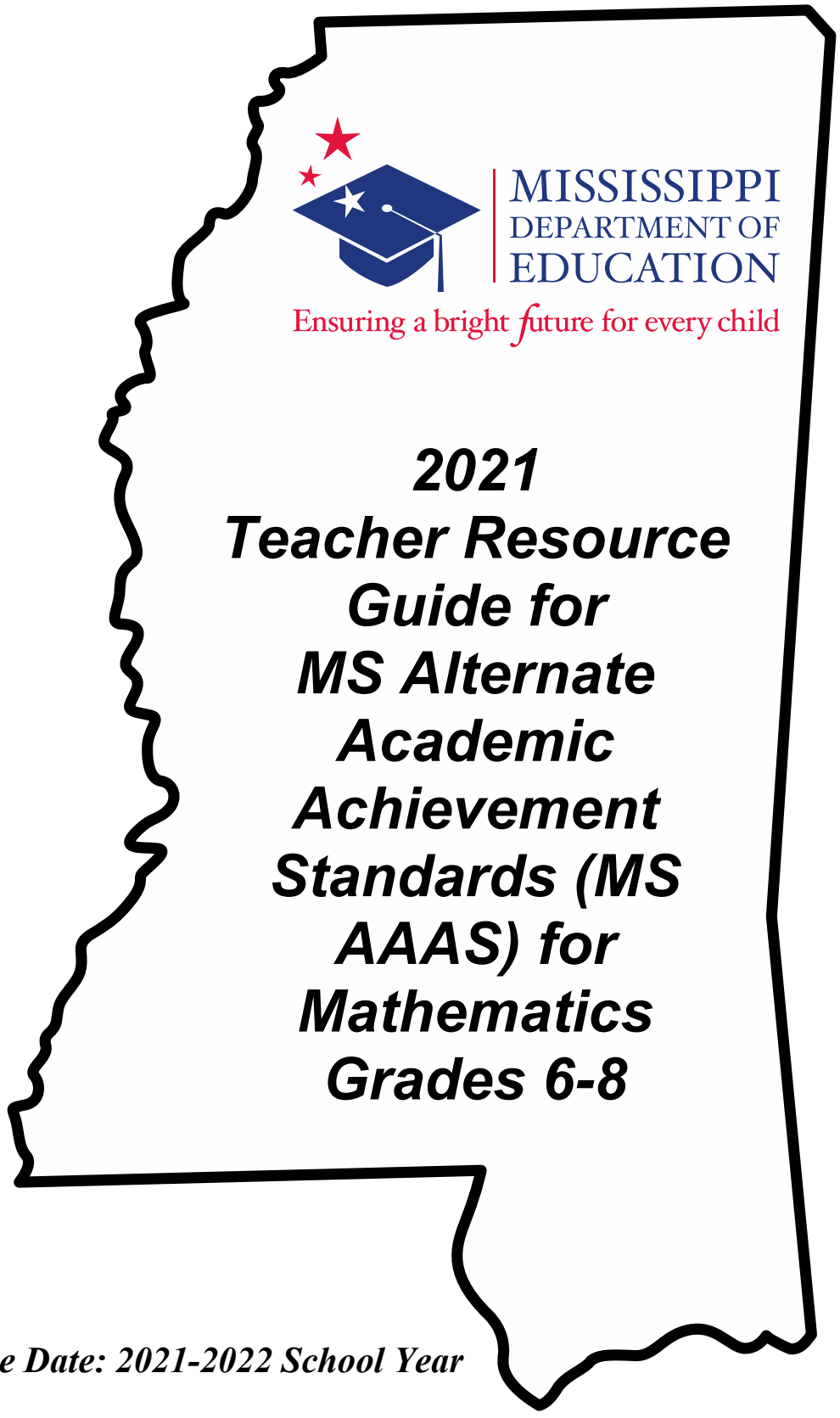

MISSISSIPPI DEPARTMENT OF EDUCATION

Ensuring a bright future for every child

2021 Teacher Resource Guide for MS Alternate Academic Achievement Standards (MS AAAS) for Mathematics Grades 6-8

Effective Date: 2021-2022 School Year

2021
Teacher Resource Guide for MS AAAS for Grades 6-8 Mathematics

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Acknowledgements

The Mississippi Department of Education gratefully acknowledges the hard work of the following individuals for their involvement in developing the *Teacher Resource Guide for MS AAAS for Grades 6-8 Mathematics*.

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The Standards

The *2020 Mississippi Alternate Academic Achievement Standards for Grades 6-8 Mathematics* is comprised of six conceptual categories: number and quantity, algebra, functions, modeling, geometry, and statistics and probability. The different categories combine to provide a broad scope of the study of mathematics.

Remaining Material in the Teacher Resource Guide

The remaining materials in the teacher resource guide (performance objectives, real world connections, vocabulary, and resources) were developed through a collaboration of Mississippi teachers, administrators, the Mississippi Department of Education (MDE) Office of Special Education staff, and the Mississippi State University Research and Curriculum Unit staff.

Introduction

The MDE is dedicated to student success, improving student achievement in mathematics and establishing communication skills within a technological environment. The *Mississippi Alternate Academic Achievement Standards* (MS AAAS) provide a consistent, clear understanding of what students are expected to know and be able to do by the end of each grade level or course. The purpose of the Alternate Standards is to build a bridge from the content in the general education mathematics framework to academic expectations for students with the most significant cognitive disabilities. The standards are designed to be rigorous and relevant to the real world, reflecting the knowledge and skills that students need for success in postsecondary settings.

Purpose

In an effort to closely align instruction for students with significant cognitive disabilities who are progressing toward postsecondary settings, the *MS AAAS for Mathematics Grades 6-8* includes course-specific standards for mathematics. This document is designed to provide a resource for kindergarten through eighth grade special education teachers with a basis for curriculum development and instructional delivery.

The *Teacher Resource Guide for Mathematics Grades 6-8* contains prioritized content, which is presented as a matrix to show the continuum of the concept across complexity levels. The matrix shows varying access points to the prioritized content. A student's progression through content contained in the matrix is intended to be fluid. It is not the intent, nor should it be practice, for a student to be exposed to content in a straight vertical line through one of the columns. Every student, regardless of disability, comes to the learning environment with a different set of prior knowledge and experience. For this reason, a student may be able to access some content from the middle complexity level and access other concepts at the more complex level. Teachers should evaluate a student's ability in relation to the content and select the entry point based on that evaluation. Students should not be locked into receiving exposure to all content at the same entry point.

Support Documents and Resources

The MDE Office of Special Education aims to provide local districts, schools, and teachers supporting documents to construct standards-based instruction and lessons, allowing them to customize content and delivery methods to fit each student's needs. The teacher resource guide includes suggested resources, instructional strategies, sample lessons, and activities. Additional sample activities and resources for selected standards may be added; this shall be a living document with ongoing updates based on educator feedback. The intent of these resources is to assist teachers in linking their instruction to the prioritized content. The teacher resource guide includes activity adaptations for students with a varying range of abilities within the classroom. The activities and adaptations provided are intended to serve as a model of how students participating in the Mississippi Academic Assessment Program-Alternate (MAAP-A) may receive academic instruction in mathematics. There are many ways in which skills and concepts can be incorporated based on students individual learning styles and needs. Professional development efforts are aligned to the *MS AAAS for Mathematics Grades 6-8* and delivered in accord with teacher resources to help expand expertise in delivering student-centered lessons.

Structure of the Teacher Resource Guide for MS AAAS for Mathematics Grades 6-8

MS AAAS for Mathematics Grades 6-8: A general statement of what students with significant cognitive disabilities should know and be able to do because of instruction. This guide includes statements that describe in precise, measurable terms what learners will be able to do at the end of an instructional sequence; ways educators can link theory to real world activities; focused vocabulary banks; and additional teaching resources.

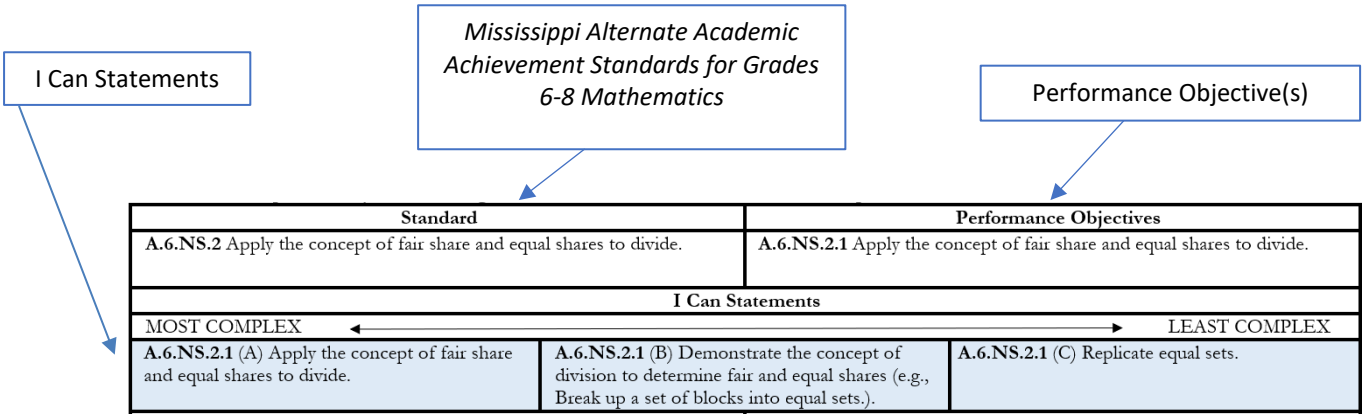
- I Can Statement(s): These statements include the Performance Objective(s) as the *Most Complex* and scaffolds the performance objectives two additional levels (B) and (C) to *Least Complex*. This matrix demonstrates the continuum of the concept across complexity levels. The purpose is to assist teachers in modifying to meet the unique diverse needs of learners with significant cognitive disabilities.

- Real World Connections: These items help facilitate learning that is meaningful to students and prepares them for their professional lives outside of school. When teachers move beyond textbook or curricular examples and connect content learned in the classroom to real people, places, and events, students can see a greater relevance to their learning. Real world connections are used to help students see that learning is not confined to the school, allow them to apply knowledge and skills in real world situations, and personalize learning to increase and sustain student engagement.

- Vocabulary: These lists include difficult or unfamiliar words students need to know and understand.

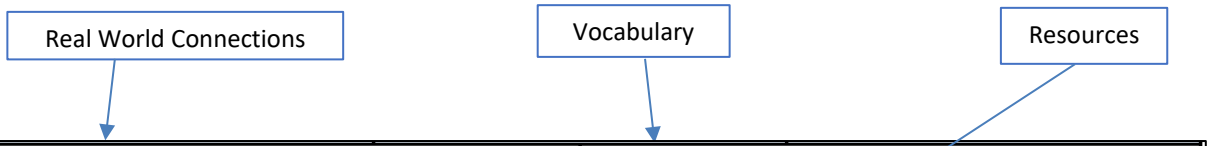
- Resources: These resources include instructional strategies, lessons, and activities. Additional sample activities and resources for selected standards may be added; this shall be a living document with ongoing updates based on educator feedback. The intent of these activities is to assist teachers in linking their instruction to the prioritized content.

Teacher Resource Guide for Mathematics Grades 6-8 (Graphic)



Standard	Performance Objectives
A.6.NS.2 Apply the concept of fair share and equal shares to divide.	**A.6.NS.2.1** Apply the concept of fair share and equal shares to divide.

I Can Statements		
MOST COMPLEX ←		→ LEAST COMPLEX
A.6.NS.2.1 (A) Apply the concept of fair share and equal shares to divide.	**A.6.NS.2.1** (B) Demonstrate the concept of division to determine fair and equal shares (e.g., Break up a set of blocks into equal sets.).	**A.6.NS.2.1** (C) Replicate equal sets.



Real World Connections:

- Determine equal shares.
- Prepare recipes.
- Divide work tasks equally between class members.
- Create a budget.
- Determine unit price.

Vocabulary

- Divide
- Dividend
- Division
- Divisor
- Equal
- Quotient
- Separate
- Sets
- Subsets
- Subtract

Resources:

- **Websites, articles, and other collections**
  - Toy Theater | Educational Games for Kids
    - Fraction Virtual Manipulatives
  - Khan Academy (khanacademy.org)
    - Intro to Division
  - NRICH Maths at Home (nrich.maths.org)
    - Share Bears
  - Math Tech Connections Inc. (mathtechconnections.com)
    - Division Strategies: Introducing Division to Third Graders
- **Activities**
  - Represent repeated subtraction with a model or manipulatives.
  - Use manipulatives such as sorting trays, counters, cubes, or color tiles.
  - Teach students how to use a calculator to solve division problems.
- **Videos**
  - Math Songs by NUMBEROCK (YouTube)
    - Division Song for Kids | Division as Repeated Subtraction | 3rd Grade-4th Grade
  - Icon Math (YouTube)
    - Division Using Repeated Subtraction

Levels of Support (LOS)

Students with significant cognitive disabilities require varying LOS to engage in academic content. The goal is to move the student along the continuum of assistance toward independence by decreasing the LOS provided and increasing student accuracy within the context of content to demonstrate progress.

The following chart describes the continuum of LOS. Appropriate LOS are important to increase student engagement and student independence and to track student achievement and progress.

Level of Assistance	Definition	Example	Non-Example
Non-Engagement (N)	The student requires assistance from the teacher to initiate, engage, or perform; however, the student actively refuses or is unable to accept teacher assistance.	The student resists the teacher's physical assistance toward the correct answer.	The student does not look at the activity.
Physical Assistance (P)	The student requires physical contact from the teacher to initiate, engage, or perform.	The teacher physically moves the student's hand to the correct answer.	The teacher taps the correct answer and expects the student to touch where he/she tapped.
Gestural Assistance (G)	The student requires the teacher to point to the specific answer.	When presenting a choice of three pictures and asking the student which picture is a triangle, the teacher will point to or tap on the correct picture to prompt the student to indicate that picture.	The teacher moves the student's hand to gesture toward the right answer.
Verbal Assistance (V)	The student requires the teacher to verbally provide the correct answer to a specific item.	The teacher says, "Remember, the main character was George. Point to the picture of the main character."	The teacher says, "Who is the main character?" without providing the information verbally.
Model Assistance (M)	The student requires the teacher to model a similar problem/opportunity and answer prior to performance.	The teacher models one-to-one correspondence using manipulatives and then asks the student to perform a similar item.	The teacher completes the exact same activity as the student is expected to perform.
Independent (I)	The student requires no assistance to initiate, engage, or perform. The student may still require other supports and accommodations to meaningfully engage in the content but does not require assistance to participate and respond.	The teacher asks the student, "Who is the main character of the book?" and the student meaningfully responds without any prompting or assistance.	The teacher asks the student, "Who is the main character?" and points to the picture of the main character.

COURSE: Alternate Mathematics 6th Grade
DOMAIN: Ratios and Proportional Relationships (RP)
CLUSTER: Understand ratio concepts and use ratio reasoning to solve problems

Standard	Performance Objectives
A.6.RP.1 Demonstrate a simple ratio relationship.	**A.6.RP.1.1** Demonstrate a simple ratio relationship (i.e., The ratio of wings to beaks in the birdhouse in the zoo was 2 to 1.).

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.6.RP.1.1 (A) Demonstrate a simple ratio relationship (i.e., The ratio of wings to beaks in the birdhouse in the zoo was 2 to 1.).	**A.6.RP.1.1** (B) Match pictures to corresponding simple ratios.	**A.6.RP.1.1** (C) Identify a one-to-one ratio.

Real World Connections:

- Compare unit rates when shopping.
- Cook a double batch of cookies.
- Decide how much is needed to paint a house.
- Make a scale model.

Vocabulary

- Compare
- Part
- Part-to-part
- Part-to-whole
- Ratio
- Whole

Resources:

- **Websites, articles, and other collections**
  - Teaching Channel (learn.teachingchannel.com)
    - Introduction to Ratios & Proportional Relationships
  - Khan Academy (khanacademy.org)
    - Unit: Ratios, Rates, & Percentages
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Ratios
  - MathGames by TeachMe (Mathgames.com)
    - Ratios
- **Activities**
  - Use manipulatives to act out problems such as: "There are 15 cookies and three children. How many cookies are there for each child?"
  - Give students a ratio with two different types of counters or manipulatives for each ratio unit (e.g., 2:6 would be represented with two coins and six bear counters). Then have students create the same ratio with two different types of counters (e.g., two token chips and six cubes). Provide students with response options or AAC device with options programmed.
  - For students approaching least complexity, rather than using numbers to represent simple ratios, have students indicate proportional relations by stating same or not the same.
  - Use high-interest items that demonstrate a constant ratio, such as a favorite car (four wheels to one car) or favorite pet (2 ears on one head).
  - Consider a tangible token economy system which follows a ratio (e.g., For every three tokens, Mike earns five minutes of time listening to his music.).

- Provide a ratio and ask the students to use unit blocks to show the ratio (e.g., the ratio of girls to boys in our class is 3:2. Use the unit blocks to show the ratio of girls to boys.).

- **Videos**
  - YouTube by WCLN
    - WCLN—Introduction to Ratios
  - YouTube by Marion Nino-espino
    - BrainPOP—Ratios
  - YouTube by Eric Buffington
    - Ratios (Simplifying Math)

No alternate standard for 6.RP.2-3

COURSE: Alternate Mathematics 6th Grade
DOMAIN: The Number System (NS)
CLUSTER: Apply and extend previous understandings of multiplication and division to divide fractions by fractions

Standard	Performance Objectives
A.6.NS.1 Compare the relationships between two unit fractions.	**A.6.NS.1.1** Compare the relationships between two unit fractions.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.6.NS.1.1 (A) Compare the relationships between two unit fractions.	**A.6.NS.1.1** (B) Match two-digit fractions to the corresponding picture representation.	**A.6.NS.1.1** (C) Match two unit fractions that are the same.

Real World Connections:

- Read recipes.
- Share with others.
- Weigh produce at the grocery store.
- Measure items.
- Purchase the correct amount of food (e.g., gallon vs. half gallon of milk).

Vocabulary

- Denominator
- Equal
- Equivalent
- Fraction
- Greater than
- Less than
- Number line
- Numerator
- Part
- Whole

Resources:

- **Websites, articles, and other collections**
  - Math is Fun!
    - Fractions!
    - Cooking Measurements
  - Dudamath (dudamath.com)
    - Dudamath (an integrated environment for interactive exploration of mathematical concepts and problem solving)
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - Fraction Games
  - Khan Academy (khanacademy.org)
    - Understanding Fractions
  - Larson Mathematical Practices (mathematicalpractices.com)
    - Printable Manipulatives
  - Didax, Inc. (didax.com)
    - Virtual Manipulatives for Math
  - The Math Learning Center (mathlearningcenter.org)
    - Fractions for iPad, Web, and Chrome
- **Activities**
  - Use manipulatives such as Cuisenaire Rods, fraction bars, fraction circles, color tiles, geoboards, and building blocks.
  - Use a number line to determine if the fractions are greater than, less than, or equal to each other based on their location.
  - Prepare a simple recipe using fractions to measure ingredients and divide servings equally.

- Use a pizza circle with unit fractions written on them.

- **Videos**
  - YouTube by Math Songs by NUMBEROCK
    - Fractions Song for Kids | 2nd Grade-3rd Grade
  - YouTube by Kids Learning Videos
    - Let's Learn Fractions = Understanding Math for Kids
  - YouTube by Math Songs by NUMBEROCK
    - Fractions on a Line Plot | 4th and 5th Grade
  - YouTube by McReams and a Side of Fries
    - Fractions—BrainPOP
  - YouTube by Alex Lochoff
    - Understanding Fractions Word Problems
  - YouTube by Math & Learning Videos 4 Kids
    - Comparing Fractions—3rd Grade Mathematics Video for Kids

COURSE: Alternate Mathematics 6th Grade
DOMAIN: The Number System (NS)
CLUSTER: Compute fluently with multi-digit numbers and find common factors and multiples

Standard	Performance Objectives
A.6.NS.2 Apply the concept of fair share and equal shares to divide.	**A.6.NS.2.1** Apply the concept of fair share and equal shares to divide.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.6.NS.2.1 (A) Apply the concept of fair share and equal shares to divide.	**A.6.NS.2.1** (B) Demonstrate the concept of division to determine fair and equal shares (e.g., Break up a set of blocks into equal sets.).	**A.6.NS.2.1** (C) Replicate equal sets.

Real World Connections:

- Determine equal shares.
- Prepare recipes.
- Divide work tasks equally between class members.
- Create a budget.
- Determine unit price.

Vocabulary

- Divide
- Dividend
- Division
- Divisor
- Equal
- Quotient
- Separate
- Sets
- Subsets
- Subtract

Resources:

- **Websites, articles, and other collections**
  - Toy Theater | Educational Games for Kids
    - Fraction Virtual Manipulatives
  - Khan Academy (khanacademy.org)
    - Intro to Division
  - NRICH Maths at Home (nrich.maths.org)
    - Share Bears
  - Math Tech Connections Inc. (mathtechconnections.com)
    - Division Strategies: Introducing Division to Third Graders
- **Activities**
  - Represent repeated subtraction with a model or manipulatives.
  - Use manipulatives such as sorting trays, counters, cubes, or color tiles.
  - Teach students how to use a calculator to solve division problems.
- **Videos**
  - YouTube by Math Songs by NUMBEROCK
    - Division Song for Kids | Division as Repeated Subtraction | 3rd Grade-4th Grade
  - YouTube by Icon Math
    - Division Using Repeated Subtraction

- YouTube by Kiersten Rutherford
  - Repeated Subtraction—BrainPOP Jr.
- YouTube by Fred Muraview
  - BrainPopJR Making Equal Groups

COURSE: Alternate Mathematics 6th Grade
DOMAIN: The Number System (NS)
CLUSTER: Compute fluently with multi-digit numbers and find common factors and multiples

Standard	Performance Objectives
A.6.NS.3 Solve two-factor multiplication problems with products up to 50 using concrete objects and/or a calculator.	**A.6.NS.3.1** Solve two-factor multiplication problems with products up to 50 using concrete objects and/or a calculator.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.6.NS.3.1 (A) Solve two-factor multiplication problems with products up to 50 using concrete objects and/or a calculator.	**A.6.NS.3.1** (A) Solve two-factor multiplication problems with products up to 30 using concrete objects and/or a calculator.	**A.6.NS.3.1** (A) Using a graphic organizer, identify the two factors (e.g., the number of groups and the number in each group).

Real World Connections:

- Convert measurements in recipes.
- Determine how much to tip at a restaurant.
- Calculate the area of a square or rectangle.
- Plan a trip (e.g., hotel cost per day).

Vocabulary

- Array
- Factor
- Multiply
- Product
- Repeated addition
- Times

Resources:

- **Websites, articles, and other collections**
  - The Teach Company 2018 Maze Media Ltd. (teachwire.net)
    - Teaching Times Tables with Real-World Examples
    - 12 of the Best Times Table Resources and Games for Primary Maths
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Multiplication Examples in the World Around You
    - 3 Foolproof Ways to Teach Multiplication for the Best Results
  - Khan Academy (Khanacademy.org)
    - Understand Equal Groups as Multiplication
    - Relate Repeated Addition to Multiplication
  - LearnZillion (learnzillion.com)
    - Use repeated addition to find the total number of objects in an array.
- **Activities**
  - Use a pictorial array to count the rows and make groups.
  - Double or triple a simple recipe and prepare.
  - Use times tables and calculators to solve multiplication problems.
  - Use manipulatives such as a raised grid array, graph paper, counters, colored tiles, number line, base-10 blocks, and five and 10 frames.
  - Find the number of objects in equal groups using skip counting and repeated addition, then multiply to find the total number in all the equal groups.

- Show a picture of puppies and try to figure out how many puppies there are by just counting the puppies. Then group the puppies into equal groupings and count the groupings to help figure out the total number of puppies.

- **Videos**
  - Khan Academy (khanacademy.org)
    - Multiplication as Equal Groups
    - Basic Multiplication
  - YouTube by Rock 'N Learn
    - What is Multiplication? | Multiplication Concepts for Kids
  - YouTube by Ashley Forrester
    - Arrays—BrainPOP
  - YouTube by SpeedyMind
    - Multiplication as Repeated Addition | Multiplication for Kids
  - TeacherTube by Salem Media Group, Inc. (teachertube.com)
    - Multiplication with Touchpoints
    - Multiplication with Base-10 Blocks

No alternate standard for 6.NS.4

COURSE: Alternate Mathematics 6th Grade
DOMAIN: The Number System (NS)
CLUSTER: Apply and extend previous understandings of numbers to the system of rational numbers

Standard	Performance Objectives
A.6.NS.5-8 Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero).	**A.6.NS.5-8.1** Demonstrate that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero).

I Can Statements

MOST COMPLEX ⟵ ⟶ LEAST COMPLEX

A.6.NS.5-8.1 (A) Demonstrate that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero).	**A.6.NS.5-8.1** (A) Locate negative integer numbers on a number line.	**A.6.NS.5-8.1** (A) Select positive numbers on a number line.

Real World Connections:

- Read temperature on a thermometer.
- Use credit and debit.
- Explore supply and demand.
- Count calories.

Vocabulary

- Integer
- Less
- More
- Negative number
- Number line
- Opposite
- Positive number
- Same
- Zero

Resources:

- **Websites, articles, and other collections**
  - Illustrative Mathematics, Kendall Hunt Publishing Company (IM.kendallhunt.com)
    - Lesson 1 Positive and Negative Numbers
    - Hot Air Balloon Integers
  - Khan Academy.org (khanacademy.org)
    - Intro to Negative Numbers
    - Negative Numbers on the Number Line
  - Super Teacher Worksheets (superteacherworksheets.com
    - Integers
  - The Math Learning Center (mathlearningcenter.org)
    - Number Line for iPad, Web, and More
- **Activities**
  - Use a number line -99 to +99 to show the point of origin is zero. Then allow them to walk the line to order numbers.
  - Use visual templates with vertical and horizontal number lines with pictures (e.g., above and below sea level, thermometer, tug of war).
  - Use manipulatives such as colored number lines (e.g., red numbers for negative, green numbers for positive), raised or textured number lines, a thermometer for weather, and virtual manipulatives.

- **Videos**
  - YouTube by GCFLearnFree.org
    - Negative Numbers: An Overview
  - YouTube by Math Songs by NUMBEROCK
    - Integers Song: With Introduction to Absolute Value
  - YouTube by EZ The EasyWayTo
    - Teaching Positive and Negative Numbers: Greater Than/Less Than/Equal to

COURSE: Alternate Mathematics 6th Grade
DOMAIN: Expressions and Equations (EE)
CLUSTER: Apply and extend previous understandings of arithmetic to algebraic expressions

Standard	Performance Objectives
A.6.EE.1-2 Identify equivalent number sentences.	**A.6.EE.1-2.1** Identify equivalent number sentences.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.6.EE.1-2.1 (A) Identify equivalent number sentences.	**A.6.EE.1-2.1** (B) Match number sentences with given equal sums.	**A.6.EE.1-2.1** (C) Identify a number sentence.

Real World Connections:

- When shopping, compare prices (e.g., one for $2.50 or two for $5).
- Use a number sentence to express the score of a football game.

Vocabulary

- Addition
- Equal
- Equation
- Equivalent
- Number sentence
- Subtraction

Resources:

- **Websites, articles, and other collections**
  - Study.com (study.com)
    - Arithmetic Sequences: Definition & Finding the Common Difference
  - Colorado Department of Education (cde.state.co.us)
    - Word Problems—Research and Practice Guide
  - Study.com (study.com)
    - Equivalent Number Sentences Activities
- **Activities**
  - Create sets of cards with expressions written on them. The cards should be able to be sorted into pairs of equivalent expressions, such as 4+5 and 81÷9. Divide the class into teams and have each team stand near a wall. Give each team a set of the cards you created and tape. Say "Go." One member of the team lightly throws the cards in the air so they fall to the floor near the team. Team members should then find pairs of expressions that can be used to create an equivalent number sentence. When the team finds a match, they should tape the pair of cards next to each other on the wall. Once each team is finished, have the students read aloud their equivalent number sentences.
  - Use in and out boxes to find the rule.
  - Given a two-step word problem, identify the numerical equivalent (e.g., "Jean has three apples, and Bill has two. Tony ate one apple. How many apples are left?" Students produces the math sentence 3+2–1= or 2–1+3=.).
  - Given a picture showing single addition, identify the correct number sentence.
  - Given picture representations of two equal groups of objects with an equal sign between, students should respond that they are the same.
- **Videos**
  - Study.com (study.com)
    - Equivalent Sets: Definition & Example
  - YouTube by Mathademics
    - Number Sentences

- YouTube by Miacademy Learning Channel
  - How to Write a Number Sentence or Equation
- YouTube by Susan Burke
  - Equivalent Number Sentences
- NUMBEROCK (numberock.com)
  - Number Sentences by NUMBEROCK
- YouTube by MatholiaChannel
  - Number Sentences

COURSE: Alternate Mathematics 6th Grade
DOMAIN: Expressions and Equations (EE)
CLUSTER: Apply and extend previous understandings of arithmetic to algebraic expressions

Standard	Performance Objectives
A.6.EE.3 Apply the properties of addition to identify equivalent numerical expressions.	**A.6.EE.3.1** Apply the properties of addition to identify equivalent numerical expressions (e.g., 2+3=3+2, 4+3=3+4, etc.)

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.6.EE.3.1 (A) Apply the properties of addition to identify equivalent numerical expressions (e.g., 2+3=3+2, 4+3=3+4, etc.).	**A.6.EE.3.1** (B) Match pictures to an equivalent number sentence.	**A.6.EE.3.1** (C) Match pictures that show equal quantities.

Real World Connections:

- Represent the area of a diagram using numerical expressions.
- Create an addition sentence from total pages of a book read.
- Create a sketch that has total number in class represented by boys and girls.

Vocabulary

- Addition
- Expression
- Equal
- Equivalent

Resources:

- **Websites, articles, and other collections**
  - Better Lesson (betterlesson.com)
    - Working with the Properties!
    - Equivalent Numerical Expressions, Day 2 of 2
  - Math Geek Mama (mathgeekmama.com)
    - Equivalent Expressions Activity (FREE)
  - New Mexico Public Education Department (webnew.ped.state.nm.us)
    - 6.EE: Expressions & Equations
  - Delaware Department of Education (doe.k12.de.us)
    - Grade 6 Expressions & Equations Sample Unit Plan
- **Activities**
  - Solve equivalent expressions to illustrate that they are equivalent (e.g., Fill in the blank to make a true statement: 2+6=6+___. Fill in the blank to make a true statement: 3+5=___+3. Fill in the blank to make a true statement: 4+___=3+4, etc.).
  - Given a model, create an expression using manipulatives (e.g., Three blocks plus two blocks equals five blocks.).
  - Match pictures of quantities of objects to their numerical equivalent (e.g., Four balls match to the number 4.).
  - Given a group of three objects, a group of four objects, and a group of seven objects, match to 3+4=7
  - Indicate that 2+3 is the same as 3+2. Answer yes or no when asked, "Is 2+3 equal to 3+2?" Answer yes or no when asked, "Is 2+3 equal to 4+2?"
- **Videos**
  - Mississippi Public Broadcasting Learning Media (mpb.pbslearningmedia.org)
    - Equivalent Expressions with the Distributive Property

- Commutative and Associative Properties of Addition
- YouTube by Planet Nutshell
  - Math Shorts Episode 6—Equivalent Expressions with the Distributive Property
- Khan Academy (khanacademy.org)
  - Equivalent Expressions

No alternate standard for 6.EE.4

COURSE: Alternate Mathematics 6th Grade
DOMAIN: Expressions and Equations (EE)
CLUSTER: Reason about and solve one-variable equations and inequalities

Standard	Performance Objectives
A.6.EE.5-8 Match an equation to a real-world problem in which variables are used to represent numbers.	**A.6.EE.5-8.1** Match an equation to a real-world problem in which variables are used to represent numbers.

I Can Statements

MOST COMPLEX ⟵ ⟶ LEAST COMPLEX

A.6.EE.5-8.1 (A) Match an equation to a real-world problem in which variables are used to represent numbers.	**A.6.EE.5-8.1** (B) Determine what is unknown in a word problem.	**A.6.EE.5-8.1** (C) Select the unknown/letter in a mathematical sentence.

Real World Connections:

- Convert a word problem into an equation using variables.
- Figure out income (allowance) over time.
- Figure the length of your hair after you go to hair salon and get 2 in. cut off.
- Calculate mileage rate.
- Predict profit from sales.
- Participate in a fitness competition wearing a fitness tracker to keep track of how many steps you take each day. Write an equation with variables to determine the average daily step total for the challenge.

Vocabulary

- Equation
- Mathematical sentence
- Represent
- Unknown
- Variable
- Word problem

Resources:

- **Websites, articles, and other collections**
  - Math Worksheets Land (mathworksheetsland.com)
    - Using Variables to Represent Numbers
  - Math Idea Galaxy (ideagalaxyteacher.com)
    - 9 Magical Activities for Real-World Equations Problems
  - HomeSchoolMath.net (homeschoolmath.net)
    - How to Set Up Algebraic Equations to Match Word Problems
  - CK-12 Foundation(ck12.org)
    - 1.12 Solve Real-World Problems by Writing and Solving Single-Variable Equations
    - 1.6 Expressions for Real-Life Situations
  - Better Lesson (betterlesson.com)
    - Writing Algebraic Equations to Represent Real-World Scenarios (One-Step)

- Class Ace (Classace.io)
  - How to Write Word Problems as Equations with Variables
- **Activities**
  - Use task cards, having students work on them independently, with partners, or as a whole-class activity. Make sure to print the answers on the back so students can get immediate feedback.
  - You need to read two books over vacation. You do not have the books yet, so you are not sure how many pages are in each book. You do not want to wait until the last minute to read the books, so you are planning to read the same number of pages each day of vacation. If your summer vacation is 10 days long, how can you write a variable expression to represent the number of pages you will need to read each day?
- **Videos**
  - Khan Academy (khanacademy.org)
    - Variables, Expressions, & Equations
    - Writing Basic Expressions Word Problems
  - YouTube by larryschmidt
    - Writing an Equation to Represent a Real-World Problem—Variables on Both Sides
  - YouTube by Mr. Harrington's Math
    - Writing Expressions for Real-World Problems

No alternate standard for 6.EE.9

COURSE: Alternate Mathematics 6th Grade
DOMAIN: Geometry (G)
CLUSTER: Solve real-world and mathematical problems involving area, surface area, and volume

Standard	Performance Objectives
A.6.G.1 Solve real-world and mathematical problems about area using unit squares.	**A.6.G.1.1** Solve real-world and mathematical problems about area using unit squares.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.6.G.1.1 (A) Solve real-world and mathematical problems about area using unit squares.	**A.6.G.1.1** (B) Organize squares in the given area.	**A.6.G.1.1** (C) Indicate the inside of a space.

Real World Connections:

- Use unit squares to measure spaces.
- Use unit squares to measure drawings and objects .
- Increase spatial awareness.

Vocabulary

- Area
- Space
- Unit squares

Resources:

- **Websites, articles, and other collections**
  - EasyTeaching (easyteaching.net)
    - Area and Perimeter
  - Khan Academy (khanacademy.com)
    - Measuring Rectangles with Different Unit Squares
  - Math Worksheets 4 Kids (mathworksheets4kids.com)
    - Area of Shapes by Counting Unit Squares | Area Worksheets
  - WorksheetWorks.com (worksheetworks.com)
    - Counting Area
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - Area and Perimeter Games
  - Skills You Need (skillsyouneed.com)
    - Calculating Area
- **Activities**
  - Tape off a section of floor tiles and count to determine the area.
  - Use square cheese crackers (Starburst also work well) to act as tile squares and fill in spaces.
- **Videos**
  - Khan Academy (khanacademy.org)
    - Intro to Area and Unit Squares
  - LearnZillion (learnzillion.com)
    - Find the Area of a Square or Rectangle by Counting Unit Squares
  - YouTube by TenMarks Amazon

COURSE: Alternate Mathematics 6th Grade
DOMAIN: Geometry (G)
CLUSTER: Solve real-world and mathematical problems involving area, surface area, and volume

- Identifying Area of a Rectangle by Counting Unit Squares: 3.MD.5a

COURSE: Alternate Mathematics 6th Grade
DOMAIN: Geometry (G)
CLUSTER: Solve real-world and mathematical problems involving area, surface area, and volume

Standard	Performance Objectives
A.6.G.2 Solve real-world and mathematical problems about volume using unit cubes.	**A.6.G.2.1** Solve real-world and mathematical problems about volume using unit cubes.

I Can Statements

MOST COMPLEX ⟵ ⟶ LEAST COMPLEX

A.6.G.2.1 (A) Solve real-world and mathematical problems about volume using unit cubes.	**A.6.G.2.1** (B) Fill a container with unit cubes and count the unit cubes.	**A.6.G.2.1** (C) Identify the inside of a container for volume.

Real World Connections:

- Measure spaces.
- Count squares.
- Increase spatial understanding.

Vocabulary

- Container
- Space
- Volume

Resources:

- **Websites, articles, and other collections**
  - Math Worksheets 4 Kids (mathworksheets4kids.com)
    - Volume by Counting Cubes Worksheets
  - Math Worksheets Land (mathworksheetsland.com)
    - Measuring Volume with Unit Cubes—Step-by-Step Lesson
  - Common Core Sheets (commoncoresheets.com)
    - Finding Volume with Unit Cubes Worksheet
  - Education.minecraft.net
    - Volume World Lesson
    - Area and Volume Lessons
- **Activities**
  - Play Minecraft-based activities.
  - Find the volume of a rectangular prism in various cubic units by filling it with unit cubes and counting them or by counting the number of unit cubes in one layer and multiplying by the number of layers.
- **Videos**
  - SplashLearn (splashlearn.com)
    - Volume Using Unit Cubes—Grade 5 Math
  - Help Teaching—Sunstone Education (helpteaching.com)
    - Measuring Volume with Unit Cubes
  - YouTube by #kispride
    - Minecraft in Education: Finding Volume by Adding Layers (5th Grade Technology Integration)
  - YouTube by Math with Mr. J
    - Finding Volume with Unit Cubes | How to Find Volume

COURSE: Alternate Mathematics 6th Grade
DOMAIN: Geometry (G)
CLUSTER: Solve real-world and mathematical problems involving area, surface area, and volume

- Khan Academy (khanacademy.org)
  - Measuring Volume with Unit Cubes
- YouTube by Icon Math
  - Measuring Volume by Counting Unit Cubes

No alternate standard for 6.G.3 and 6.G.4

COURSE: Alternate Mathematics 6th Grade
DOMAIN: Statistics and Probability (SP)
CLUSTER: Develop understanding of statistical variability

Standard	Performance Objectives
A.6.SP.1-2 Display data on a graph or table that shows variability in the data.	**A.6.SP.1-2.1** Display data on a graph or table that shows variability of data.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.6.SP.1-2.1 (A) Display data on a graph or table that shows variability of data.	**A.6.SP.1-2.1** (B) Display one set of data on a graph or table.	**A.6.SP.1-2.1** (C) Sort information into two categories.

Real World Connections:

- Create a graph based on a classroom survey.
- Create a graph based on measurements.
- Create a graph to compare weather patterns.
- Create a graph representing student votes.

Vocabulary

- Bar graph
- Data
- Data point
- Data set
- Equal
- Graph
- Less
- Line plot
- More
- Picture graph
- Represent
- Survey
- Table
- Tally
- X-axis
- Y-axis

Resources:

- **Websites, articles, and other collections**
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Using and Handling Data
  - The Mathematics Shed (mathematicshed.com)
    - How to Teach Data Handling Across the Curriculum
  - Math Goodies (mathgoodies.com)
    - Bar Graphs
    - Line Graphs
  - Khan Academy (khanacademy.org)
    - Represent and Interpret Data
    - Data and Statistics
  - Education.com
    - Graphing and Data Activities for Kids
- **Activities**
  - Using concrete objects, ask students to sort data based on a single attribute (e.g., blocks vs. cars). Give students a model to organize the data into a picture or bar graph. Compare the data sets to identify more or less.
  - Use premade graphs and concrete objects as models to demonstrate how to organize information on a graph.

- Use manipulatives to display the frequency of a data set on a line.
- Help students collect data (e.g., favorite ice cream, amount of time spent watching television, etc.) and then have them select the correct graphical representation to display the data.
- Collect graphs from a variety of sources (e.g., internet, magazines, etc.) and have students sort them by type (e.g., bar graph, line plot, picture graph, etc.).

- **Videos**
  - YouTube by Angelyn Ong
    - Tables and Bar Graphs
  - YouTube by Mudskipper's Kids World
    - Bar Graphs | Kids Fun Math
  - BrainPOP Jr. (jr.brainpop.com)
    - Line Graphs
  - YouTube by Matilda Olowu
    - Graphs—BrainPOP
  - YouTube by Math Songs by NUMBEROCK
    - Bar Graphs and Picture Graphs Song | 2nd Grade-3rd Grade
  - YouTube by Icon Math
    - Creating Bar Graphs

No alternate standard for 6.SP.3 AND 6.SP.4

COURSE: Alternate Mathematics 6th Grade
DOMAIN: Statistics and Probability (SP)
CLUSTER: Summarize and describe distributions

Standard	Performance Objectives
A.6.SP.5 Using vocalization, sign language, augmentive communication, or assistive technology, summarize data distributions shown in graphs or tables.	**A.6.SP.5.1** Summarize data distributions shown in graphs or tables.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.6.SP.5.1 (A) Summarize data distributions shown in graphs or tables.	**A.6.SP.5.1** (B) Use a graph to determine which category has the most and which category has the least.	**A.6.SP.5.1** (C) Identify the data in a chart.

Real World Connections:

- Read graphs in newspapers, magazines, and textbooks.
- Interpret charts about weather.

Vocabulary

- Chart
- Compare
- Data
- Distribution
- Equal
- Graph
- Least
- Most
- Plot
- Represent
- Table
- Variable
- X-axis
- Y-axis

Resources:

- **Websites, articles, and other collections**
  - Khan Academy (khanacademy.org)
    - Unit: Represent and Interpret Data
    - Unit: Data and Statistics
  - The Mathematics Shed (mathematicshed.com)
    - How to Teach Data Handling Across the Curriculum
    - Data Shed Games and Worksheets
  - Math Goodies (mathgoodies.com)
    - Comparing Graphs
  - Easy Teaching (easyteaching.net)
    - Data Worksheets
  - Nussbaum Education Network, LLC (mrnussbaum.com)
    - Graphing
- **Activities**
  - Use an object representing the data set to identify which category has more or less on a bar graph, picture graph, or line plot.
  - Use varying levels of support (LOS) to help the student understand the context of the bar graph, picture graph, or line plot. (e.g., "What

does this graph show?" "What does this category represent?" "Which has more?" "Which has less?").
    - Select two categories for graph for comparison (e.g., students with pets vs. students without pets). Count or identify the total for the first category. Use a concrete object, such as blocks snapped together, to model the total. Repeat this for the second category. Identify which category has more and which category has less by aligning the connected blocks representing the total for each category side-by-side and end-to-end. Count the difference between the shorter blocks and the longer blocks to determine how many more or less one category has than the other.
    - Use manipulatives, such as concrete items and counters, along with premade graphs. Velcro numbers and pictures may help students create their own graphs.
- **Videos**
    - YouTube by Leydi Jimenez Martinez
        - Bar Graphs—BrainPOP Jr.
    - YouTube by Melissa Morey
        - Kindergarten Math: Using Data to Create a Graph
    - YouTube by Icon Math
        - Reading Data Bar Graphs
    - YouTube by Math & Learning Videos 4 Kids
        - Bar Graphs 3rd Grade—Solve Elementary Problems Math Video
    - YouTube by Science4Us
        - Learning About Line Graphs

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Ratios and Proportional Relationships (RP)
CLUSTER: Analyze proportional relationships and use them to solve real-world and mathematical problems

Standard	Performance Objectives
A.7.RP.1-3 Use a ratio to model or describe a relationship.	**A.7.RP.1-3.1** Use a ratio to model or describe a relationship.

I Can Statements

MOST COMPLEX ⟵ ⟶ LEAST COMPLEX

A.7.RP.1-3.1 (A) Use a ratio to model or describe a relationship.	**A.7.RP.1-3.1** (B) Demonstrate a simple ratio relationship (i.e., The ratio of wings to beaks in the birdhouse in the zoo was 2 to 1.).	**A.7.RP.1-3.1** (C) Match pictures to corresponding simple ratios.

Real World Connections:

- Use appropriate quantities when cooking (e.g., two teaspoons of sugar to one cup of flour).
- Compare unit rates while shopping.
- Determine the amount of paint needed to paint something.
- Make a model to scale.

Vocabulary

- Compare
- Model
- Part
- Part-to-part
- Part-to-whole
- Ratio
- Whole

Resources:

- **Websites, articles, and other collections**
  - Teaching Channel (learn.teachingchannel.com)
    - Introduction to Ratios and Proportional Relationships
  - Khan Academy (khanacademy.org)
    - Unit: Ratios, Rates, & Percentages
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Ratios
  - Math Games (mathgames.com)
    - Ratios
- **Activities**
  - Use manipulatives to act out problems (i.e., There are 15 cookies and three children. How many cookies are there for each child?)
  - Give students a ratio with two different types of counters or manipulatives for each ratio unit (e.g., 2:6 would be represented with two coins and six bear counters). Then have students create the same ratio with two different types of counters (e.g., two token chips and six cubes). Provide students with response options or AAC device with options programmed.
  - For students approaching least complexity, rather than using numbers to represent simple ratios, have students indicate proportional relations by stating same or not the same.
  - Use high-interest items that demonstrate a constant ratio, such as a favorite car (four wheels to one car) or a favorite pet (two wheels to one head, four legs to one body, one tail to one body)
  - Consider a tangible token economy system which follows a ratio (e.g., For every three tokens, Mike earns five minutes of time listening to his music.).

- Provide a ratio and ask the students to use unit blocks to show the ratio (i.e., the ratio of girls to boys in our class is 3:2. Use the unit blocks to show the ratio of girls to boys.).

- **Videos**
  - YouTube by WCLN
    - WCLN—Introduction to Ratios
  - YouTube by Marlon Nino-espino
    - BrainPOP—Ratios
  - YouTube by Eric Buffington
    - Ratios (Simplifying Math)

COURSE: Alternate Mathematics 7th Grade
DOMAIN: The Number System (NS)
CLUSTER: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Standard	Performance Objectives
A.7.NS.1 Add fractions with like denominators (e.g., halves, thirds, fourths, tenths) with sums less than or equal to one.	**A.7.NS.1.1** Add fractions with like denominators (halves, thirds, fourths, and tenths) so the solution is less than or equal to one.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.NS.1.1 (A) Add fractions with like denominators (halves, thirds, fourths, and tenths) so the solution is less than or equal to one.	**A.7.NS.1.1** (B) Identify fractions with like denominators.	**A.7.NS.1.1** (C) Identify the numerator and the denominator of a fraction.

Real World Connections:

- Measure ingredients for preparing recipes.
- Add measurements when building an item.
- Tell time.

Vocabulary

- Add
- Equal
- Fraction
- Like/common denominator
- Numerator
- Whole

Resources:

- **Websites, articles, and other collections**
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Fractions
  - Toy Theater | Educational Games for Kids (toytheater.com)
    - Fraction Strips
  - The Math Learning Center (mathlearningcenter.org)
    - Fractions for iPad, Web, and Chrome
  - Larson Mathematical Practices (mathematicalpractices.com)
    - Printable Manipulatives
  - Khan Academy (khanacademy.org)
    - Add Fractions with Common Denominators
  - MathTeacherCoach.com (mathteachercoach.com)
    - Adding and Subtracting Fractions in the Real World
- **Activities**
  - Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation.
  - Use fractions involving motivating objects (e.g., pizza, coloring markers in a box, pieces of a building blocks set, etc.).
  - Use manipulatives (e.g., Cuisenaire Rods, fraction bars, fraction circles, color tiles, geoboards, building blocks, etc.).
  - Incorporate technology, including computer representations, videos, animations, and talking calculators.
  - Use a token economy system that embeds fractions (e.g., "You earned 1/4 of a pizza. You have 3/4 left to eat and then you get computer

time.").
    - Use real-world items with fractions (e.g., measuring cups, measuring spoons, rulers, measuring tape, etc.).
    - Use fraction manipulatives (each piece may be labeled with the corresponding unit fraction) to model each fraction and join them to find the sum (e.g., 1/4+2/4=3/4).
- **Videos**
    - TeacherTube by Salem Media Group, Inc. (teachertube.com)
        - Add and Subtract Fractions with Like Denominators (same size pieces) Day 31
        - Adding Fractions With the Same Denominator
    - YouTube by Math-N-Roll
        - Add and Subtract Fractions With Like Denominators. Word Problems. Grade 4
    - YouTube by Smile and Learn
        - Learn How to Add Fractions—Same Denominator—Math for Kids
    - YouTube by Alex Lochoff
        - Adding Fractions (Same Denominator)

COURSE: Alternate Mathematics 7th Grade
DOMAIN: The Number System (NS)
CLUSTER: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Standard	Performance Objectives
A.7.NS.2.a Solve multiplication problems with products to 100.	**A.7.NS.2.a.1** Using calculators, solve multiplication problems with products to 100.

I Can Statements

MOST COMPLEX ⟵ ⟶ LEAST COMPLEX

A.7.NS.2.a.1 (A) Using calculators, solve multiplication problems with products to 100.	**A.7.NS.2.a.1** (B) Solve multiplication problems with products to 60.	**A.7.NS.2.a.1** (C) Solve multiplication problems with products to 20.

Real World Connections:

- Determine pay based on hourly wages.
- Convert measurements in recipes.
- Determine how much to tip at a restaurant.
- Shop for sale items.
- Plan a trip (e.g., hotel cost per day).

Vocabulary

- Array
- Calculator
- Factor
- Multiplication
- Multiply
- Product
- Solve
- Times

Resources:

- **Websites, articles, and other collections**
  - Houghton Mifflin Harcourt The Learning Company (hmhco.com)
    - Teaching Multiplication with Arrays in Math
  - Luminous Learning (luminouslearning.com)
    - How to Teach Multiplication Facts: Proven Strategies in Special Education
    - Number and Operations Photos
  - We Are Teachers (weareteachers.com)
    - 35 Fun, Hands-On Ways to Teach Multiplication
  - GregTangMath.com
    - KaKooma Game
  - Math Playground LLC (mathplayground.com)
    - Penguin Jump Multiplication
  - BrainPOP Jr. (jr.brainpop.com)
    - Multiplying by 0 or 1
- **Activities**
  - Use base-10 blocks to perform repeated addition.
  - Use objects or manipulatives to create arrays (e.g., egg carton, muffin tray, paint tray, building blocks, candy bar, etc.).
  - Ask students to write or select the equation that represents a given model.
  - Use a task analysis to teach students how to use calculators and multiplication tables.
  - Use talking calculators, interactive whiteboards, calculators on tablets, calculators on smart phones, etc.

- **Videos**
  - We Are Teachers (weareteachers.com)
    - Make a Dice Calculator
    - Our Favorite Multiplication and Division Videos on YouTube
  - Khan Academy (Khanacademy.org)
    - Basic Multiplication
  - YouTube by JoAnn's School
    - Grade 3 Math 3.5, Model Multiplication with Arrays

COURSE: Alternate Mathematics 7th Grade
DOMAIN: The Number System (NS)
CLUSTER: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Standard	Performance Objectives
A.7.NS.2.b Solve division problems with divisors up to five and also with a divisor of 10 without remainders.	**A.7.NS.2.b.1** Solve division problems with divisors up to five and also with a divisor of 10 without remainders (e.g., using calculators or concrete objects).

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.NS.2.b.1 (A) Solve division problems with divisors up to five and also with a divisor of 10 without remainders (e.g., using calculators or concrete objects).	**A.7.NS.2.b.1** (B) Demonstrate that in division, the larger number is divided by the smaller number.	**A.7.NS.2.b.1** (C) Divide manipulatives into equal groups.

Real World Connections:

- Determine equal shares.
- Prepare recipes.
- Divide work tasks equally between class members.
- Create a budget.
- Divide money (e.g., How many video games can you buy with $50?).

Vocabulary

- Divide
- Dividend
- Division
- Divisor
- Equal
- Fair shares
- Partitive division
- Quotient
- Separate
- Sets
- Subsets
- Subtract

Resources:

- **Websites, articles, and other collections**
  - Houghton Mifflin Harcourt The Learning Company (hmhco.com)
    - Teaching Multiplication and Division Relationship Using Arrays
  - Didax, Inc. (didax.com)
    - Virtual Manipulatives for Math
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - Division Facts
  - Math Tech Connections Inc. (mathtechconnections.com)
    - Division Strategies: Introducing Division to Third Graders
  - Math Worksheets Center (mathworksheetscenter.com)
    - Division Worksheets
  - Education.com (education.com)
    - Division Online Games
    - Division Worksheets
  - We Are Teachers (weareteachers.com)
    - 30 Creative Ways to Make Teaching Division Easier

- **Activities**
  - Starting with a big group of cubes, pull equal cubes into each group, etc. to demonstrate equal fair shares.
  - Decompose numbers with concrete objects to demonstrate division. Use counting to get the answers. Match the action of decomposing with vocabulary (e.g., divide or separate into equal groups).
  - Use partitive division or fair sharing (i.e., division problems where the divisor indicates the number of groups the dividend is to be divided into) to demonstrate dividing the dividend into the number of equal groups indicated by the divisor (e.g., Twelve divided by three would involve placing 12 objects into three equal groups.).
- **Videos**
  - Khan Academy (khanacademy.org)
    - Division Intro
  - YouTube by MATH-N-ROLL
    - What is Division? Grade 3
  - YouTube by Homeschool Pop
    - Division for Kids | Basic Math Learning Video
  - YouTube by hand2mind
    - Grade 4 W1D5—Divide With a 1-Digit Divisor
    - Grade 4 W2D1—Divide by Multiples of 10

COURSE: Alternate Mathematics 7th Grade
DOMAIN: The Number System (NS)
CLUSTER: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Standard	Performance Objectives
A.7.NS.2.c-d Express a fraction with a denominator of 10 as a decimal.	**A.7.NS.2.c-d.1** Express a fraction with a denominator of 10 as a decimal (using a calculator or manipulatives).

I Can Statements

MOST COMPLEX ⟵ ⟶ LEAST COMPLEX

A.7.NS.2.c-d.1 (A) Express a fraction with a denominator of 10 as a decimal (using a calculator or manipulatives).	**A.7.NS.2.c-d.1** (B) Match a fraction with a denominator of 10 to the corresponding decimal.	**A.7.NS.2.c-d.1** (C) Identify a fraction and a decimal.

Real World Connections:

- Count money.
- Spend money.
- Measure weight.
- Take your temperature.
- Measure with a ruler or yardstick.

Vocabulary

- Decimal
- Decimal point
- Denominator
- Fraction
- Numerator
- Place value
- Tenths

Resources:

- **Websites, articles, and other collections**
  - Khan Academy (khanacademy.org)
    - Unit: Decimals
  - Iknowit (Iknowit.com)
    - Decimals: Tenths
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Decimals
  - Didax, Inc. (didax.com)
    - Virtual Manipulatives for Math
  - Toy Theater | Educational Games for Kids (toytheater.com
    - Virtual Manipulatives
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - Decimal Games
- **Activities**
  - Teach explicitly how the position of a digit after the decimal point relates to its value (e.g., A digit one place to the right of the decimal point represents 1/10, so whatever digit is in that place value position is worth that number of tenths—a three in the tenths place has a

value of three tenths.).
- Teach explicitly how to read decimals to the tenths (e.g., 0.1) by using a place value chart (e.g., When digit cards are used to build a decimal number on a place value chart, if there is only a four in the tenths column, then the number is four tenths or 0.4.).
- Use a 1×10 grid and shade a tenth to demonstrate 1/10. Ask students to write or select a written form for the decimal that represents 1/10. Repeat with multiple decimals (0.1-0.9).
- Teach students to use a calculator to convert a fraction to a decimal.

- **Videos**
  - Khan Academy (khanacademy.org)
    - Writing a Number as a Fraction and Decimal
  - YouTube by Mary Anne Fowler
    - Decimals Intro—BrainPOP
  - YouTube by True Curriculum
    - What is a Decimal?
  - YouTube by Math with Mr. J
    - Decimal Models: Tenths

COURSE: Alternate Mathematics 7th Grade
DOMAIN: The Number System (NS)
CLUSTER: Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

Standard	Performance Objectives
A.7.NS.3 Compare quantities represented as decimals in real-world examples to tenths.	**A.7.NS.3.1** Compare quantities represented as decimals in real-world examples to tenths.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.NS.3.1 (A) Compare quantities represented as decimals in real-world examples to tenths.	**A.7.NS.3.1** (B) Given a picture of two quantities representing decimals to tenths, select the corresponding decimals.	**A.7.NS.3.1** (C) Match a decimal to tenths to a corresponding picture.

Real World Connections:

- Count money.
- Spend money.
- Measure weight.
- Take your temperature.
- Measure with a ruler or yardstick.

Vocabulary

- Compare
- Decimal
- Decimal point
- Equal
- Greater than
- Less than
- Place value
- Tenths

Resources:

- **Websites, articles, and other collections**
  - Khan Academy (khanacademy.org)
    - Comparing Decimals Visually
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - Decimal Games
  - Math is Fun by Rod Pierce(Mathsisfun.com)
    - Ordering Decimals
- **Activities**
  - Use base-10 blocks to build a concrete representation of two decimals to the tenths place, whose values are less than one (e.g., .2, .3, .4, etc.).
  - Compare two decimals to the tenths place arranged in a place value chart to determine if a number is greater than, less than, or equal to another number. Use symbols of <, >, and =.
- **Videos**
  - YouTube by Adrian Smallwood
    - Comparing Decimals
  - YouTube by Education Galaxy
    - 4th Grade—Math—Compare and Order Decimals—Topic Overview Part 1 of 2

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Expressions and Equations (EE)
CLUSTER: Use properties of operations to generate equivalent expressions.

Standard	Performance Objectives
A.7.EE.1 Use the properties of operations as strategies to demonstrate that expressions are equivalent.	**A.7.EE.1.1** Use the properties of operations as strategies to demonstrate that expressions are equivalent (associative and commutative properties).

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.EE.1.1 (A) Use the properties of operations as strategies to demonstrate that expressions are equivalent (associative and commutative properties).	**A.7.EE.1.1** (B) Using associative and commutative properties, match pictures to show expressions that are equivalent (e.g., 2+3=3+2, 4×2 =2×4, etc.)	**A.7.EE.1.1** (C) Match pictures that show equal quantities.

Real World Connections:

- Represent that everyone has the same amount of candy in numerous ways.
- Determine if sharing is equivalent.
- Recognize that three discs and three squares are the same quantity.
- Recognize that different arrangements of the same amount are equal (e.g., different arrangements of four dots—connection to subitizing).

Vocabulary

- Associative property
- Commutative property
- Equivalent
- Operations
- Strategies

- **Websites, articles, and other collections**
  - Lumen Learning (courses.lumenlearning.com)
    - Rewriting Expressions Using the Commutative and Associative Properties
  - Monterey Institute for Technology and Education, the NROC Project (montereyinstitute.org)
    - Associative, Commutative, and Distributive Properties
  - Better Lesson (betterlesson.com)
    - Working with the Properties!
    - Equivalent Numerical Expressions, Day 2 of 2
  - Math Geek Mama (mathgeekmama.com)
    - Free Equivalent Expressions Activity
- **Activities**
  - Solve equivalent expressions to illustrate that they are equivalent (e.g., Fill in the blank to make a true statement: 2+6=6+___. Fill in the blank to make a true statement: 3+5=___+3. Fill in the blank to make a true statement: 4+___=3+4.).
  - Given a model, create an expression using manipulatives (e.g., Three blocks plus two blocks equals five blocks.).
  - Match pictures of quantities of objects to their numerical equivalent (e.g., Four balls matches to the number four.).
  - Given a group of three objects, a group of four objects, and a group of seven objects, match to 3+4=7.
  - Indicate that 2+3 is the same as 3+2.

- Answer yes or no when asked, "Is 2+3 equal to 3+2?".
- Answer yes or no when asked, "Is 2+3 equal to 4+2?".

- **Videos**
  - YouTube by Mathispower4u
    - Use the Commutative and Associate Properties of Real Numbers
  - Online Math Learning Resources (OnlineMathLearning.com)
    - Commutative, Associative, Distributive Properties (Grade 3)
  - Mississippi Public Broadcasting Learning Media (mpb.pbslearningmedia.org)
    - Equivalent Expressions with the Distributive Property
    - Commutative and Associative Properties of Addition
  - YouTube by Planet Nutshell
    - Math Shorts Episode 6—Equivalent Expressions with the Distributive Property
  - Khan Academy (khanacademy.org)
    - Equivalent Expressions

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Expressions and Equations (EE)
CLUSTER: Use properties of operations to generate equivalent expressions.

Standard	Performance Objectives
A.7.EE.2 Identify an arithmetic sequence of whole numbers with a whole number common difference.	**A.7.EE.2.1** Identify an arithmetic sequence (pattern) of whole numbers with a whole number common difference.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.EE.2.1 (A) Identify an arithmetic sequence (pattern) of whole numbers with a whole number common difference.	**A.7.EE.2.1** (B) Given a number sequence and the rule, find the missing numbers.	**A.7.EE.2.1** (C) Create a sequence (pattern) using a common whole number.

Real World Connections:

- Each person brings 2 candy bars to the class party. Find how many candy bars in all. What is the rule?
- Solve two-step addition and subtraction equations.
- Understand the concept of equality. Using models, solve one-step addition and subtraction equations.
- Recognize equal amounts on both sides of an equation.

Vocabulary

- Arithmetic sequences
- Common difference
- Patterns
- Whole numbers

Resources:

- **Websites, articles, and other collections**
  - Study.com (study.com)
    - Arithmetic Sequences: Definition & Finding the Common Difference
    - Equivalent Number Sentences Activities
  - Colorado Department of Education (cde.state.co.us)
    - Word Problems—Research and Practice Guide
- **Activities**
  - Use in and out boxes to find the rule.
  - After determining that 5+5=10, decompose 10 into three + seven.
  - After determining that 9-6=3, determine that three is composed of 3+1.
  - If there is a quantity of five on one side of the equation and a quantity of two on the other side, what quantity is added to make it equal?
  - If you have three balls and you get some more balls, how many did you get if you now have eight balls?
  - Identify the amount needed to equal the value on the given side of an equation. Three objects + two objects will equal five objects. Given a number from two to 10, decompose the number to create a balanced equation (connection to decomposition of numbers).
  - Match equal quantities (e.g., Three triangles is the same quantity as three circles.).
- **Videos**
  - YouTube by Susan Burke
    - Equivalent Number Sentences

- YouTube by MatholiaChannel
  - Number Sentences
- Khan Academy (khanacademy.org)
  - Intro to Arithmetic Sequences
- YouTube by Lucas R
  - Learn how to find the common difference between an arithmetic sequence.
- YouTube by Pine View Middle School math
  - ALEKS: Identifying arithmetic sequences and finding the common difference (KC)

No alternate standard for 7.EE.3

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Expressions and Equations (EE)
CLUSTER: Solve real-life and mathematical problems using numerical and algebraic expressions and equations

Standard	Performance Objectives
A.7.EE.4 Use the concept of equality with models to solve one-step addition and subtraction equations.	**A.7.EE.4.1** Solve one-step addition and subtraction equations.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.EE.4.1 (A) Solve one-step addition and subtraction equations.	**A.7.EE.4.1** (B) Identify the inverse/opposite operation in an equation.	**A.7.EE.4.1** (C) Identify the operation in an equation.

Real World Connections:

- Use an equation to determine the amount of money saved by purchasing a pair of shoes on sale.
- Write and solve equations to determine the lengths of the sides of a triangle.
- Write and solve equations to determine the perimeter of the triangle.

Vocabulary

- Addition
- Equality
- Equation
- One-step addition
- One-step subtraction
- Subtraction

Resources:

- **Websites, articles, and other collections**
  - The NROC Project (nroc.org)
    - Solving One-Step Equations Using Properties of Equality
  - Math Worksheets 4 Kids (mathworksheets4kids.com)
    - One-Step Equation: Addition and Subtraction Worksheets
  - Math Planet (mathplanet.com)
    - Properties of Equalities
  - IXL Learning (IXL.com)
    - Z.7 Solve one-step addition and subtraction equations with whole numbers.
- **Activities**
  - If there is a quantity of five on one side of the equation and a quantity of two on the other side, what quantity is added to make it equal?
  - If I have three balls and I get some more balls, how many did I get if I now have seven?
  - Given 4+___=12, identify the missing amount using models.
  - Given 12 -___=5, identify the missing amount using models.
  - Given 10=2+____, identify the missing amount using models.
  - Given a number from two to 10, decompose the number to create a balanced equation (connection to decomposition of numbers).
- **Videos**
  - YouTube by Brian McLogan
    - How to solve an equation using the addition property of equality

- Khan Academy (khanacademy.org)
  - One-Step Addition & Subtraction Equations

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Geometry (G)
CLUSTER: Draw, construct, and describe geometrical figures and describe the relationships between them

Standard	Performance Objectives
A.7.G.1 Match two similar geometric shapes that are proportional in size and in the same orientation.	**A.7.G.1.1** Match two similar geometric shapes that are proportional in size and in the same orientation.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.G.1.1 (A) Match two similar geometric shapes that are proportional in size and in the same orientation.	**A.7.G.1.1** (B) Match two-dimensional shapes of the same orientation (e.g., two triangles or two rectangles).	**A.7.G.1.1** (C) Match two-dimensional shapes (e.g., circle, triangle, rectangle, square).

Real World Connections:

- Draw proportional geometric shapes.
- Find proportional geometric shapes in architecture and drafting.
- Locate geometric shapes in construction that are proportional in size.
- Compare geometric shapes found in street signs.

Vocabulary

- Circle
- Geometric shapes
- Orientation
- Proportional
- Rectangle
- Similar
- Square
- Triangle

Resources:

- **Websites, articles, and other collections**
  - Teachnology, Inc.(Teach-nology.com)
    - Shape Lesson Plans
  - Education.com (education.com)
    - Worksheet—Shape Coloring
  - Pre-K Pages by Vanessa Levin (Pre-kpages.com)
    - Shapes Activities for Preschoolers
  - Pocket of Preschool (pocketofpreschool.com)
    - 2D Shape Activities for Preschool, Pre-K, and Kindergarten
  - Kindergarten Works (kindergartenworks.com)
    - 21 Creative Ways to Teach 2D Shapes in Kindergarten
  - Flashcards for Kindergarten (flashcardsforkindergarten.com)
    - Shape Flashcards
  - SparkleBox (sparklebox.co.uk)
    - 2D Shape Attributes Chart Worksheets
  - Superstar Worksheets (superstarworksheets.com)
    - Shape Attributes Worksheets
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - Attribute—Definition with Examples

- National Council of Teachers in Mathematics (nctm.org)
  - Illuminations Shape Tool
- **Activities**
  - Have students work together using a rope to create 3D shapes. The teacher plays the role of the skeptic and asks students to justify how they know their shape satisfies its defined characteristics. Students will need everyone in their group to successfully build these complex shapes and provide a convincing argument.
  - Play shape scavenger hunt.
  - Use straws and pipe cleaners or straws and twist ties to create shapes.
  - Use twist ties or pipe cleaners to allow students to make the shapes that are described by the teacher.
  - Create shape robots (e.g., square body, circle head, triangle eyes and nose, etc.). Allow students to create the shapes as described by the teacher.
- **Videos**
  - Khan Academy (khanacademy.org)
    - Recognizing Shapes
    - Intro to Triangle Similarity
  - YouTube by Kelly Bow
    - Similar Shapes—Find a Missing Side Using Proportions

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Geometry (G)
CLUSTER: Draw, construct, and describe geometrical figures and describe the relationships between them

Standard	Performance Objectives
A.7.G.2 Recognize geometric shapes with given conditions.	**A.7.G.2.1** Recognize basic two-dimensional geometric shapes with given conditions (e.g., triangle, rectangle, square).

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.G.2.1 (A) Recognize basic two-dimensional geometric shapes with given conditions (e.g., triangle, rectangle, square).	**A.7.G.2.1** (B) Identify the possible two-dimensional shape given one condition (e.g., sides, angles).	**A.7.G.2.1** (B) Identify the side and angle of a two-dimensional shape.

Real World Connections:

- Recognize street signs based upon their geometric shape.
- Find geometric shapes in architecture and drafting.
- Locate geometric shapes in construction that have certain conditions.
- Compare geometric shapes found in the design of buildings.

Vocabulary

- Attribute
- Conditions
- Geometric shapes
- Rectangle
- Square
- Triangle
- Two-dimensional

Resources:

- **Websites, articles, and other collections**
  - Math Worksheets Land (mathworksheetsland.com)
    - Making Two-Dimensional Shapes—Guided Lesson
    - Making Two-Dimensional Shapes—Guided Lesson Explanation
    - Making Two-Dimensional Shapes—Independent Practice
    - Making Two-Dimensional Shapes—Step-by-Step Lesson
  - Math 4 Texas Education Service Center Region 11 (Math4texas.org)
    - Two-Dimensional Shapes
  - EasyTeaching (easyteaching.net)
    - 2D Shape Worksheets
- **Activities**
  - Play with flashcards showing the different two-dimensional shapes.
  - Play "Guess who?" using shapes.
  - Find shapes in real-world areas.
- **Videos**
  - Khan Academy (khanacademy.org)
    - Recognizing Shapes
  - YouTube by eHowEducation
    - Geometry: How to Identify Shapes: Math Concepts

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Geometry (G)
CLUSTER: Draw, construct, and describe geometrical figures and describe the relationships between them

Standard	Performance Objectives
A.7.G.3 Match a two-dimensional shape with a three-dimensional shape that shares an attribute.	**A.7.G.3.1** Match the face of a three-dimensional object with a two-dimensional shape (e.g., sides, corners vertices, faces).

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.G.3.1 (A) Match the face of a three-dimensional object with a two-dimensional shape (e.g., sides, corners vertices, faces).	**A.7.G.3.1** (B) Identify the attributes of a three-dimensional object (e.g., sides, corners vertices, faces etc.).	**A.7.G.3.1** (B) Sort shapes into three-dimensional shapes and two-dimensional shapes.

Real World Connections:

- Find geometric shapes in architecture and drafting.
- Locate geometric shapes in construction that have certain conditions.
- Compare geometric shapes found in the design of buildings.
- Take pictures of three-dimensional shapes to illustrate their two-dimensional attributes.
- Observe and spot three-dimensional shapes around you.
- Locate three-dimensional shapes in nature.

Vocabulary

- Color
- Faces
- Sides
- Size
- Three-dimensional shape
- Two-dimensional shape
- Texture
- Vertices

Resources:

- **Websites, articles, and other collections**
  - Westerly Public Schools (westerly.k12.ri.us)
    - Identify, Describe, Analyze, Create, and Compare 2D and 3D Shapes
  - Math Worksheets 4 Kids (mathworksheets4kids.com)
    - Comparing 2D and 3D Shapes Worksheets
  - Birch Grove Primary School (bgps.sharpschool.net)
    - First Grade Math | Shapes
  - SplashLearn (splashlearn.com)
    - Three-Dimensional Shapes
    - Geometry Games for Kindergarteners
  - BYJU's (byjus.com)
    - Three-Dimensional Shapes
  - Skills You Need (skillsyouneed.com)
    - Three-Dimensional Shapes: Polyhedrons, Curved Solids and Surface Area
- **Activities**
  - Have students observe and spot things around them that contain three-dimensional shapes.

- Make a picture graph that shows the various 3D shapes and allow students to list each shape's major characteristics.

- **Videos**
  - YouTube by Hollie Anne
    - Describe and Compare 2D and 3D Shapes
  - YouTube by DSD Advantage Math
    - 10.07—Comparing Two-Dimensional Shapes
  - Khan Academy (khanacademy.org)
    - Recognizing Shapes
  - YouTube by Learning Time Fun
    - 3D Shapes for Kids | 3D Shapes Names | Geometric Shapes | Math for Kids | 3D Shapes
  - YouTube by Jack Hartmann Kids Music Channel
    - 3D Shapes Song for Kids | Learn About 3D Shapes

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Geometry (G)
CLUSTER: Solve real-life and mathematical problems involving angle measure, area, surface area, and volume

Standard	Performance Objectives
A.7.G.4 Determine the perimeter of a rectangle by adding the measures of the sides.	**A.7.G.4.1** Determine the perimeter of a rectangle by adding the measures of the sides.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.G.4.1 (A) Determine the perimeter of a rectangle by adding the measures of the sides.	**A.7.G.4.1** (B) Measure the sides of a rectangle.	**A.7.G.4.1** (B) Outline the perimeter of an object.

Real World Connections:

- Observe and become spatially aware.
- Recognize rectangular objects.
- Measure the outside of shipping boxes to determine postage.
- Measure perimeter of a garden.
- Determine the space needed to construct a building.
- Measure to figure out whether a piece of carpet will fit in your bedroom.

Vocabulary

- Measure
- Rectangle
- Perimeter
- Sides

- **Websites, articles, and other collections**
  - Common Sense Education (commonsense.org)
    - Perimeter and Area Real-World Practice
  - Class Ace (Classace.io)
    - Learn About Perimeter
    - How to Find the Missing Side When You Know the Perimeter
    - How to Solve Perimeter Word Problems
  - Education.com (education.com)
    - Online Game: Alfalfa's Out of the Box: Perimeter, Area, and Addition
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - Perimeter of a Rectangle—Definition with Examples
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Perimeter
  - Maths with Mum (mathswithmum.com)
    - How to Find the Perimeter of Rectangles and Squares
  - Flexbooks Platform—CK-12 Foundation (flexbooks.ck12.org)
    - 9.2 Area and Perimeter of Rectangles
  - Math-Only-Math.com (math-only-math.com)
    - Perimeter of a Rectangle

- Ducksters (ducksters.com)
  - Kids Math Finding the Perimeter
- **Activities**
  - Find the perimeter of a square or rectangle by adding side lengths.
  - Use square grid paper to create a perimeter person.
- **Videos**
  - Khan Academy (khanacademy.org)
    - Perimeter: Introduction
    - Perimeter of a Shape
    - Perimeter & Area
    - Find Perimeter When Given Side Lengths
  - YouTube by mathantics
    - Math Antics—Perimeter
  - YouTube by Homeschool Pop
    - Perimeter for Kids | Math Lesson Video

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Geometry (G)
CLUSTER: Solve real-life and mathematical problems involving angle measure, area, surface area, and volume

Standard	Performance Objectives
A.7.G.5 Recognize angles that are acute, obtuse, and right.	**A.7.G.5.1** Recognize angles that are acute, obtuse, and right.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.G.5.1 (A) Recognize angles that are acute, obtuse, and right.	**A.7.G.5.1** (B) Recognize right angles.	**A.7.G.5.1** (C) Identify angles on a shape.

Real World Connections:

- Notice angles such as in spider webs, the letters in your name, and building/architecture/construction.
- Cut a pizza into slices and notice the angles.
- Recognize angles used in drawing.
- Notice angles found in construction or architecture.

Vocabulary

- Acute
- Angle
- Figure
- Obtuse
- Right

Resources:

- **Websites, articles, and other collections**
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - Angle—Definition with Examples
    - Acute Triangle—Definition with Examples
    - Obtuse Triangle—Definition with Examples
    - Right Triangle—Definition with Examples
  - Dorling Kindersley Limited (dkfindout.com)
    - Angles
  - Teacher's Pet (tpet.co.uk)
    - Angles
  - Math Worksheets 4 Kids (mathworksheets4kids.com)
    - Identifying Acute, Right, and Obtuse Angles Worksheets
  - Jumpstart Games, Inc.—Math Blaster (mathblaster.com)
    - Angles
  - Education.com (education.com)
    - Worksheet—Shapes with Right Angles
- **Activities**
  - Draw an angular picture of a dog or cat and have students identify each of the angles.
  - Draw pictures of stick people and have students find the angles.
  - Discuss the angles in a pizza cut into slices.
- **Videos**

- YouTube by Free School
  - Intro to Angles for Kids: Understanding Angles for Children
- YouTube by Clarendon Learning
  - Angles for Kids—An Intro into the World of Angles
- YouTube by Smile and Learn English
  - Angles—Types and Definition
- YouTube by NUMBEROCK
  - Angles Song | Acute, Obtuse, & Right Angles | 3rd & 4th Grade
- EG Videos (egvideos.com)
  - New York—Grade 4—Math—Measurement and Data—Angles—4.MD.5
- YouTube by Khan Academy
  - Recognizing Angles | Geometry | 4th Grade
  - Shapes and Angles

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Geometry (G)
CLUSTER: Solve real-life and mathematical problems involving angle measure, area, surface area, and volume

Standard	Performance Objectives
A.7.G.6 Determine the area of a rectangle using the formula for length × width, and confirm the result using tiling or partitioning into unit squares.	**A.7.G.6.1** Solve simple area problems with rectangles.

I Can Statements

MOST COMPLEX ⟵ ⟶ LEAST COMPLEX

A.7.G.6.1 (A) Solve simple area problems with rectangles.	**A.7.G.6.1** (B) Find the numbers representing length and width of a rectangle and insert the numbers into an equation (A=L×W).	**A.7.G.6.1** (C) Identify the sides of a rectangle as length and width.

Real World Connections:

- Measure lengths and spaces.
- Notice the size of an object—based upon its area—when drawing.
- Determine if there is enough space in the toy box to put all your toys.

Vocabulary

- Area
- Formula
- Length
- Partitioning
- Rectangle
- Side
- Unit square
- Width

Resources:

- **Websites, articles, and other collections**
  - Robert Kaplinshy Glenrock Consulting, LLC. (robertkaplinsky.com)
    - Robert Kaplinsky—Paint a Handball Wall
  - LearnZillion (learnzillion.com)
    - Use area models to find the area of rectangles.
  - IXL Learning (IXL.com)
    - Perimeter
  - EasyTeaching (easyteaching.net)
    - Area and Perimeter
  - Khan Academy (khanacademy.com)
    - Measuring Rectangles with Different Unit Squares
  - Math Worksheets 4 Kids (mathworksheets4kids.com)
    - Area of Shapes by Counting Unit Squares | Area Worksheets
  - WorksheetWorks.com (worksheetworks.com)
    - Counting Area
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - What is Rectangle?
    - Area of a Rectangle—Definition with Examples
    - What is Unit Cube?
  - Ducksters (ducksters.com)

- Kids Math: Finding Surface Area
- Area and Perimeter Games

- Education.com (education.com)
  - Area of a Rectangle Resources
- Skills You Need (skillsyouneed.com)
  - Calculating Area

- **Activities**
  - Use blue painter's tape to make shapes on the square tile floor and have students calculate the areas.
  - Tape off a section of floor tiles and count to determine area.
  - Use square cheese crackers (Starburst also work well) to act as tile squares and fill in spaces.
- **Videos**
  - Khan Academy (khanacademy.org)
    - Intro to Area and Unit Squares
  - LearnZillion (learnzillion.com)
    - Find the Area of a Square or Rectangle by Counting Unit Squares
  - YouTube by TenMarks Amazon
    - Identifying Area of a Rectangle by Counting Unit Squares: 3.MD.5a
  - YouTube by Homeschool Pop
    - Area for Kids
  - YouTube by Kids Academy
    - Area of Square and Rectangle | Geometry for Kids
  - YouTube by Periwinkle
    - Area of Square and Rectangle | Maths for Kids | Grade 5

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Statistics and Probability (SP)
CLUSTER: Use random sampling to draw inferences about a population

Standard	Performance Objectives
A.7.SP.1-2 Using vocalization, sign language, augmentive communication, or assistive technology, answer a question related to the collected data from an experiment, given a model of data, or from data collected by the student.	**A.7.SP.1-2.1** Answer a question related to collected data.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.SP.1-2.1 (A) Answer a question related to collected data.	**A.7.SP.1-2.1** (B) Answer a question for data collection.	**A.7.SP.1-2.1** (C) Identify data in a given model.

Real World Connections:

- Answer questions from a science experiment.
- Ask and answer questions about classmates.
- Create a T-Chart to make a decision about the class (e.g., where to go for a class field trip).

Vocabulary

- Collect
- Data
- Experiment
- Statistical question
- Survey
- Tally marks
- T-Chart
- Variability

Resources:

- **Websites, articles, and other collections**
  - Khan Academy (khanacademy.org)
    - Unit: Data and Statistics
    - Statistical Questions
  - Online Math Learning Resources (OnlineMathLearning.com)
    - Statistical Questions (Grade 6)s
  - Engage NY, New York State Education Department (engageny.org)
    - Grade 6 Mathematics Module 6, Topic A, Lesson 1 Understanding Distributions
- **Activities**
  - Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.
  - Give students a list of questions and guide them to determine which questions could have a range of answers (e.g., "Did you watch TV last night?" is not statistical, but "How many hours of TV per week do classmates watch?" is statistical.).
- **Videos**
  - YouTube by MooMoo Math and Science
    - Statistical Questions—Math
  - YouTube by Icon Math
    - Statistics and Statistical Questions

- YouTube by Scratch Garden
  - Data! Mini Math Movies Scratch Garden

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Statistics and Probability (SP)
CLUSTER: Use random sampling to draw inferences about a population

Standard	Performance Objectives
A.7.SP.3 Compare two sets of data within a single data display such as a picture graph, line plot, or bar graph.	**A.7.SP.3.1** Compare two sets of data within a single data display such as a picture graph, line plot, or bar graph.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.7.SP.3.1 (A) Compare two sets of data within a single data display such as a picture graph, line plot, or bar graph.	**A.7.SP.3.1** (B) Summarize one set of data within a single data display such as a picture graph, line plot, or bar graph.	**A.7.SP.3.1** (C) Identify the data categories from a given source.

Real World Connections:

- Compare weather patterns.
- Compare hobbies of classmates.
- Compare data from a science lesson.

Vocabulary

- Bar graph
- Chart
- Compare
- Data
- Distribution
- Equal
- Graph
- Less than
- Line plot
- More than
- Pictograph
- Variability

Resources:

- **Websites, articles, and other collections**
  - Engage NY, New York State Education Department (engageny.org)
    - Grade 3 Mathematics Module 6 Collecting and Displaying Data
  - Online Math Learning Resources (OnlineMathLearning.com)
    - Math Statistics: Line Graphs
    - Math Statistics: Bar Graphs
  - Teachnology, Inc.(Teach-nology.com)
    - Graphing Worksheets
  - MathGames by TeachMe (Mathgames.com)
    - Graphing Games
  - Nussbaum Education Network, LLC (mrnussbaum.com)
    - Graphing Games
- **Activities**
  - Use an object representing the data set to identify which category has more or less on a bar graph, picture graph, or line plot.
  - Use varying levels of support (LOS) to help the student understand the context of the bar graph, picture graph, or line plot. (e.g., "What does this graph show?" "What does this category represent?" "Which has more?" "Which has less?", etc.).

- Select two categories for graph comparison (e.g., students with pets vs students without pets). Count or identify the total for the first category. Use a concrete object, such as blocks snapped together, to model the total and repeat for the second category. Identify which category has more and which category has less by lining the connected blocks representing the total for each category side-by-side, end-to-end. Count the difference between the shorter blocks and the longer blocks to determine how many more or less one category has than the other.
- Use manipulatives, such as concrete items and counters, along with premade graphs. Velcro numbers and pictures may help students create their own graphs.

- **Videos**
  - YouTube by Kourtney Mcadams
    - Pictographs
  - YouTube by Math with Mr. J.
    - Reading Line Plots with Whole Numbers | Interpreting Line Plots
  - Khan Academy (khanacademy.org)
    - Reading Pictographs
    - Reading Bar Graphs: Harry Potter

No alternate standard for 7.SP.4

COURSE: Alternate Mathematics 7th Grade
DOMAIN: Statistics and Probability (SP)
CLUSTER: Investigate chance processes and develop, use, and evaluate probability models

Standard	Performance Objectives
A.7.SP.5-7 Describe the probability of events occurring as possible or impossible.	**A.7.SP.5-7.1** Describe the probability of events occurring as possible or impossible.

I Can Statements

MOST COMPLEX ⟵ ⟶ LEAST COMPLEX

A.7.SP.5-7.1 (A) Describe the probability of events occurring as possible or impossible.	**A.7.SP.5-7.1** (B) Using pictures, describe the probability of events occurring as possible or impossible.	**A.7.SP.5-7.1** (C) Using concrete items or pictures, select event(s) that are possible or impossible.

Real World Connections:

- Predict weather patterns (e.g., It is 80 degrees and sunny. What is the probability of snow?).
- Play games of chance.
- Make choices based upon random selection.

Vocabulary

- Event
- Impossible
- Outcome
- Possible
- Probability
- Sample

Resources:

- **Websites, articles, and other collections**
  - Nussbaum Education Network, LLC (mrnussbaum.com)
    - Probability Games
  - Khan Academy (khanacademy.org)
    - Probability
  - Basic Mathematics (basic-mathematics.com)
    - Coin Toss Probability
    - Understanding Probability
  - Engage NY, New York State Education Department (engageny.org)
    - Grade 7 Mathematics Module 5, Topic A, Lesson 1 Calculating and Interpreting Probabilities
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Probability
  - Mensa for Kids (mensaforkids.org)
    - Probably Probability
  - Education World (educationworld.com)
    - Explain Probability
- **Activities**
  - Use items such as coins to determine the probability of an outcome (e.g., a coin landing on heads one of two times).

- Use manipulatives (e.g., marbles, spinners, counters, coins, dice, etc.) and a chart to capture outcomes.
- Place all white marbles in a bag. Ask students if it is possible or impossible for you to pull a blue marble out of the bag.
- Play games using probability.

- **Videos**
  - YouTube by Mashup Math
    - Probability Model Math Activity!
  - YouTube by Scratch Garden
    - Probability! Mini Math Movies
  - YouTube by TutWay
    - Probability (vol-1) Likely, Most Likely, Least Likely, May Be, Never| Math | Grade-2
  - Khan Academy (khanacademy.org)
    - Unit: Probability

No alternate standard for 7.SP.8

COURSE: Alternate Mathematics 8th Grade
DOMAIN: The Number System (NS)
CLUSTER: Know that there are numbers that are not rational, and approximate them by rational numbers

Standard	Performance Objectives
A.8.NS.1 Subtract fractions with like denominators (e.g., halves, thirds, fourths, tenths) with minuends less than or equal to one.	**A.8.NS.1.1** Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.NS.1.1 (A) Subtract fractions with like denominators (halves, thirds, fourths, and tenths) with minuends less than or equal to one.	**A.8.NS.1.1** (B) Identify fractions with like denominators.	**A.8.NS.1.1** (C) Identify the numerator and the denominator of a fraction.

Real World Connections:

- Measure objects.
- Prepare recipes.
- Weigh items.
- Tell time.

Vocabulary

- Equal
- Fraction
- Like/common denominator
- Minuends
- Numerator
- Subtract
- Whole

Resources:

- **Websites, articles, and other collections**
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Subtracting Fractions
  - Toy Theater | Educational Games for Kids
    - Fraction Strips
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - Fraction Games
  - Khan Academy (khanacademy.org)
    - Understanding Fractions
  - Larson Mathematical Practices (mathematicalpractices.com)
    - Printable Manipulatives
  - Didax, Inc. (didax.com)
    - Virtual Manipulatives for Math
  - The Math Learning Center (mathlearningcenter.org)
    - Fractions for iPad, Web, and Chrome
  - MathTeacherCoach.com (mathteachercoach.com)
    - Adding and Subtracting Fractions in the Real World
- **Activities**
  - Use fraction manipulatives (each piece may be labeled with the corresponding unit fraction) to model the first fraction in the expression and remove manipulatives that represent the fraction being subtracted (i.e., ¾ - ¼ = ²/₄)

- Use fractions of motivating objects (e.g., pizza, coloring markers in a box, pieces of a building blocks set, etc.).
- Use manipulatives (e.g., Cuisenaire Rods, fraction bars, fraction circles, color tiles, geoboards, Legos, fraction pizzas, etc.).
- Incorporate technology, including computer representations, videos, animations, virtual manipulatives, and talking calculators.
- Use a token economy system that embeds fractions (e.g., "You earned ¼ of a piece of pizza. You have ¾ left to eat and then you get computer time.").
- Use real-world items with fractions (e.g., measuring cups, measuring spoons, rulers, measuring tape, etc.).

- **Videos**
  - Khan Academy (khanacademy.org)
    - Subtracting Fractions with Like Denominators
  - TeacherTube by Salem Media Group, Inc. (teachertube.com)
    - Add and Subtract Fractions with Like Denominators (Same-Size Pieces) Day 31
  - YouTube by Math-N-Roll
    - Add and Subtract Fractions with Like Denominators. Word Problems. Grade 4
  - YouTube by Math with Mr. J
    - Subtracting Fractions with Common Denominators (Step-by-Step)
  - YouTube by Alex Lochoff
    - Adding Fractions (Same Denominator)
  - YouTube by Smile and Learn—English
    - Learn to Subtract Fractions with the Same Denominator—Math for Kids
  - YouTube by tecmath
    - Fractions Subtraction Trick—The Fast Way!

COURSE: Alternate Mathematics 8th Grade
DOMAIN: The Number System (NS)
CLUSTER: Know that there are numbers that are not rational, and approximate them by rational numbers

Standard	Performance Objectives
A.8.NS.2.a Express a fraction with a denominator of 100 as a decimal.	**A.8.NS.2.a.1** Express a fraction with a denominator of 100 as a decimal (e.g., 23/100 of a dollar = $0.23, etc.)

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.NS.2.a.1 (A) Express a fraction with a denominator of 100 as a decimal (e.g., 23/100 of a dollar = $0.23, etc.)	**A.8.NS.2.a.1** (B) Match a fraction with a denominator of 100 to the corresponding decimal.	**A.8.NS.2.a.1** (C) Match coins with a decimal.

Real World Connections:

- Count money.
- Spend money.
- Measure weight.
- Take your temperature.

Vocabulary

- Coins
- Decimal
- Decimal point
- Denominator
- Fraction

Resources:

- **Websites, articles, and other collections**
  - Khan Academy (khanacademy.org)
    - Writing a Number as a Fraction and Decimal
    - Unit: Decimals
    - Understanding Fractions
  - Iknowit (Iknowit.com)
    - Fractions and Decimals (Tenths & Hundredths)
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Decimals
  - Toy Theater | Educational Games for Kids
    - Fraction Strips
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - Decimal Games
  - Larson Mathematical Practices (mathematicalpractices.com)
    - Printable Manipulatives
  - Didax, Inc. (didax.com)
    - Virtual Manipulatives for Math
  - Free Math, Handwriting and Reading Worksheets (Free-math-handwriting-and-reading-worksheets.com)
    - Decimal Place Value Chart
  - The Math Learning Center (mathlearningcenter.org)

        - Money Pieces for iPad, Chrome, and Web
    - Inch Calculator (inchcalculator.com)
        - Fraction to Decimal Calculator
- **Activities**
    - Use manipulatives and models to teach how the position of a digit after the decimal point relates to its value (e.g., A digit two places to the right of the decimal point represents 1/100, so whatever digit is in that place value position is worth that number of hundredths—a four in the hundredths place has a value of four hundredths.).
    - Teach students how to read decimals to the tenths (0.1) and hundredths (0.01) by using a place value chart (e.g., When digit cards are used to build a decimal number on a place value chart, if there is only a four in the tenths column then the number is four tenths or 0.4, and if there is a two in the tenths column and a six in the hundredths column, then altogether there are 26 hundredths or 0.26.).
    - Use a 10x10 grid and shade 10 hundredths to demonstrate 10/100. Ask students to write or select a written form for the decimal that represents 10/100. Repeat this with multiple decimals (e.g., 0.10-0.99 and then 0.01-0.09).
    - Use a place value chart to relate decimals to money amounts that are written as decimals of a dollar (e.g., The ones place represents the number of one dollar bills, the tenths place represents the number of dimes because they are 1/10 of a dollar, and the hundredths place represents the number of pennies because they are 1/100 of a dollar.).
    - Teach students to use a calculator to convert a fraction to a decimal.
- **Videos**
    - YouTube by Math with Mr. J
        - Subtracting Fractions with Common Denominators (Step-by-Step)
        - Decimal Models: Hundredths
    - YouTube by Mary Anne Fowler
        - Decimals Intro—BrainPOP
    - YouTube by True Curriculum
        - What is a Decimal?

COURSE: Alternate Mathematics 8th Grade
DOMAIN: The Number System (NS)
CLUSTER: Know that there are numbers that are not rational, and approximate them by rational numbers

Standard	Performance Objectives
A.8.NS.2.b Compare quantities represented as decimals in real-world examples to the hundredths place.	**A.8.NS.2.b.1** Compare quantities represented as decimals in real-world examples to the hundredths place.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.NS.2.b.1 (A) Compare quantities represented as decimals in real-world examples to the hundredths place.	**A.8.NS.2.b.1** (B) Given a picture of two quantities representing decimals to the hundredths place, select the corresponding decimals.	**A.8.NS.2.b.1** (C) Match a decimal to the hundredths place to a corresponding picture.

Real World Connections:

- Count money.
- Spend money.
- Measure weight.
- Take your temperature.
- Measure with ruler or yardstick.

Vocabulary

- Compare
- Decimal
- Decimal point
- Equal
- Greater than
- Hundredths
- Less than
- Place value

Resources:

- **Websites, articles, and other collections**
  - Khan Academy (khanacademy.org)
    - Comparing Decimals (Tenths and Hundredths)
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Ordering Decimals
  - Toy Theater | Educational Games for Kids
    - Fraction Strips
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - Decimal Games
  - Khan Academy (khanacademy.org)
    - Understanding Fractions
  - Larson Mathematical Practices (mathematicalpractices.com)
    - Printable Manipulatives
  - Didax, Inc. (didax.com)
    - Virtual Manipulatives for Math
  - Math Tech Connections Inc. (mathtechconnections.com)
    - Using Money to Help You Compare Decimals
  - The Math Learning Center (mathlearningcenter.org)

- Money Pieces for iPad, Chrome, and Web
- Inch Calculator (inchcalculator.com)
  - Fraction to Decimal Calculator
- **Activities**
  - Use two place value charts—lined up directly above and below each other—to model decimal numbers to the tenths or hundredths place with digit cards or base-10 blocks. Have the student compare the values of the digits starting with the greatest place value position in order to identify which decimal is greater and which is lesser.
  - Relate decimals to money amounts that are written as decimals of a dollar and have students determine which money amount is greater and which is lesser. Model with play money or real money.
- **Videos**
  - YouTube by Adrian Smallwood
    - Comparing Decimals
  - YouTube by Education Galaxy
    - 4th Grade—Math—Compare and Order Decimals—Topic Overview Part 1 of 2
  - YouTube by icon Math
    - Comparing Decimals to Hundredths Using Visual Models
  - YouTube by Yours in Education
    - Represent Decimals to the Hundredths Using Money and Decimal Models

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Expressions and Equations (EE)
CLUSTER: Work with radicals and integer exponents

Standard	Performance Objectives
A.8.EE.1 Identify the meaning of an exponent (limited to exponents of 2 and 3).	**A.8.EE.1.1** Identify the meaning of an exponent (limited to exponents of 2 and 3).

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.EE.1.1 (A) Identify the meaning of an exponent (limited to exponents of 2 and 3).	**A.8.EE.1.1** (B) Identify the meaning of an exponent (limited to exponents of 2).	**A.8.EE.1.1** (C) Recognize an exponent.

Real World Connections:

- Use exponents to write a large number.
- Use exponents to calculate the area of a room.
- Use exponents to calculate the area of a square.

Vocabulary

- Area
- Exponent
- Meaning
- Number

Resources:

- **Websites, articles, and other collections**
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Exponents
  - Khan Academy.(khanacademy.org)
    - Exponent Example 1
    - Exponent Example 2
    - Place Value Blocks
  - Lumen Learning (courses.lumenlearning.com)
    - Module 4: Exponents
  - Midwest Center for Lifelong Learning in Public Health, University of Minnesota (mclph.umn.edu)
    - Math Review: Useful Math for Everyone—Section 3. What is an Exponent?
  - Online Math Learning Resources (OnlineMathLearning.com)
    - Introduction to Exponents
- **Activities**
  - Find the area of your classroom, the top of your desk, etc.
  - Compose and decompose numbers to three digits (e.g., 300+50+7=_____, 57=_____+_____, etc.).
  - Show that 12 is one 10 and two ones, 12 ones, seven ones and five ones, etc.
  - Use models to represent the composition of numbers. Illustrate a number using models.
  - Model numbers using base-10 blocks.
- **Videos**
  - LearnZillion (learnzillion.com)

- Model and Write Numbers Using Base-10 Blocks
- YouTube by eHow
  - Math Definitions: What is an Exponent?
- Study.com (study.com)
  - What are Exponents? Definition, Properties, & Rules
- YouTube by Jake the Math Guy
  - Exponents in the Real World

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Expressions and Equations (EE)
CLUSTER: Work with radicals and integer exponents

Standard	Performance Objectives
A.8.EE.2 Identify a geometric sequence of whole numbers with a whole number common ratio.	**A.8.EE.2.1** Recognize that a geometric sequence is a sequence where each number is found by multiplying or dividing the same value from one number to the next.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.EE.2.1 (A) Recognize that a geometric sequence is a sequence where each number is found by multiplying or dividing the same value from one number to the next.	**A.8.EE.2.1** (B) Given a geometric sequence and the rule, find the missing numbers.	**A.8.EE.2.1** (C) Create a geometric sequence using a common whole number (e.g., 1×2=2, 2×2=4, 4×2=8, 8×2=16, etc.).

Real World Connections:

- Count quickly by knowing the rule.
- Calculate the missing number.
- Calculate interest earned.
- Given the rate of travel, apply the formula to determine the number of miles a vehicle travels in a given amount of time and the formula to calculate the distance at any time along the trip.

Vocabulary

- Common ratio
- Geometric sequence
- Sequence
- Whole number

Resources:

- **Websites, articles, and other collections**
  - CK-12 Foundation(ck12.org)
    - Geometric Sequences
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Geometric Sequences and Sums
  - Mathematics Educators Beta (matheducators.stackexchange.com)
    - Examples of arithmetic and geometric sequences and series in daily life
  - Basic Mathematics (basic-mathematics.com)
    - Geometric Sequence
- **Activities**
  - If there are two worms for every bird, how many worms would three birds get?
  - Complete a ratio table.
  - Complete the ratio table with symbols or objects.
  - Bead a necklace with a given ratio (e.g., three red beads, four yellow beads, three red beads, etc.).
- **Videos**
  - YouTube by Brian McLogan

- Learning to Find the Ratio of a Geometric Sequence
- Khan Academy (khanacademy.org)
  - Intro to Geometric Sequences
  - Geometric Sequence Review
- Study.com (study.com)
  - Common Ratio: Definition & Concept

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Expressions and Equations (EE)
CLUSTER: Work with radicals and integer exponents

Standard	Performance Objectives
A.8.EE.3-4 Compose and decompose whole numbers up to 999.	**A.8.EE.3-4.1** Compose and decompose whole numbers up to 999 (e.g., 300+40+4=344).

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.EE.3-4.1 (A) Compose and decompose whole numbers up to 999 (e.g., 300+40+4=344).	**A.8.EE.3-4.1** (B) Using concrete examples, compose and decompose whole numbers up to 100 in more than one way.	**A.8.EE.3-4.1** (C) Complete a graphic organizer for a given number (e.g., place value chart).

Real World Connections:

- Count and separate money.
- Help students with addition, subtraction, multiplication, and division.
- Perform an essential math skill for calculating.
- Learn about numbers and their parts.
- Learn how to make a number by joining other numbers or groups together and how to break numbers down to their parts.

Vocabulary

- Compose
- Decompose
- Expanded form
- Standard form

Resources:

- **Websites, articles, and other collections**
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Composing and Decomposing Numbers
  - Mathematically Minded, LLC (therecoveringtraditionalist.com)
    - Composing and Decomposing Numbers
  - Math 4 Texas Education Service Center Region 11 (Math4texas.org)
    - Concrete & Pictorial Models to Compose & Decompose Numbers to 1,200
  - WikiHow (wikihow.com)
    - How to Decompose Numbers
- **Activities**
  - Use concrete and pictorial models to compose and decompose numbers up to 999 in more than one way as a sum of so many hundreds, tens, and ones.
  - Given a number over 50, use place value blocks to indicate the value of each digit.
  - Use popsicle sticks with beans glued to them in groups of 10 and loose beans to illustrate a multi-digit number.
  - Show a number on the number line and answer the number of tens and ones in the given number.
  - Decompose numbers to 999 in multiple ways (e.g., The number 36 is three 10s and six ones, two 10s and 16 ones, or 36 ones.).
- **Videos**
  - YouTube by Oxford Owl—Learning at Home

- What is Composing and Decomposing Numbers?
- YouTube by Erica Jousan
  - Decomposing Numbers in Multiple Ways—Grade 2
- YouTube by Build Math Minds
  - Composing and Decomposing Numbers
- LearnZillion (learnzillion.com)
  - Decompose and Compose Numbers

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Expressions and Equations (EE)
CLUSTER: Understand the connections between proportional relationships, lines, and linear equations

Standard	Performance Objectives
A.8.EE.5-6 Graph a simple ratio by connecting the origin to a point representing the ratio in the form of y/x. (e.g., when given a ratio in standard form [2:1], convert to 2/1 and plot the point [1,2]).	**A.8.EE.5-6.1** Graph a simple ratio by connecting the origin to a point representing the ratio in the form of y/x. (e.g., when given a ratio in standard form [2:1], convert to 2/1 and plot the point [1,2]).

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.EE.5-6.1 (A) Graph a simple ratio by connecting the origin to a point representing the ratio in the form of y/x. (e.g., when given a ratio in standard form [2:1], convert to 2/1 and plot the point [1,2])..	**A.8.EE.5-6.1** (B) Convert a ratio to a point (e.g., when given a ratio in standard form (2:1), convert to the point (1,2)	**A.8.EE.5-6.1** (C) Identify the X axis and the Y Axis.

Real World Connections:

- Graph attributes in a zoo.
- Read and plot coordinates on a map.
- Graph a simple ratio using the x- and y-axis points.
- Use a standard multiplication chart to find the product of two numbers using coordinate skills.
- Place or locate data on a simple two-category graph.
- Use a distance landmark to tell if something is close or far away.
- Locate objects on a map (with or without coordinates).

Vocabulary

- Convert
- Origin
- Point
- Ratio
- Standard form
- X-axis
- Y-axis

Resources:

- **Websites, articles, and other collections**
  - MathBits.com (mathbitsnotebook.com)
    - Proportional Relationships
  - Mason Public Schools, Mason, Michigan (masonk12.net)
    - Ratios and Proportional Relationships
  - Lumen Learning (courses.lumenlearning.com)
    - 1.3—Coordinate Plane and Graphing Equations
  - Math Planet (mathplanet.com)
    - Linear Equations in the Coordinate Plane
- **Activities**
  - Graph a simple ratio in standard form (e.g., 2;1) using the x- and y-axis points and expand on the ratio by two or more points.
  - Given a ratio of 2:1 (e.g., two balloons for every child), graph the linear equation on a graph labeled with the x-axis and y-axis. This equation would have a slope of two.

- Given there is one boy for every one girl, graph points for the ratio of 1:1 (This linear equation will have a slope of one.).
- Given two plotted data points, plot a third point using pictures.
- Given a ratio of 3:1, indicating that each student needs three items, convert the ratio to fraction form (2/1) and plot this point and two additional points that are functions of the original ratio (e.g., 3:1, 6:2, 9:3) on a prelabeled graph.
- Given a ratio of 3:1, indicating that each student needs three items, guide students in converting the ratio to fraction form (2/1) and plot it on a prelabeled graph.

- **Videos**
  - Khan Academy (khanacademy.org)
    - Proportional Relationships
    - Ratios on Coordinate Plane
    - Identifying Proportional Relationships from Graphs
  - Varsity Tutors (Varsitytutors.com)
    - Proportional Relationships

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Expressions and Equations (EE)
CLUSTER: Analyze and solve linear equations and pairs of simultaneous linear equations

Standard	Performance Objectives
A.8.EE.7 Solve simple algebraic equations with one variable using addition and subtraction.	**A.8.EE.7.1** Solve simple algebraic expressions using addition and subtraction.

I Can Statements

MOST COMPLEX ⟵ ⟶ LEAST COMPLEX

A.8.EE.7.1 (A) Solve simple algebraic expressions using addition and subtraction.	**A.8.EE.7.1** (B) Identify the inverse/opposite operation in an equation.	**A.8.EE.7.1** (C) Identify the operation in an equation.

Real World Connections:

- Determine how many students are absent.
- Figure out how much money is missing.
- Balance your savings account statement.

Vocabulary

- Addition
- Algebraic equation
- Variable
- Subtraction

Resources:

- **Websites, articles, and other collections**
  - Ducksters (ducksters.com)
    - Kids Math: Solving Algebra Equations with Addition and Subtraction
  - Purplemath, Inc. (purplemath.com)
    - Solving One-Step Linear Equations: Adding & Subtracting
  - Math Worksheets 4 Kids (mathworksheets4kids.com)
    - Solving One-Step Equation Worksheets
  - Math Idea Galaxy (ideagalaxyteacher.com)
    - 12 One-Step Equation Activities That are Out of This World
- **Activities**
  - Solve algebraic expressions using simple addition and subtraction. Mark had $10 and needs $15. How many more dollars does he need?
  - Given a set of basketballs, two in a bag and five outside the bag, solve to find the total number of basketballs in the set
  - Find the difference when given the total and the solution (e.g., A student has 10 chocolate chips and a bag of chocolate chips. Solve for the amount the bag contains when the total number of chocolate chips is 25.).
  - Play a game in which students roll two dice and add up the dots (dice with dots or dice with numerals).
  - Use a pictorial representation of numbers to solve addition and subtraction problems (e.g., three balloons minus one balloon).
- **Videos**
  - Khan Academy (khanacademy.org)
    - One-Step Addition & Subtraction Equations
  - YouTube by Brian McLogan
    - How to Solve an Equation Using the Addition Property of Equality
  - YouTube by Math and Science

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Expressions and Equations (EE)
CLUSTER: Analyze and solve linear equations and pairs of simultaneous linear equations

- 01—Solve One-Step Equations with Addition and Subtraction, Part 1
- Algebra 1 Unit 3 Lesson 2 Solve Single-Step Equations with Addition and Subtraction, Part 2

- YouTube by Anywhere Math
  - Solving Equations Using Addition or Subtraction

No alternate standard for 8.EE.8

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Functions (F)
CLUSTER: Define, evaluate, and compare functions

Standard	Performance Objectives
A.8.F.1-3 Given a function table containing at least two complete ordered pairs, identify a missing number that completes another ordered pair (limited to linear functions).	**A.8.F.1-3.1** Identify the missing number that completes an ordered pair in a function table.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.F.1-3.1 (A) Identify the missing number that completes an ordered pair in a function table.	**A.8.F.1-3.1** (B) Verify the rule with the given ordered pair in a function table.	**A.8.F.1-3.1** (C) Recognize the rule in a function table.

Real World Connections:

- Use a function table to determine how much money to save.
- Use a function table to determine how many books you can read in a month if you read two books per day.

Vocabulary

- Decrease
- Function table
- Increase
- Input (x)
- Ordered pair
- Output (y)
- Pattern
- Rule

Resources:

- **Websites, articles, and other collections**
  - CK-12 Foundation(ck12.org)
    - 7.16 Input-Output Tables for Function Rules
  - Math-Aids.Com (math-aids.com)
    - Function Table Worksheets
  - Scholastic Inc. (studyjams.scholastic.com)
    - Function Tables
- **Activities**
  - Use function table worksheets and in-out boxes to practice computing the outputs for different rules and equations.
  - Have a school fundraiser (e.g., a carwash). Keep track of the number of cars washed each hour from 9 a.m. to 1 p.m. The number of cars washed is connected to the number of hours worked. One is a function of the other. Look at the list and write a function rule, then figure out how many cars would be washed in the fifth hour of the car wash.
- **Videos**
  - YouTube by Math with Mr. J
    - Input and Output Tables (Function Tables) | Adding and Subtracting
  - YouTube by Math Songs by NUMBEROCK
    - Input Output Tables Song | 4th Grade | Finding the Rule of a Function

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Functions (F)
CLUSTER: Use functions to model relationships between quantities

Standard	Performance Objectives
A.8.F.4 Determine the values or rules of a function using a graph or a table.	**A.8.F.4.1** Determine the values or rule of a function using a graph or a table.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.F.4.1 (A) Determine the values or rule of a function using a graph or a table.	**A.8.F.4.1** (B) Determine the amount that the values of the function are increasing or decreasing.	**A.8.F.4.1** (C) Identify if the values of the function are increasing or decreasing.

Real World Connections:

- Use a function table to determine how much money to save.
- Use a function table to determine how many books you can read in month if you read two books per day.

Vocabulary

- Covariation
- Decrease
- Function table
- Increase
- Input (x)
- Ordered pair
- Output (y)
- Pattern
- Rule

Resources:

- **Websites, articles, and other collections**
  - Education World (educationworld.com)
    - Functions in the Real World
  - Scholastic Inc. (studyjams.scholastic.com)
    - Function Tables
  - Education.com (education.com)
    - Input/Output Tables
    - Fun, Fun Function Tables
  - Fishtank Learning Inc. (fishtanklearning.org)
    - Functions Lesson 2
  - Desmos (teacher.desmos.com)
    - Guess My Rule
- **Activities**
  - Set up a function machine. An input goes in, something happens to it inside the machine, and an output comes out. Another input goes in and another output comes out. What's going on inside the machine? If we know the machine's function rule (or rules) and the input, we can predict the output. If we know the rule (or rules) and an output, we can determine the input. We also can imagine the machine asking, "What's my rule?" If we examine the inputs and outputs, we should be able to figure out the mystery function rule or rules.
  - Set up a large cardboard box with input and output slots. One student sits inside the function machine with a mystery function rule. As

other students take turns putting numbers into the machine, the student inside the box sends output numbers through the output slot. After two or more inputs and outputs, the class usually can understand the mystery function rule.

- **Videos**
  - Math Playground LLC (mathplaygroudn.com)
    - Function Machine
  - YouTube by Kids Academy
    - Input and Output Tables | Find the Rule| Math for 1st Grade
  - YouTube by Tracy Harris
    - Finding the Rule for Function Machine
  - YouTube by Matthew Anderson
    - Finding the Rule for the Pattern

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Functions (F)
CLUSTER: Use functions to model relationships between quantities

Standard	Performance Objectives
A.8.F.5 Describe how a graph represents a relationship between two quantities.	**A.8.F.5.1** Describe a relationship between two quantities shown on a graph using increasing, decreasing, or maintaining.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.F.5.1 (A) Describe a relationship between two quantities shown on a graph using increasing, decreasing, or maintaining.	**A.8.F.5.1** (B) Locate the two quantities of data on the y-axis in a graph.	**A.8.F.5.1** (C) Locate the data on the x-axis in a graph.

Real World Connections:

- Use a line graph to determine gains in height or weight.
- Interpret a graph to determine change in something over time.
- Use a graph to interpret weather patterns.
- Use a graph to determine the relationship between two things (e.g., the number of hours worked related to the rate of pay).

Vocabulary

- Data
- Decreasing
- Function
- Graph
- Increasing
- Maintaining
- Ordered pairs
- Proportional
- X-axis
- Y-axis

Resources:

- **Websites, articles, and other collections**
  - Study.com (study.com)
    - Functional Relationships
  - Khan Academy (khanacademy.org)
    - Identifying Proportional Relationships from Graphs
    - Unit: Rates and Proportional Relationships
  - Lumen Learning (courses.lumenlearning.com)
    - Determine whether a linear function is increasing, decreasing, or constant.
- **Activities**
  - Teach that a coordinate grid has two perpendicular lines, or axes, labeled like number lines. Have students make and label their own grids with graph paper and Wikki Stix.
  - Provide multiple examples of line graphs with increasing, decreasing, and maintaining relationships.
  - Use grid paper with raised lines, Wikki Stix, models, T-charts, rulers, colored pencils, and highlighters.
- **Videos**
  - Study.com (study.com)
    - Graph Functions by Plotting Points
  - YouTube by Dylan Peters EDU
    - Topic 16.3 Patterns and Graphing

- YouTube by Icon Math
  - Graphs for Patterns
- YouTube by Melissa Pancer
  - Patterns in Graphs and Tables

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Geometry (G)
CLUSTER: Understand congruence and similarity using physical models, transparencies, or geometry software

Standard	Performance Objectives
A.8.G.1 Recognize translations, rotations, and reflections of shapes.	**A.8.G.1.1** Identify translations, rotations, and reflections of shapes.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.G.1.1 (A) Identify translations, rotations, and reflections of shapes.	**A.8.G.1.1** (B) Match rotations and translations of shapes.	**A.8.G.1.1** (C) Select a translation of a shape.

Real World Connections:

- Recognize street signs based upon their geometric shape.
- Find geometric shapes in architecture and drafting.
- Locate geometric shapes in construction that have certain conditions.
- Compare geometric shapes found in the design of buildings.

Vocabulary

- Reflection
- Rotation
- Shape
- Translation

Resources:

- **Websites, articles, and other collections**
  - Online Math Learning Resources (OnlineMathLearning.com)
    - Reflection, Rotation, and Translation
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Transformations
    - Rotation
    - Reflection
    - Translation
  - Brainfuse (brainfuse.com)
    - Transformations
  - Math Planet (mathplanet.com)
    - Common Types of Transformation
  - Class Ace (classace.io)
    - Learn About Reflection, Rotation, and Translation
  - Alamandamaths.com
    - Describe Translations Reflections and Rotations of 2D Shapes on the Cartesian Plane
  - Math Worksheets 4 Kids (mathworksheest4kids.com)
    - Transformation Worksheets: Translation, Reflection, and Rotation
- **Activities**
  - Make and laminate larger shapes that students can manipulate.
- **Videos**
  - TurtleDiary (turtlediary.com)

- Describing Transformations
- Study.com (study.com)
  - Reflection, Rotation, and Translation
- Khan Academy (khanacademy.org)
  - Translations Intro
  - Identifying Transformations
  - Rotations Intro
  - Determining Reflections

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Geometry (G)
CLUSTER: Understand congruence and similarity using physical models, transparencies, or geometry software

Standard	Performance Objectives
A.8.G.2 Identify shapes that are congruent.	**A.8.G.2.1** Match shapes that are congruent (i.e., They are exactly the same shape and size, but they do not have to face the same direction.).

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.G.2.1 (A)Match shapes that are congruent (i.e., They are exactly the same shape and size, but they do not have to face the same direction.).	**A.8.G.2.1** (B) Select shapes that are the same size.	**A.8.G.2.1** (C) Select shapes that are exactly the same.

Real World Connections:

- Observe mirror images.
- Notice congruency found in drawings and graphic design.

Vocabulary

- Congruent
- Equal
- Exact
- Mirror image

Resources:

- **Websites, articles, and other collections**
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Congruent
    - Similar
  - Tutors.com (tutors.com)
    - Congruent Figures—Definition, Shapes & Examples
  - Mometrix Test Preparation (Mometrix.com)
    - What is a Congruent Shape?
  - Class Ace (classace.io)
    - Congruent Shapes
  - Beacon Learning Center (beaconlearningcenter.com)
    - Congruent Concentration
  - BrainPOP Jr. (jr.brainpop.com)
    - Congruent and Similar Shapes
- **Activities**
  - Have students use a 100-square grid to create their own interesting pattern. Have students share their designs with classmates and find out if they see an illusion when looking at the pattern. Notice any congruent and similar shapes in the pattern.
- **Videos**
  - YouTube by Turtlediary
    - Congruent Shapes—Math Lesson for 2nd Graders

- YouTube by BespokeEducation
  - Congruent Shapes
- YouTube by Don't Memorise
  - What are Congruent Figures?

No alternate standard for 8.G.3

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Geometry (G)
CLUSTER: Understand congruence and similarity using physical models, transparencies, or geometry software

Standard	Performance Objectives
A.8.G.4 Identify similar shapes with and without rotation.	**A.8.G.4.1** Identify similar shapes with and without rotation.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.G.4.1 (A) Identify similar shapes with and without rotation.	**A.8.G.4.1** (B) Identify similar shapes with rotation.	**A.8.G.4.1** (C) Identify the same shape.

Real World Connections:

- Recognize street signs based upon their geometric shape.
- Find geometric shapes in architecture and drafting.
- Locate geometric shapes in construction that have certain conditions.
- Compare geometric shapes found in the design of buildings.

Vocabulary

- Rotation
- Shapes
- Similar

Resources:

- **Websites, articles, and other collections**
  - Mr. Barton's Maths (mrbartonmaths.com)
    - 2D Similar Shapes: Worksheets and Answers
  - Basic Mathematics (basic-mathematics.com)
    - Similar Shapes
  - GreatSchools.org (greatschools.org)
    - Similar Shapes
  - K5 Learning (k5learning.com)
    - Worksheets: Matching Similar Shapes
  - Online Math Learning Resources (OnlineMathLearning.com)
    - Reflection, Rotation, and Translation
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Rotation
  - Brainfuse (brainfuse.com)
    - Transformations
  - Math Planet (mathplanet.com)
    - Common Types of Transformation
  - Class Ace (classace.io)
    - Learn About Reflection, Rotation, and Translation
  - Alamandamaths.com
    - Describe Translations Reflections and Rotations of 2D Shapes on the Cartesian Plane

- Math Worksheets Land (mathworksheetsland.com)
  - Understanding Congruent Shapes
- Math Worksheets 4 Kids (mathworksheest4kids.com)
  - Transformation Worksheets: Translation, Reflection, and Rotation

- **Activities**
  - Supply objects that can be rotated by the student.
  - Compare to the rotation of the earth.
  - Make and laminate shapes that students can manipulate.
- **Videos**
  - YouTube by FuseSchool—Global Education
    - Similar Shapes | Geometry | Maths
  - TurtleDiary (turtlediary.com)
    - Describing Transformations
  - Study.com (study.com)
    - Reflection, Rotation, and Translation
  - YouTube by Shmoop
    - Similar Figures
  - YouTube by Mashup Math
    - Difference Between Similar & Congruent Figures?
  - Khan Academy (khanacademy.org)
    - Identifying Transformations
    - Rotations Intro

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Geometry (G)
CLUSTER: Understand congruence and similarity using physical models, transparencies, or geometry software

Standard	Performance Objectives
A.8.G.5 Compare any angle to a right angle and describe the angle as greater than, less than, or congruent to a right angle.	**A.8.G.5.1** Compare any angle to a right angle and describe the angle as greater than, less than, or congruent to a right angle.

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.G.5.1 (A) Compare any angle to a right angle and describe the angle as greater than, less than, or congruent to a right angle.	**A.8.G.5.1** (B) Select angles that are greater than, less than, or equal to a given right angle.	**A.8.G.5.1** (C) Recognize a right angle.

Real World Connections:

- Notice angles such as in spider webs, the letters in your name, and building/architecture/construction.
- Cut a pizza into slices and notice the angles.
- Recognize angles used in drawing.
- Notice angles found in construction or architecture.

Vocabulary

- Acute
- Angle
- Figure
- Obtuse angle
- Right angle

Resources:

- **Websites, articles, and other collections**
  - Dorling Kindersley Limited (dkfindout.com)
    - Angles
  - Jumpstart Games, Inc.—Math Blaster (mathblaster.com)
    - Angles
  - Teacher's Pet (tpet.co.uk)
    - Angles
  - Math Worksheets 4 Kids (mathworksheest4kids.com)
    - Identifying Acute, Right, and Obtuse Angles Worksheets
  - SplashLearn by Studypad, Inc. (splashlearn.com)
    - Angle—Definition with Examples
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - Right Angles
  - Education.com (education.com)
    - Classifying Angles Resources
    - Lesson Plan—All About Angles
    - Worksheet—Shapes with Right Angles
  - Helping with Math (helpingwithmath.com)
    - Measuring Angles

- **Activities**
  - Using two line segments and a brad, create a movable angle and allow students to measure angles found in the classroom.
  - Draw an angular picture of a dog or cat and have students identify and describe the angles as greater than, less than, or congruent to a right angle.
  - Once students understand what an angle is, challenge them to find and sort angles (i.e., smaller/larger).
  - Set up themed stations around the room with photographs of items (e.g., aquarium, at the park, amusement park, in the city, at the beach, etc.). Make a worksheet with matching pictures of the photographs for students to use to find and identify angles in the photographs. Provide students with colored pencils or thin-tipped markers to record the angles on the worksheet's pictures.
- **Videos**
  - YouTube by Clarendon Learning
    - Angles for Kids—An Intro Into the World of Angles
  - YouTube by Free School
    - Intro to Angles for Kids: Understanding Angles for Children
  - YouTube by NUMBEROCK
    - Angles Song | Acute, Obtuse, & Right Angles | 3rd & 4th Grade
  - YouTube by Smile and Learn—English
    - Angles—Types and Definition—Mathematics for Kids
  - EG Videos (egvideos.com)
    - New York—Grade 4—Math—Measurement and Data—Angles—4.MD.5
  - YouTube by Math Songs by NUMBEROCK
    - Angles Song | Acute, Obtuse, & Right Angles | 3rd & 4th Grade
  - YouTube by Khan Academy
    - Recognizing Angles | Geometry | 4th Grade
    - Shapes and Angles
  - YouTube by Alton Price
    - Where are the Largest and Smallest Angles in Triangles?
  - Khan Academy (khanacademy.org)
    - Identify the Angle
    - Recognizing Angles

No alternate standard for 8.G.6-8

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Geometry (G)
CLUSTER: Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres

Standard	Performance Objectives
A.8.G.9 Use the formulas for perimeter, area, and volume to solve real-world and mathematical problems (limited to perimeter and area of rectangles and volume of rectangular prisms).	**A.8.G.9.1** Apply knowledge of perimeter to solve real world mathematical problems when given the formula (L+L+W+W=P). **A.8.G.9.2** Apply knowledge of area to solve real world mathematical problems when given the formula (LxW=A). **A.8.G.9.3** Apply knowledge of volume to solve real world mathematical problems when given the formula (LxHxW=V).

I Can Statements

MOST COMPLEX ⟷ LEAST COMPLEX

A.8.G.9.1 (A) Apply knowledge of perimeter to solve real world mathematical problems when given the formula (L+L+W+W=P).	**A.8.G.9.1** (B) Find the measurements of the perimeter of rectangles.	**A.8.G.9.1** (C) Given a real world problem, identify the length and the width.
A.8.G.9.2 (A) Apply knowledge of area to solve real world mathematical problems when given the formula (LxW=A).	**A.8.G.9.2** (B) Find the measurements of the area of rectangles.	**A.8.G.9.2** (C) Given a real world problem, identify the length and the width.
A.8.G.9.3 (A) Apply knowledge of volume, to solve real world mathematical problems when given the formula (LxHxW=V).	**A.8.G.9.3** (B) Find the measurements of the volume of rectangular prisms.	**A.8.G.9.3** (C) Given a real world problem, identify the length, height, and width.

Real World Connections:

- Measure the area of a garden.
- Determine the area needed to construct a building.
- Measure to figure out whether a piece of carpet will fit in your bedroom.
- Use standard units for permitter, area, and volume to measure drawings and objects.
- Increase spatial awareness.

Vocabulary

- Area
- Formula
- Grid
- Length
- Perimeter
- Rectangle
- Rectangular prism
- Volume
- Width

Resources:

- **Websites, articles, and other collections**
  - EasyTeacherWorksheets.com (Easyteacherworksheets.com)
    - Area, Perimeter, and Volume
  - Teachers Pay Teachers (teacherspayteachers.com)—subscription required
    - Free Perimeter, Area & Volume Word Wall—20 words
    - Free Volume Area Perimeter Worksheet

        - Perimeter, Area, and Volume Freebie
    - Common Sense Education(commonsense.org)
        - Perimeter and Area Real-World Practice
    - Class Ace (Classace.io)
        - Learn About Area
    - Education.com (education.com)
        - Online Game: Alfalfa's Out of the Box: Perimeter, Area, and Addition
    - Math Worksheets 4 Kids (mathworksheets4kids.com)
        - Volume by Counting Cubes Worksheets
    - Math Worksheets Land (mathworksheetsland.com)
        - Measuring Volume with Unit Cubes—Step-by-Step Lesson
    - XP Math (xpmath.com)
        - Minecraft Volume: Rectangular Prism
- **Activities:**
    - Find the perimeter of a square or rectangle by adding side lengths.
    - Count unit squares to find the area of a square or rectangle.
    - Find the volume of a rectangular prism in various cubic units by filling it with unit cubes and counting them or counting the number of unit cubes in one layer and multiplying by the number of layers.
    - Have students fill a room on paper with furniture to see if they can make it all fit.
- **Videos**
    - YouTube by talkboard
        - Perimeter, Area, and Volume
    - YouTube by Rachna Sagar
        - Perimeter, Area, and Volume
    - YouTube by tecmath
        - Area, Perimeter, and Volume of Rectangle
    - Khan Academy (khanacademy.org)
        - Counting Unit Squares to Find Area Formula
        - Transitioning from Unit Squares to Area Formula
    - YouTube by mathantics
        - Math Antics—Area
    - YouTube by EasyTeaching
        - An Introduction to Area | Teaching Maths
    - YouTube by #kispride
        - Minecraft in Education: Finding Volume by Adding Layers (5th Grade Technology Integration)
    - Khan Academy (khanacademy.org)

- Measuring Volume with Unit Cubes
- YouTube by Icon Math
  - Measuring Volume by Counting Unit Cubes
- Help Teaching—Sunstone Education (helpteaching.com)
  - Measuring Volume with Unit Cubes
- YouTube by Math with Mr. J
  - Finding Volume with Unit Cubes | How to Find Volume

No alternate standard for 8.SP.1-3

COURSE: Alternate Mathematics 8th Grade
DOMAIN: Statistics and Probability (SP)
CLUSTER: Investigate patterns of association in bivariate data

Standard	Performance Objectives
A.8.SP.4 Construct a graph or table from given categorical data and compare data categorized in the graph or table.	**A.8.SP.4.1** Choose a graph or table from given categorical data and compare data categorized in the graph or table.

I Can Statements

MOST COMPLEX ⟵ ⟶ LEAST COMPLEX

A.8.SP.4.1 (A) Choose a graph or table from given categorical data and compare data categorized in the graph or table.	**A.8.SP.4.1** (B) Select the graph or table from given categorical data.	**A.8.SP.4.1** (C) Identify data in a graph or table.

Real World Connections:

- Compare the nutrient labels on two boxes of cereal.
- Compare prices while shopping.
- Conduct a science project collecting and graphing data.

Vocabulary

- Categorical data
- Compare
- Graph
- Table
- X-axis
- Y-axis

Resources:

- **Websites, articles, and other collections**
  - Khan Academy (Khanacademy.org)
    - Reading Bar Graphs: Harry Potter
  - Math is Fun by Rod Pierce (Mathsisfun.com)
    - How to Do a Survey
    - Categorical Data
  - Engage NY, New York State Education Department (engageny.org)
    - Grade 3 Mathematics Module 6, Topic A Generate and Analyze Categorical Data A
- Activities
  - Use graphs or tables to compare the number of ice cream cones sold to the temperature on that day. (i.e., Are more ice cream cones sold on warm days?).
- Videos
  - YouTube by Michelle Hopkin
    - Categorical and Numerical Data
  - YouTube by ingy fahmy
    - Tally Charts and Bar Graphs—BrainPOP Jr.
  - YouTube by Math with Mr. J
    - Reading Line Plots with Whole Numbers | Interpreting Line Plots

- YouTube by Agelyn Ong
  - Line Graphs