.	● I can determine whether a question can be answered using a box and whisker plot. ● I can find the five-number summary of a data set. ● I can explain what it means for a distribution to be skewed left, skewed right, or symmetric. ● I can use data displays to describe shapes of distributions.	10.3 Shapes of Distribution 10.4 Choosing Appropriate Measures of Center

		● I can use the shape of a distribution to determine which measure of center best describes the data.	
	The student will display and interpret data in box and whisker plots. The student will determine which measures of center and variation best describe a data set.	I can make and interpret a box and whisker plot including quartiles and interquartile range. ● I can determine whether a question can be answered using a box and whisker plot. ● I can explain what it means for a distribution to be skewed left, skewed right, or symmetric. ● I can use data displays to describe shapes of distributions. ● I can use the shape of a distribution to determine which measure of center best describes the data.	10.5 Box and Whisker
6.DSP.A.2 <i>6.DSP.B.4.b</i>	The student will display and interpret data in circle graphs.	● I can explain how to draw a circle graph. ● I can make and interpret a circle graph. ● I can determine whether a question can be answered using a circle graph.	N/A

Engaging Experience 3

Title: Choosing a Dog		Blocks: ½
Learning Target(s): • The student will display and interpret data in histograms • The student will determine which measures of center and variation best describe a data set.	Success Criteria: • I can explain how to choose histograms. • I can make and interpret a histogram to describe the distribution of a data set. • I can determine whether a question can be answered using a histogram. • I can explain what it means for a distribution to be skewed left, skewed right, or symmetric. • I can use data displays to describe shapes of distributions. • I can use shapes of distributions to compare data sets.	
Rich Task: • Students will watch a video about choosing a dog and answer questions about the weights of the dogs represented in the stem-and-leaf plots. • Different animals grow at different rates. Given a group of puppies, students will describe an experiment that they can perform to compare their growth rates. Students will describe a real-life situation where knowing an animal’s growth rate can be useful.	Instructional Suggestions: • Encourage students to interpret stem-and-leaf plots and describe patterns in the data. • Prompt students to design and explain an experiment for comparing growth rates. • Ask students to connect mathematical analysis to real-world decision-making. • Facilitate discussion around how data can inform predictions and comparisons.	
<u>Student Math Practices:</u> •MP1 • MP2 •MP3 •MP4 •MP5 •MP6 •MP7 •MP8		
Resources: • <i>Big Ideas</i> pages 454 & 455, & video linked at the beginning of Chapter 10		

Topic 4: Area, Surface Area, & Volume

<u>Cross-Cutting Terms:</u>		Grade-Specific Terms	
composite figure		edge face kite net polygon polyhedron	prism pyramid solid surface area vertex (of a solid) volume
Priority Standards & Supporting Standards	Learning Targets	Success Criteria	Aligned Sections from Course Resource
6.GM.A.4.a 6.GM.A.4.b	The student will describe three-dimensional figures. The student will represent prisms using nets and use nets to find surface area of prisms.	- I can find the numbers of faces, edges, and vertices on 3-D figures to calculate surface area. - I can use nets to find surface areas of prisms. - I can use a formula to find the surface area of prisms. - I can apply surface areas of prisms to solve real-life problems.	7.4 Three Dimensional Figures 7.5 Surface Area of Prisms
6.GM.A.4.a 6.GM.A.4.b	The student will describe three-dimensional figures. The student will represent pyramids using nets and use nets to find surface areas of pyramids. The student will recognize the relationship between a three-dimensional figure and its two-dimensional net.	- I can find the numbers of faces, edges, and vertices on 3-D figures to calculate surface area. - I can represent 3 dimensional figures using nets made up of triangles and rectangles. - I can use nets to find surface areas of pyramids. - I can solve problems using nets.	7.4 Three Dimensional Figures 7.6 Surface Areas of Pyramids
6.GM.A.1 6.GM.A.2.a 6.GM.A.2.b	The student will find volumes and missing dimensions of rectangular prisms.	- I can use a formula to find the volume of a rectangular prism. - I can find the volume of a rectangular prism by filling the prism with multiple layers of	7.7 Volumes of Rectangular Prisms

		the base. ● I can use a formula to find the volume of a cube. ● I can use the volume of a rectangular prism and two of its dimensions to find the other dimension. ● I can apply volumes of rectangular prisms to solve real-life problems.	
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Engaging Experience 4

Title: Packaging Design		Blocks: ½
Learning Target(s): The student will find areas and missing dimensions of triangles and find areas of composite figures.	Success Criteria: I can use decomposition to find the area of a figure.	
Rich Task: - Using the STEAM Video from <i>Big Ideas</i>, pages 282-283, students will use surface area to determine the amount of paper necessary to form boxes of various sizes. - Students should also create their own paper box from a pre-printed template and determine the total surface area of the box.	Instructional Suggestions: - Take time to cue up the video before class. - Provide a foldable box net for each student to use/manipulate as they explore examples. - Have enough rulers on hand to allow students to quickly measure their boxes as they determine box surface area. - Encourage students to connect net representations to three-dimensional figures. - Prompt students to calculate and interpret surface area in the context of material use. - Ask students to justify how their calculations match their constructed model. - Support productive struggle as students reconcile differences between theoretical and actual measurements.	
Student Math Practices: - MP1 - MP2 - MP3 - MP4 - MP5 - MP6 - MP7 - MP8		
Resources: <i>Big Ideas</i> pages 282-283, a teacher-located box net that can be printed on letter or legal sized paper, scissors, rulers, and tape/glue sticks		

Engaging Experience 5

Title: Rectangle Perimeter		Blocks: ¼
Learning Target(s): ● The student will write equations in one variable and write equations that represent real-life problems.	Success Criteria: ● I can identify key words and phrases that indicate equality. ● I can write word sentences as equations. ● I can create equations to represent real life problems.	
Rich Task: ● To compute the perimeter of a rectangle you add the length, and width, and double this sum. ○ a. Write an expression for the perimeter of a rectangle. ○ b. Use the expression to find the perimeter of a rectangle with length 30 and width 75.	Instructional Suggestions: ● Encourage students to translate the verbal description into an algebraic expression. ● Prompt students to evaluate the expression and connect it to the geometric meaning of perimeter. ● Ask students to justify how their expression represents all sides of the rectangle. ● Facilitate discussion comparing different but equivalent expressions.	
<u>Student Math Practices:</u> ●MP1 ●MP2 ●MP3 ●MP4 ●MP5 ●MP6 ●MP7 ●MP8		
Resources: ● ‘Rectangle Perimeter 1’ from Illustrative Math		

Summary of Unit 4 Engaging Learning Experiences

Topic	Section	Experiences	Suggested Length of Time
1: Integers, Number Lines, & the Coordinate Plane	Integers & Compare/Order Integers	Big Ideas: 8.1 Integers 8.2 Comparing & Ordering Integers Engaging Experiences: 1: Above and Below Sea Level	1 block
	Rational Numbers	Big Ideas: 8.3 Rational Numbers	1 block
	Absolute Value, Coordinate Plane, and Polygons in the Coordinate Plane	Big Ideas: 8.4 Absolute Value 8.5 Coordinate Plane 8.6 Polygons in the Coordinate Plane 7.1 Area of Parallelograms 7.2 Area of Triangles	3 blocks
		Review/Flex Days	1 block
		Test Day	1 block
2: Statistical Measures	Introduce Statistics	Big Ideas: 9.1 Introduction to Statistics	1 block
	Mean Measures of Center	Big Ideas: 9.2 Mean 9.3 Measures of Center	1 block
	Measures of Variation	Big Ideas: 9.4 Measures of Variation Engaging Experiences: 2: Suzi's Company	1 block
	Mean Absolute Deviation	Big Ideas: 9.5 Mean Absolute Deviation	1 block
		Review/Flex Days	1 block

		Test Day	1 block
3: Data Displays	Histogram	Big Ideas: 10.2 Histograms Engaging Experiences: 3: Choosing a Dog	1 block
	Shapes of Distribution Choosing Appropriate Measures	Big Ideas: 10.3 Shapes of Distribution 10.4 Choosing Appropriate Measures	1 block
	Box & Whisker	Big Ideas: 10.5 Box & Whisker	1 block
		Review/Flex Days	1 block
		Test Day	1 block
4: Area, Surface Area, & Volume	Surface Area of Prisms	Big Ideas: 7.4 Three Dimensional Figures 7.5 Surface Area of Prisms	½ block
	Surface Area of Pyramids	Big Ideas: 7.4 Three Dimensional Figures 7.6 Surface Area of Pyramids Engaging Experiences: 4: Packaging Design 5: Rectangle Perimeter	1 ½ blocks
	Volume of Right, Rectangular Prisms	Big Ideas: 7.4 Three Dimensional Figures 7.7 Volume of Rectangular Prisms	1 block
		Review/Flex Days	1 block
		Test Day	1 block
Engaging Scenario: Students design and investigate a statistical question, analyzing and representing data to draw and justify conclusions with the Become a Data Analyst Project.			1 block

Use an end-of-unit exam as a summative assessment to assess unit skills.	
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Missouri Student Mathematical Practices

According to the Missouri Department of Elementary and Secondary Education (DESE) [guidance on Missouri Student Mathematical Practices](#), “it is important to emphasize not only the content contained in the standards presented but also the importance of mathematical practices for all students at all grade levels. If content standards are not implemented within a view of the mathematical processes/practices that should be developed by students, the ultimate impact on student mathematical power may be minimal. The following Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. They are consistent with the Show-Me process standards and these practices rest on important ‘processes and proficiencies’ with longstanding importance in mathematics education.”

A mathematically literate student can:

Mathematical Practice (MP)	Student Look-For's
Make sense of problems and persevere in solving them.	● Relate a problem to prior knowledge. ● Recognize that there may be multiple entry points to a problem and more than one path to a solution. ● Analyze what is given, what is not given, what is being asked, and what strategies are needed, and make an initial attempt to solve a problem. ● Evaluate the success of an approach to solve a problem and refine it if necessary. ● Evaluate the reasonableness of a solution to a problem.
Reason both contextually and abstractly.	● Make sense of quantities and their relationships in mathematical and real-world situations. ● Describe a given situation using multiple mathematical representations. ● Translate among multiple mathematical representations and compare the meanings each representation conveys about the situation. ● Connect the meaning of mathematical operations to the context of a given situation.

Use critical thinking skills to justify mathematical reasoning and critique the reasoning of others.	● Construct and justify a solution to a problem. ● Compare and discuss the validity of various reasoning strategies. ● Make conjectures and explore their validity. ● Reflect on and provide thoughtful responses to the reasoning of others.
Connect mathematical ideas and real-world situations through modeling.	● Identify relevant quantities and develop a model to describe their relationships. ● Interpret mathematical models in the context of the situation. ● Make assumptions and estimates to simplify complicated situations. ● Evaluate the reasonableness of a model and refine if necessary.
Use a variety of mathematical tools effectively and strategically.	● Select and use appropriate tools when solving a mathematical problem. ● Use technological tools and other external mathematical resources to explore and deepen understanding of concepts.
Communicate mathematically and approach mathematical situations with precision.	● Express numerical answers with the degree of precision appropriate for the context of a situation. ● Represent numbers in an appropriate form according to the context of the situation. ● Use appropriate and precise mathematical language. ● Use appropriate units, scales, and labels.
Identify and utilize structure and patterns.	● Recognize complex mathematical objects as being composed of more than one simple object. ● Recognize mathematical repetition in order to make generalizations. ● Look for structures to interpret meaning and develop solution strategies.
Look for and express regularity in repeated reasoning.	● Notice if calculations are repeated and look for generalizations in methods. ● Maintain oversight of the process while paying attention to the details. ● Draw general results from trying multiple examples.

National Council of Teachers of Mathematics’ (NCTM)

Effective Teaching Practices

According to NCTM’s *Principles to Actions: Ensuring Mathematical Success for All* (2014), the “eight mathematics teaching practices provide a framework for strengthening the teaching and learning of mathematics. This research-informed framework of teaching and learning...represent[s] a core set of high-leverage practices and essential teaching skills necessary to promote deep learning of mathematics” (p. 9).

Effective Mathematics Teaching Practices
Establish mathematics goals to focus learning. Effective teaching of mathematics establishes clear goals for the mathematics that students are learning, situates goals within learning progressions, and uses the goals to guide instructional decisions.
Implement tasks that promote reasoning and problem solving. Effective teaching of mathematics engages students in solving and discussing tasks that promote mathematical reasoning and problem solving and allow multiple entry points and varied solution strategies.
Use and connect mathematical representations. Effective teaching of mathematics engages students in making connections among mathematical representations to deepen understanding of mathematics concepts and procedures and as tools for problem solving.
Facilitate meaningful mathematical discourse. Effective teaching of mathematics facilitates discourse among students to build shared understanding of mathematical ideas by analyzing and comparing student approaches and arguments
Pose purposeful questions. Effective teaching of mathematics uses purposeful questions to assess and advance students’ reasoning and sense making about important mathematical ideas and relationships.
Build procedural fluency from conceptual understanding. Effective teaching of mathematics builds fluency with procedures on a foundation of conceptual understanding so that students, over time, become skillful in using procedures flexibly as they solve contextual and mathematical problems.
Support productive struggle in learning mathematics. Effective teaching of mathematics consistently provides students, individually and collectively, with opportunities and supports to engage in productive struggle as they grapple with mathematical ideas and relationships.
Elicit and use evidence of student thinking. Effective teaching of mathematics uses evidence of student thinking to assess progress toward mathematical understanding and to adjust instruction continually in ways that support and extend learning.

Shared Definitions for Cross-Cutting Term

Throughout their middle school mathematics learning experiences, students will encounter many new vocabulary terms to support their conceptual development—some of them are grade-level specific, and some of them are “cross-cutting terms,” or terms that they will encounter instruction on across multiple courses. In order to ensure systemic alignment and clarity of these cross-cutting terms, the following definitions have been provided:

Term	Definition	Location
absolute value	The distance between a number and 0 on a number line; The absolute value of a number a is written as $ a $.	6th Grade: Unit 4, Topic 1 7th Grade: Unit 1, Topic 1
addition property of equality	Adding the same number to each side of an equation, the two sides remain equal.	6th Grade: Unit 3, Topic 2 7th Grade: Unit 2, Topic 2 8th Grade: Unit 2, Topic 1
addition property of inequality	When you add the same number to each side of an inequality, the inequality remains true.	6th Grade: Unit 3, Topic 3 7th Grade: Unit 2, Topic 2 8th Grade: Unit 2, Topic 2
base (of a power)	The base of a power is the repeated factor.	6th Grade: Unit 1, Topic 1 7th Grade: Unit 6, Topic 1 8th Grade: Unit 4, topic 1
composite figure	A figure made up of triangles, squares, rectangles, and other two-dimensional figures.	6th Grade: Unit 4, Topic 1 7th Grade: Unit 5, Topic 1
division property of equality	When you divide each side of an equation by the same nonzero number, the two sides remain equal.	6th Grade: Unit 3, Topic 2 7th Grade: Unit 2, Topic 2 8th Grade: Unit 2, Topic 1
division property of inequality	When you divide each side of an inequality by the same positive number, the inequality remains true.	6th Grade: Unit 3, Topic 3 7th Grade: Unit 2, Topic 2 8th Grade: Unit 2, Topic 2
equivalent equations	Equations that have the same solutions.	7th Grade: Unit 2, Topic 2 8th Grade: Unit 2, Topic 1

equivalent rates	Rates that have the same unit rate.	6th Grade: Unit 2, Topic 1 7th Grade: Unit 3, Topic 1
equivalent ratios	Two ratios that describe the same relationship.	6th Grade: Unit 2, Topic 1 7th Grade: Unit 3, Topic 1
evaluate	Calculate a numerical result- sometimes by substituting given values	6th Grade: Unit 1, Topic 1 7th Grade: Unit 1, Topic 1 8th Grade: Unit 3, Topic 1
exponent	The exponent indicates the number of times the base is used as a factor.	6th Grade: Unit 1, Topic 1 7th Grade: Unit 2, Topic 1 8th Grade: Unit 4, Topic 1
factoring an expression	Writing a numerical expression or algebraic expression as a product of factors.	6th Grade: Unit 3, Topic 1 7th Grade: Unit 2, Topic 1
graph of an inequality	A graph that shows all the solutions of an inequality on a number line.	6th Grade: Unit 3, Topic 3 7th Grade: Unit 2, Topic 3 8th Grade: Unit 2, Topic 2
integers	The set of whole numbers and their opposites.	6th Grade: Unit 4, Topic 1 7th Grade: Unit 1, Topic 1 8th Grade: Unit 1, Topic 1
like terms	Terms of an algebraic expression that have the same variables raised to the same exponents.	6th Grade: Unit 3, Topic 1 7th Grade: Unit 2, Topic 1 8th Grade: Unit 2, Topic 1
multiplication property of equality	When you multiply each side of an equation by the same nonzero number, the two sides remain equal.	6th Grade: Unit 3, Topic 2 7th Grade: Unit 2, Topic 2 8th Grade: Unit 2, Topic 1
multiplication property of inequality	When you multiply each side of an inequality by the same positive number, the inequality remains true.	6th Grade: Unit 2, Topic 3 7th Grade: Unit 2, Topic 3 8th Grade: Unit 2, Topic 2

power	The result of multiplying a number by itself a certain number of times.	6th Grade: Unit 1, Topic 1 7th Grade: Unit 6, Topic 1 8th Grade: Unit 4, Topic 1
rate	A ratio of two quantities using different units.	6th Grade: Unit 2, Topic 1 7th Grade: Unit 3, Topic 1 8th Grade: Unit 3, Topic 1
ratio	A comparison of two quantities; The ratio of a to b can be written as $a : b$.	6th Grade: Unit 2, Topic 1 7th Grade: Unit 3, Topic 1
ratio table	A table used to find and organize equivalent ratios.	6th Grade: Unit 2, Topic 1 7th Grade: Unit 3, Topic 1 8th Grade: Unit 3, Topic 1
rational number	A number that can be written as $\frac{a}{b}$ where a and b are integers and $b \neq 0$.	6th Grade: Unit 4, Topic 1 7th Grade: Unit 1, Topic 1 8th Grade: Unit 4, Topic 2
simplify	Rewrite an expression in an equivalent, simpler form, with no unnecessary parts.	7th Grade: Unit 1, Topic 1 8th Grade: Unit 2, Topic 1
solution of an inequality	The value of values that makes an inequality true.	6th Grade: Unit 3, Topic 3 7th Grade: Unit 2, Topic 3 8th Grade: Unit 2, Topic 2
solution set	The set of all solutions of an inequality.	6th Grade: Unit 3, Topic 3 7th Grade: Unit 2, Topic 3 8th Grade: Unit 2, Topic 2
solve	Find the value(s) that make an equation or inequality true.	7th Grade: Unit 2, Topic 2 8th Grade: Unit 2, Topic 1
substitute	Replace a variable with a given value or expression.	6th Grade: Unit 3, Topic 1 7th Grade: Unit 2, Topic 1 8th Grade: Unit 2, Topic 1

subtraction property of equality	When you subtract the same number from each side of an equation, the two sides remain equal.	6th Grade: Unit 3, Topic 2 7th Grade: Unit 2, Topic 2 8th Grade: Unit 2, Topic 1
subtraction property of inequality	When you subtract the same number from each side of an inequality, the inequality remains true.	6th Grade: Unit 3, Topic 3 7th Grade: Unit 2, Topic 3 8th Grade: Unit 2, Topic 2
U.S. customary system	A system of measurement that contains units for length, capacity, and weight.	6th Grade: Unit 2, Topic 1 7th Grade: Unit 3, Topic 1
unit rate	A rate that compares a quantity to one unit of another quantity using division.	6th Grade: Unit 2, Topic 1 7th Grade: Unit 3, Topic 1 8th Grade: Unit 3, Topic 1
value of a ratio	The number $\frac{a}{b}$ associated with the ratio a : b. The value of a ratio describes the multiplicative relationship between the quantities in a ratio.	6th Grade: Unit 2, Topic 11. 7th Grade: Unit 3, Topic 1 8th Grade: Unit 4, Topic 2

[Flashcards linked here.](#)

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.