Standards for Mathematical Practices – Grade 4

The Common Core State Standards for Mathematical Practice are expected to be integrated into every mathematics lesson for all students Grades K-12. Below are a few examples of how these Practices may be integrated into tasks that students complete.

Mathematic Practices	Explanations and Examples
1. Make sense of problems and persevere in solving them.	Mathematically proficient students in grade 4 know that doing mathematics involves solving problems and discussing how they solved them. Students explain to themselves the meaning of a problem and look for ways to solve it. Fourth graders may use concrete objects or pictures to help them conceptualize and solve problems. They may check their thinking by asking themselves, "Does this make sense?" They listen to the strategies of others and will try different approaches. They often will use another method to check their answers.
2. Reason abstractly and quantitatively.	Mathematically proficient fourth graders should recognize that a number represents a specific quantity. They connect the quantity to written symbols and create a logical representation of the problem at hand, considering both the appropriate units involved and the meaning of quantities. They extend this understanding from whole numbers to their work with fractions and decimals. Students write simple expressions, record calculations with numbers, and represent or round numbers using place value concepts.
3. Construct viable arguments and critique the reasoning of others.	In fourth grade mathematically proficient students may construct arguments using concrete referents, such as objects, pictures, and drawings. They explain their thinking and make connections between models and equations. They refine their mathematical communication skills as they participate in mathematical discussions involving questions like "How did you get that?" and "Why is that true?" They explain their thinking to others and respond to others' thinking.
4. Model with mathematics.	Mathematically proficient fourth grade students experiment with representing problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, making a chart, list, or graph, creating equations, etc. Students need opportunities to connect the different representations and explain the connections. They should be able to use all of these representations as needed. Fourth graders should evaluate their results in the context of the situation and reflect on whether the results make sense.
5. Use appropriate tools strategically.	Mathematically proficient fourth graders consider the available tools (including estimation) when solving a mathematical problem and decide when certain tools might be helpful. For instance, they may use graph paper or a number line to represent and compare decimals and protractors to measure angles. They use other measurement tools to understand the relative size of units within a system and express measurements given in larger units in terms of smaller units.
6. Attend to precision.	As fourth graders develop their mathematical communication skills, they try to use clear and precise language in their discussions with others and in their own reasoning. They are careful about specifying units of measure and state the meaning of the symbols they choose. For instance, they use appropriate labels when creating a line plot.
7. Look for and make use of structure.	In fourth grade mathematically proficient students look closely to discover a pattern or structure. For instance, students use properties of operations to explain calculations (partial products model). They relate representations of counting problems such as tree diagrams and arrays to the multiplication principal of counting. They generate number or shape patterns that follow a given rule.
8. Look for and express regularity in repeated	Students in fourth grade should notice repetitive actions in computation to make generalizations Students use models to explain calculations and understand how algorithms work. They also use models to examine patterns and generate their own algorithms. For example, students use visual fraction models to write equivalent fractions.

reasoning.	

Grade 4 Critical Areas

The Critical Areas are designed to bring focus to the standards at each grade by describing the big ideas that educators can use to build their curriculum and to guide instruction.

The Critical Areas for fourth grade can be found on page 27 in the *Common Core State Standards for Mathematics*.

1. Developing understanding and fluency with multi-digit multiplication, and developing understanding of dividing to find quotients involving multi-digit dividends.

Students generalize their understanding of place value to 1,000,000, understanding the relative sizes of numbers in each place. They apply their understanding of models for multiplication (equal-sized groups, arrays, area models), place value, and properties of operations, in particular the distributive property, as they develop, discuss, and use efficient, accurate, and generalizable methods to compute products of multi-digit whole numbers. Depending on the numbers and the context, they select and accurately apply appropriate methods to estimate or mentally calculate products. They develop fluency with efficient procedures for multiplying whole numbers; understand and explain why the procedures work based on place value and properties of operations; and use them to solve problems. Students apply their understanding of models for division, place value, properties of operations, and the relationship of division to multiplication as they develop, discuss, and use efficient, accurate, and generalizable procedures to find quotients involving multi-digit dividends. They select and accurately apply appropriate methods to estimate and mentally calculate quotients, and interpret remainders based upon the context.

2. Developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers.

Students develop understanding of fraction equivalence and operations with fractions. They recognize that two different fractions can be equal (e.g., 15/9 = 5/3), and they develop methods for generating and recognizing equivalent fractions. Students extend previous understandings about how fractions are built from unit fractions, composing fractions from unit fractions, decomposing fractions into unit fractions, and using the meaning of fractions and the meaning of multiplication to multiply a fraction by a whole number.

3. Understanding that geometric figures can be analyzed and classified based on their properties, such as having parallel sides, perpendicular sides, particular angle measures, and symmetry.

Students describe, analyze, compare, and classify two-dimensional shapes. Through building, drawing, and analyzing two-dimensional shapes, students deepen their understanding of properties of two-dimensional objects and the use of them to solve problems involving symmetry.

Operations and Algebraic Thinking

• Use the four operations with whole numbers to solve problems.

Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

Student Friendly/"I Can" statements	Resources	Assessments
1. Model multiplication facts by visually representing the equation. 2. Understand that a multiplication equation is a comparison of quantities using the product is x times as much as y (xy=product) or that the product is y times as much as x. 3. Write verbal statements of multiplicative comparisons.	http://nlvm.usu.edu Cuisennaire rods Graph paper Lined paper	

Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

Student Friendly/"I Can" statements	Resources	Assessments
1. Identify the operation of a word problem. 2. Create drawings and equations (number model) to represent a word problem. 3. Solve a multiplication or division word problem. 4. Write the solution as a comparison.	http://nlvm.usu.edu Cuisennaire rods Graph paper Lined paper	

Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Student Friendly/"I Can" statements	Resources	Assessments
1. Identify the operation of a word problem. 2. Create drawings and equations (number model) to represent a word problem. 3. Determine what the solution means including that of remainders to division problems. 4. Check reasonableness of answers by using mental computation and estimation with rounding.	http://nlvm.usu.edu Cuisennaire rods Graph paper Lined paper Ten base blocks	

• Gain familiarity with factors and multiples.

Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

Student Friendly/"I Can" statements	Resources	Assessments
1. Define factors and multiples. 2. Explain that a whole number is a multiple of each of its factors. 3. Determine that a whole number in the 1-100 range is a multiple of one digit numbers. 4. Define prime and composite.	http://nlvm.usu.edu Cuisennaire rods Graph paper Lined paper Ten base blocks	

• Generate and analyze patterns.

Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. *For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.*

Student Friendly/"I Can" statements	Resources	Assessments
1. Identify a number pattern.		
2. Identify a shape pattern.	http://nlvm.usu.edu	
3. Identify the characteristics of the pattern.	variety of number patterns	
4. Explain how the pattern continues.	variety of shape patterns	
5. Create number and shape patterns.	pattern blocks	

Number and Operations in Base Ten

• Generalize place value understanding for multi-digit whole numbers.

Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. *For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.*

Student Friendly/"I Can" statements	Resources	Assessments
1. Define multi-digit whole number. 2. Identify the factors of ten that make up the multi-digit whole number. 3. Apply concept of place value to find factors.	http://nlvm.usu.edu http://dabbleboards.com/draw mathsolutions.com http::://mathplayground http://www.shodor.org/interactive/ http://nrich.maths.org/public/ http://www.mathsisfun.com/definitions/letterp.html Ten base blocks	Study Island

Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

Student Friendly/"I Can" statements	Resources	Assessments
1. Define numerals, number names, and expanded form. 2. Identify >, =, and <. 3. Compare multi-digit numbers using <, =, and >. 4. Explain comparison based on place value.	http://nlvm.usu.edu http://dabbleboards.com/draw mathsolutions.com http::://mathplayground http://www.shodor.org/interactive/ http://nrich.maths.org/public/ http://www.mathsisfun.com/definitions/letterp.html Ten base blocks	

Use place value understanding to round multi-digit whole numbers to any place.

Student Friendly/"I Can" statements	Resources	Assessments
1. Use place value to round multi-digit whole numbers.	http://nlvm.usu.edu http://dabbleboards.com/draw mathsolutions.com http::://mathplayground http://www.shodor.org/interactive/ http://nrich.maths.org/public/ http://www.mathsisfun.com/definitions/letterp.html Ten base blocks	

• Use place value understanding and properties of operations to perform multi-digit arithmetic.

Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Student Friendly/"I Can" statements	Resources	Assessments
1. Define standard algorithm. 2. Add single digit numbers without counting (fluently). 3. Fluently subtract numbers. 4. Understand the trading (10 ones for one ten) in both addition and subtraction. 5. Add and subtract multi-digit whole numbers using the standard algorithm.	http://nlvm.usu.edu http://dabbleboards.com/draw mathsolutions.com http::://mathplayground http://www.shodor.org/interactive/ http://nrich.maths.org/public/ http://www.mathsisfun.com/definitions/letterp.html Ten base blocks	Timed tests of addition facts Timed tests of subtraction facts

Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Student Friendly/"I Can" statements	Resources	Assessments
1. Represent multiplication problems by arrays. 2. Represent multiplication problems by area models. 3. Represent multiplication problems by equations. 4. Multiply four-digit by one digit whole numbers using place value and properties of operations. 5. Multiply two-digit by two digit whole numbers using place value and properties of operations. 6. Explain products with equations, arrays and/or area models.	http://nlvm.usu.edu graph paper Cuisennaire rods	Timed tests for multiplication facts

Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Student Friendly/"I Can" statements	Resources	Assessments
1. Define quotient, remainder, dividend, and divisor. 2. Find quotients and remainders of four digit dividends and one digit divisors. 3. Use equations, arrays, and area models to explain the quotient. 4. Explain the relationship between multiplication and division.	http://nlvm.usu.edu graph paper Cuisennaire rods	

Number and Operations—Fractions

• Extend understanding of fraction equivalence and ordering.

Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

Student Friendly/"I Can" statements	Resources	Assessments
1. Understand that n/n equals one and that the multiplicative identity applies to fractions as well as whole numbers. 2. Understand that any whole number can be expressed as n/n to indicate one whole. 3. Understand that you can rename any fraction by multiplying the numerator and the denominator by one (in terms of any whole number over itself n/n). 4. Explain with a visual model how even though the number of parts when multiplied by n/n the fractions have the same value.	http://nlvm.usu.edu youtubefractions.com fraction bars graph paper plain paper to draw out fraction bars	

Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Student Friendly/"I Can" statements	Resources	Assessments
1. Use multiplicative identity in the form of n/n to create common denominators to compare fractions. 2. Use benchmark fractions to compare fractions.	http://nlvm.usu.edu youtubefractions.com fraction bars graph paper	

3. Explain the comparison of two fractions using visual models.	plain paper to draw out fraction bars	

• Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

Understand a fraction *a*/*b* with *a* > 1 as a sum of fractions 1/*b*.

a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

Student Friendly/"I Can" statements	Resources	Assessments
1. Understand that equal fractional parts of a whole make up sum of the whole. 2. Understand that the whole can be broken down to its equal fractional parts. 3. Understand that partial sums of the fractional equal parts of a whole can be combined to make the whole. 4. Understand that the whole can be broken into a variety of the fractional parts.	http://nlvm.usu.edu youtubefractions.com fraction bars graph paper plain paper to draw out fraction bars	

b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. *Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.*

Student Friendly/"I Can" statements	Resources	Assessments
1. Create sums of fractions using the same denominator and various numerators. 2. Justify the sums by using models.	http://nlvm.usu.edu youtubefractions.com fraction bars graph paper plain paper to draw out fraction bars	

c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

Student Friendly/"I Can" statements	Resources	Assessments
1. Define mixed numbers. 2. Define improper fractions. 3. Show using models how to turn mixed numbers into improper fractions and improper fractions into mixed numbers. 4. Add mixed numbers with the same denominator with the appropriate trading to express the sum as a proper mixed number. 5. Subtract mixed numbers with the same denominator by converting the whole numbers into fractions with the same denominator, make the appropriate trading to subtract the mixed numbers and express the difference as a proper mixed number.	http://nlvm.usu.edu youtubefractions.com fraction bars graph paper plain paper to draw out fraction bars	

d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

Student Friendly/"I Can" statements	Resources	Assessments
1. Solve word problems for adding and subtracting fractions by drawing out the problem. 2. Solve word problems for adding and subtracting fractions by writing the equations to represent the problem.	http://nlvm.usu.edu youtubefractions.com fraction bars graph paper plain paper to draw out fraction bars	

Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

a. Understand a fraction *a*/*b* as a multiple of 1/*b*. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*

Student Friendly/"I Can" statements	Resources	Assessments
1. Use a visual model to show that multiplying a whole number by a fraction is repeated addition of the fraction (1/b) by the number of times of the value of the whole number.	http://nlvm.usu.edu youtubefractions.com fraction bars graph paper plain paper to draw out fraction bars	

b. Understand a multiple of *a*/*b* as a multiple of 1/*b*, and use this understanding to multiply a fraction by a whole number. *For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)*

Student Friendly/"I Can" statements	Resources	Assessments
1. Use a visual model to show that multiplying a whole number (x) by a fraction a/b is repeated addition of the fraction by the number of times of the value of the whole number (xa) and can be renamed to a whole number multiplied by 1/b.	http://nlvm.usu.edu youtubefractions.com fraction bars graph paper plain paper to draw out fraction bars	

c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. *For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?*

Student Friendly/"I Can" statements	Resources	Assessments
1. Solve word problems for multiplying fractions by a whole number by drawing out the problem. 2. Solve word problems for multiplying fractions by a whole number by writing the equations to represent the problem.	http://nlvm.usu.edu youtubefractions.com fraction bars graph paper plain paper to draw out fraction bars	

• Understand decimal notation for fractions, and compare decimal fractions.

Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.4 *For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.*

Student Friendly/"I Can" statements	Resources	Assessments
1. Use place value, ten base blocks and/or 10 x 10 grid to understand that 1/10 it the same as 10/100. 2. Add fractions with 10 and 100 in the denominator and express as n/100.	http://nlvm.usu.edu 10 base blocks Place value charts Graph paper Colored pencils	

Use decimal notation for fractions with denominators 10 or 100. *For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.*

Student Friendly/"I Can" statements	Resources	Assessments
1. Write fractions with denominators of 10 and 100 as decimals. 2. Place decimals on a number line.	http://nlvm.usu.edu 10 base blocks Place value charts Graph paper Colored pencils	

Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.

Student Friendly/"I Can" statements	Resources	Assessments
1. Use area models of different areas and the same area to compare decimals to hundredths. 2. Understand that decimal comparison only applies when the area is the same. 3. Explain comparisons of <, >, and = with visual models.	http://nlvm.usu.edu 10 base blocks Place value charts Graph paper Colored pencils	

Measurement and Data

• Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.

1. Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. *For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...*

Student Friendly/"I Can" statements	Resources	Assessments
1. Convert larger units of the metric system to larger units of the metric system. 2. Record metric system conversions in a two-column table. 3. Convert larger customary units of measurement to smaller customary units of measurement. 4. Record conversions of customary measurements in a two-column table. 5. Convert larger time measurements into smaller time measurements. 6. Record time measurement conversions in a two-column table.	http://nlvm.usu.edu meter stick with inches and feet on reverse side rulers with metric and customary measurements scale with metric units and customary units analog clocks with second hands. Paper for two-column notes	

2. Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

Student Friendly/"I Can" statements	Resources	Assessments
1. Solve distance word problems for four operations that include simple fractions or decimals that require conversion from larger unit to smaller unit. 2. Represent solutions to distance word problems using a diagram with the correct scale. 3. Solve intervals of time word problems for four operations that include simple fractions or decimals that require conversion from larger unit to smaller unit. 4. Represent solutions to time word problems using a diagram with the correct scale. 5. Solve liquid volumes word problems for four operations that include simple fractions or decimals that require conversion from larger unit to smaller unit. 6. Represent solutions to liquid volumes word problems using a diagram with the correct scale. 7. Solve masses of objects word problems for four operations that include simple fractions or decimals that require conversion from larger unit to smaller unit.	http://nlvm.usu.edu meter stick with inches and feet on reverse side rulers with metric and customary measurements scale with metric units and customary units analog clocks with second hands. Paper	

8. Represent solutions to mass word problems using a diagram with the correct scale. 9. Solve money word problems for four operations that include simple fractions or decimals that require conversion from larger unit to smaller unit. 10. Represent solutions to money word problems using a diagram with the correct scale.		

3. Apply the area and perimeter formulas for rectangles in real world and mathematical problems. *For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.*

Student Friendly/"I Can" statements	Resources	Assessments
1. Determine when a rectangular real world problem or mathematical problem is the application of area or perimeter formulas. 2. Solve real world applications for area of rectangles. 3. Solve real world applications for perimeter of rectangle.	Graph paper	

• Represent and interpret data.

Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. *For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.*

Student Friendly/"I Can" statements	Resources	Assessments
1. Create line plots to display fractional data of measurements. 2. Solve problems of addition and subtraction of fractions based on the data of the line plot.	http://nlvm.usu.edu unnumbered number lines	

• Geometric measurement: understand concepts of angle and measure angles.

Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:

a. An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.

Student Friendly/"I Can" statements	Resources	Assessments
1. Define ray, endpoints, arc, and angle. 2. Understand that an angle is measured from the center of a circle as the endpoint of two rays and that the measure of the angle is the distance of the two points between where the rays intersect the diameter of the circle (arc). 3. Understand that circles are 360 degrees. 4. Understand that 1 degree angle is 1/360 of a circle.	http://nlvm.usu.edu circular protractors various size circles	

b. An angle that turns through *n* one-degree angles is said to have an angle measure of *n* degrees.

Student Friendly/"I Can" statements	Resources	Assessments
1. Understand that angles are measured in one-degree angles so that the number represented in angle measurements are the number of one degree angles.	protractors	

Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.

Student Friendly/"I Can" statements	Resources	Assessments
1. Measure angles with a protractor. 2. Create angles with a certain measure.	Protractors Unlined paper	

Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

Student Friendly/"I Can" statements	Resources	Assessments
1. Understand that half circles are 180 degrees and that the rays form a straight line so the angle measure of a straight angle is 180 degrees. 2. Understand that ¼ of a circle has an angle measurement of 90 degrees and forms a right angle. 3. Understand that 1/8 of a circle has an angle measurement of 45 degrees. 4. Understand when angles overlap their angle measures the sum of the angles can be found by decomposing the angles into non-overlapping parts. 5. Solve addition and subtraction problems that from diagrams representing real world or mathematical problems with missing angle measures. 6. Use the symbolic representation of angles and of missing angle measures in problem solutions.	Various diagrams of examples of real world application of angle measurements with unknown measures and overlapping angles.	

Geometry

• Draw and identify lines and angles, and classify shapes by properties of their lines and angles.

Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.

Student Friendly/"I Can" statements	Resources	Assessments
1. Define points, lines, line segments, rays, acute angles, obtuse angles, perpendicular lines and parallel lines. 2. Draw points, lines, line segments, rays, right, acute, and obtuse angles, perpendicular and parallel lines. 3. Know the symbolic representation of lines, line segments, rays, angles, perpendicular and parallel lines. 4. Identify points, lines, line segments, rays, right angles, acute angles, obtuse angles, perpendicular and parallel lines in two dimensional figures.	http://nlvm.usu.edu rulers plain paper Various two dimensional figures	

Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles.

Student Friendly/"I Can" statements	Resources	Assessments
1. Classify two-dimensional figures based on angle size (acute, obtuse) and parallel or perpendicular lines (right). 2. Identify triangles by angle measure. 3. Recognize that a triangle and be both acute and right.	protractors various two-dimensional figures	

Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Student Friendly/"I Can" statements	Resources	Assessments
1. Define symmetry. 2. Identify lines of symmetry. 3. Draw lines of symmetry.	various two-dimensional figures rulers	