Standards for Mathematical Practices – Grade 3

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.	In third grade, mathematically proficient students 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. Third 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 third 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.
3. Construct viable arguments and critique the reasoning of others.	In third grade, mathematically proficient students may construct arguments using concrete referents, such as objects, pictures, and drawings. 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 students experiment with representing problem situations in multiple ways including numbers, words (mathematical language), drawing pictures, using objects, acting out, 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. Third 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 third 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 to find all the possible rectangles that have a given perimeter. They compile the possibilities into an organized list or a table, and determine whether they have all the possible rectangles.
6. Attend to precision.	Mathematically proficient third 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, when figuring out the area of a rectangle they record their answers in square units.
7. Look for and make use of structure.	In third grade mathematically proficient students look closely to discover a pattern or structure. For instance, students use properties of operations as strategies to multiply and divide (commutative and distributive properties).
8. Look for and express regularity in	Mathematically proficient students in third grade should notice repetitive actions in computation and look for more shortcut methods. For example, students may use the distributive property

repeated reasoning.	as a strategy for using products they know to solve products that they don't know. For example, if students are asked to find the product of 7 x 8, they might decompose 7 into 5 and 2 and then multiply 5 x 8 and 2 x 8 to arrive at 40 + 16 or 56. In addition, third graders continually evaluate their work by asking themselves, "Does this make sense?"

Grade 3 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 third grade can be found on page 21 in the *Common Core State Standards for Mathematics*.

1. Developing understanding of multiplication and division and strategies for multiplication and division within 100.

Students develop an understanding of the meanings of multiplication and division of whole numbers through activities and problems
involving equal-sized groups, arrays, and area models; multiplication is finding an unknown product, and division is finding an unknown
factor in these situations. For equal-sized group situations, division can require finding the unknown number of groups or the unknown
group size. Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution
strategies, students learn the relationship between multiplication and division.

2. Developing understanding of fractions, especially unit fractions (fractions with numerator 1).

Students develop an understanding of fractions, beginning with unit fractions. Students view fractions in general as being built out of unit
fractions, and they use fractions along with visual fraction models to represent parts of a whole. Students understand that the size of a
fractional part is relative to the size of the whole. For example, 1/2 of the paint in a small bucket could be less paint than 1/3 of the paint
in a larger bucket, but 1/3 of a ribbon is longer than 1/5 of the same ribbon because when the ribbon is divided into 3 equal parts, the parts
are longer than when the ribbon is divided into 5 equal parts. Students are able to use fractions to represent numbers equal to, less than,
and greater than one. They solve problems that involve comparing fractions by using visual fraction models and strategies based on
noticing equal numerators or denominators.

3. Developing understanding of the structure of rectangular arrays and of area.

Students recognize area as an attribute of two-dimensional regions. They measure the area of a shape by finding the total number of same size units of area required to cover the shape without gaps or overlaps, a square with sides of unit length being the standard unit for
measuring area. Students understand that rectangular arrays can be decomposed into identical rows or into identical columns. By
decomposing rectangles into rectangular arrays of squares, students connect area to multiplication, and justify using multiplication to
determine the area of a rectangle.

4. Describing and analyzing two-dimensional shapes.

Students describe, analyze, and compare properties of two-dimensional shapes. They compare and classify shapes by their sides and

angles, and connect these with definitions of shapes. Students also relate their fraction work to geometry by expressing the area of part of
a shape as a unit fraction of the whole.

Operations and Algebraic Thinking

• Represent and solve problems involving multiplication and division.

Interpret products of whole numbers, e.g., interpret 5 × 7 as the total number of objects in 5 groups of 7 o
describe a context in which a total number of objects can be expressed as 5 × 7.

Student Friendly/"I Can" statements	Resources	A
1. Define product. 2. Construct multiplication problems using manipulatives. 3. Identify the difference between 3 x 2 and 2 x 3 to define Commutative property. 4. Create sentences or phrases that demonstrate understanding of products of whole numbers that identify with real world connections.	http://nlvm.usu.edu Cuisennaire rods Ten Base Blocks Graph paper for drawing out arrays Sets of items such as paper clips, erasers, beans, etc. Blank paper to create visual dictionary.	Performa Create a multi det Ongoing visu

Interpret whole-number quotients of whole numbers, e.g., interpret 56 ÷ 8 as the number of objects in eac
are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal s
For example, describe a context in which a number of shares or a number of groups can be expressed as 56

Student Friendly/"I Can" statements	Resources	A
1. Define quotient. 2. Perform the operation of division on whole numbers to determine quotient. 3. Demonstrate an understanding of whole numbers being partitioned into equal parts to determine quotient.	http://nlvm.usu.edu Cuisennaire rods Ten Base Blocks Graph paper for drawing out arrays Sets of items such as paper clips, erasers, beans, etc. Blank paper for visual dictionary	Performa Create a divisio Ongoing visu

Use multiplication and division within 100 to solve word problems in situations involving equal groups, arra
quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the

Student Friendly/"I Can" statements	Resources	A
1. Identify signal words for operations in word problems. 2. Break apart word problem by drawing out each sentence. 3. Perform correct operations to solve word problems.	http://nlvm.usu.edu Cuisennaire rods Ten Base Blocks Graph paper for drawing out arrays Sets of items such as paper clips, erasers, beans, etc. Blank paper for signal word list and drawing out problems.	Standardized t

Determine the unknown whole number in a multiplication or division equation relating three whole numb
determine the unknown number that makes the equation true in each of the equations 8 × ? = 48, 5 = □ ÷ 3

Student Friendly/"I Can" statements	Resources	A
1. Demonstrate knowledge of multiplication facts and understand that division is the inverse operation. 2. Identify the missing number in multiplication and division problems.	http://nlvm.usu.edu Cuisennaire rods Ten Base Blocks Graph paper for drawing out arrays Sets of items such as paper clips, erasers, beans, etc.	

• Understand properties of multiplication and the relationship between multiplication an

Apply properties of operations as strategies to multiply and divide. *Examples: If 6 × 4 = 24 is known, then 4*
(Commutative property of multiplication.) 3 × 5 × 2 can be found by 3 × 5 = 15, then 15 × 2 = 30, or by 5 × 2
(Associative property of multiplication.) Knowing that 8 × 5 = 40 and 8 × 2 = 16, one can find 8 × 7 as 8 × (5
+ 16 = 56. (Distributive property.)

Student Friendly/"I Can" statements	Resources	A
1. Define, understand, and apply Commutative property of multiplication. 2. Define, understand, and apply Associative property of multiplication. 3. Define, understand, and apply Distributive property of multiplication.	http://nlvm.usu.edu Cuisennaire rods Ten Base Blocks Graph paper for drawing out arrays Sets of items such as paper clips, erasers, beans, etc.	

Understand division as an unknown-factor problem. *For example, find 32 ÷ 8 by finding the number that m*
by 8.

Student Friendly/"I Can" statements	Resources	A
1. Demonstrate knowledge of multiplication facts and understand that division is the inverse operation. 2. Identify the missing number in multiplication and division problems.	http://nlvm.usu.edu Cuisennaire rods Ten Base Blocks Graph paper for drawing out arrays Sets of items such as paper clips, erasers, beans, etc.	

• Multiply and divide within 100.

Fluently multiply and divide within 100, using strategies such as the relationship between multiplication an
that 8 × 5 = 40, one knows 40 ÷ 5 = 8) or properties of operations. By the end of Grade 3, know from memo
one-digit numbers.

Student Friendly/"I Can" statements	Resources	A
1. Multiply and divide 40 problems in one minute.	http://nlvm.usu.edu	One or two minu divis

• Solve problems involving the four operations, and identify and explain patterns in arith

Solve two-step word problems using the four operations. Represent these problems using equations with a unknown quantity. Assess the reasonableness of answers using mental computation and estimation strate

Student Friendly/"I Can" statements	Resources	A
1. Write equations as a plan to solve word problems. 2. Know that letters are variables that stand for numbers. 3. Solve equation with appropriate operations. 4. Check reasonable of answer by estimating, mentally computing, and/or rounding.	http://nlvm.usu.edu	Develop a proble step word prob solut

Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain th operations. *For example, observe that 4 times a number is always even, and explain why 4 times a number two equal addends.*

Student Friendly/"I Can" statements	Resources	A
1. Identify patterns in tables. 2. Explain the pattern using the rule with the properties of operations.	Addition tables Multiplication tables Input/output tables	

Number and Operations in Base Ten

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

Use place value understanding to round whole numbers to the nearest 10 or 100.

Student Friendly/"I Can" statements	Resources	A
1. Understand that ten ones equal ten and ten tens equal one hundred, etc. 2. Understand the position of numbers is important to naming the value of the number.	http://nlvm.usu.edu Cuisennaire rods Ten Base Blocks Sets of items such as paper clips, erasers, beans, etc.	

Fluently add and subtract within 1000 using strategies and algorithms based on place value, properties of o relationship between addition and subtraction.

Student Friendly/"I Can" statements	Resources	A
1. Add and subtract 40 problems in one minute for demonstrating fluency. 2. Demonstrate which addends equal 10, 100, and 1000. 3. Know that addition and subtraction are inverse operations.	http://nlvm.usu.edu Cuisennaire rods Ten Base Blocks Sets of items such as paper clips, erasers, beans, etc.	Addition and

Multiply one-digit whole numbers by multiples of 10 in the range 10–90 (e.g., 9 × 80, 5 × 60) using strategie and properties of operations.

Student Friendly/"I Can" statements	Resources	A
1. Multiply one-digit whole numbers by multiples of 10.		

Number and Operations—Fractions

• Develop understanding of fractions as numbers.

Understand a fraction 1/*b* as the quantity formed by 1 part when a whole is partitioned into *b* equal parts; as the quantity formed by *a* parts of size 1/*b*.

Student Friendly/"I Can" statements	Resources	A
1. Divide a whole into equal and even parts. 2. Name the parts of the whole by counting the number of the equal pieces that make up the whole and identifying it as 1/ (number of equal parts).	http://nlvm.usu.edu fraction bars graph paper	

Understand a fraction as a number on the number line; represent fractions on a number line diagram.

a. Represent a fraction 1/*b* on a number line diagram by defining the interval from 0 to 1 as the whole and equal parts. Recognize that each part has size 1/*b* and that the endpoint of the part based at 0 locates the number line. b. Represent a fraction *a*/*b* on a number line diagram by marking off *a* lengths 1/*b* from 0. Re interval has size *a*/*b* and that its endpoint locates the number *a*/*b* on the number line.

Student Friendly/"I Can" statements	Resources	A
1. Place simple fractions on a number line. 2. Know that the denominator represents the number of lines from 0 to 1 on the number line.	http://nlvm.usu.edu fraction bars graph paper clothes line or similar rope clothes pins number lines	

Explain equivalence of fractions in special cases, and compare fractions by reasoning about their size.

a. Understand two fractions as equivalent (equal) if they are the same size, or the same point on a number

Student Friendly/"I Can" statements	Resources	A
1. Identify when two fractions are equivalent because they are the same size. 2. Identify when two fractions are equivalent because they are the same point on the number line.	http://nlvm.usu.edu fraction bars graph paper clothes line or similar rope clothes pins number lines	

b. Recognize and generate simple equivalent fractions, e.g., 1/2 = 2/4, 4/6 = 2/3). Explain why the fractions using a visual fraction model.

Student Friendly/"I Can" statements	Resources	A
1. Create equivalent fractions with different denominators. 2. Explain why two fractions are equivalent.	http://nlvm.usu.edu fraction bars graph paper clothes line or similar rope clothes pins number lines	

c. Express whole numbers as fractions, and recognize fractions that are equivalent to whole numbers. *Exar form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram.*

Student Friendly/"I Can" statements	Resources	A
1. Know that a whole number can be represented by the number over one. 2. Know that a whole number over itself represents one.	http://nlvm.usu.edu fraction bars graph paper clothes line or similar rope clothes pins number lines plain paper to draw out wholes	

d. Compare two fractions with the same numerator or the same denominator by reasoning about their size comparisons are valid only when the two fractions refer to the same whole. Record the results of comparis or <, and justify the conclusions, e.g., by using a visual fraction model.

Student Friendly/"I Can" statements	Resources	A
1. Compare two fractions with the same denominator and explain which is larger/smaller. 2. Compare two fractions with the same numerators and explain which is larger/smaller. 3. Explain which comparisons were easier to do by using visual models.	http://nlvm.usu.edu fraction bars graph paper clothes line or similar rope clothes pins number lines plain paper	Fraction book pro

Measurement and Data

• Solve problems involving measurement and estimation of intervals of time, liquid volum objects.

Tell and write time to the nearest minute and measure time intervals in minutes. Solve word problems inv subtraction of time intervals in minutes, e.g., by representing the problem on a number line diagram.

Student Friendly/"I Can" statements	Resources	A
1. Tell time to the nearest minute. 2. Add and subtract time intervals in minutes. 3. Solve time word problems. 4. Graph time intervals on a number line (x-axis).	http://nlvm.usu.edu analog clock number lines graph paper	

Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (k subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in using drawings (such as a beaker with a measurement scale) to represent the problem.

Student Friendly/"I Can" statements	Resources	A
1. Measure liquids to the nearest liter. 2. Measure mass to the nearest gram and kilogram. 3. Estimate liquids to the nearest liter. 4. Estimate mass to the nearest gram or kilogram. 5. Add and subtract same measure word problems involving liquids and mass using models or drawings. 6. Multiply and divide same measure word problems involving mass and liquids using models or drawings.	Scales Grams and kilogram weights Liter bottles Paper for drawing out problems	

• Represent and interpret data.

Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve o
many more" and "how many less" problems using information presented in scaled bar graphs. *For exampl*
which each square in the bar graph might represent 5 pets

Student Friendly/"I Can" statements	Resources	A
1. Create a picture graph for data collected that represents several categories with scales that represent more than one unit. 2. Create a bar graph for data collected that represents several categories with scales that represent more than one unit. 3. Analyze and interpret graphs to solve one- and two-step problems.	http://nlvm.usu.edu graph paper pictures for pictographs Excel spreadsheet Colored pencils	

Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch.
a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quar

Student Friendly/"I Can" statements	Resources	A
1. Use rulers to measure objects to the nearest half and quarter of an inch. 2. Graph measurement data on a line plot with appropriate measures.	Number lines Rulers Various objects	

• Geometric measurement: understand concepts of area and relate area to multiplication

Recognize area as an attribute of plane figures and understand concepts of area measurement.

a. A square with side length 1 unit, called "a unit square," is said to have "one square unit" of area, and ca
area.

Student Friendly/"I Can" statements	Resources	A
1. Recognize one square unit of area as a 1 x 1 array.	http://nlvm.usu.edu squares of various sizes graph paper	

b. A plane figure which can be covered without gaps or overlaps by *n* unit squares is said to have an area o

Student Friendly/"I Can" statements	Resources	A
1. Measure and calculate area based on one square unit. 2. Draw various areas by using arrays.	http://nlvm.usu.edu squares of various sizes graph paper	

Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).

Student Friendly/"I Can" statements	Resources	A
1. Label areas with the appropriate label.	http://nlvm.usu.edu squares of various sizes graph paper	

Relate area to the operations of multiplication and addition.

a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the sa multiplying the side lengths.

Student Friendly/"I Can" statements	Resources	A
1. Find areas using models.	http://nlvm.usu.edu tiles or centimeter blocks graph paper	

b. Multiply side lengths to find areas of rectangles with whole number side lengths in the context of solvin mathematical problems, and represent whole-number products as rectangular areas in mathematical reas

Student Friendly/"I Can" statements	Resources	A
1. Solve real world problems of area by using arrays, multiplication, and models. 2. Understand that areas of rectangles can be solved with multiplying the side lengths.	http://nlvm.usu.edu tiles or centimeter blocks graph paper	

c. Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths *a* and
and *a* × *c*. Use area models to represent the distributive property in mathematical reasoning.

Student Friendly/"I Can" statements	Resources	A
1. Use models to show how to use the distributive property to find the area of a rectangle.	http://nlvm.usu.edu tiles or centimeter blocks graph paper	

d. Recognize area as additive. Find areas of rectilinear figures by decomposing them into non-overlapping
areas of the non-overlapping parts, applying this technique to solve real world problems.

Student Friendly/"I Can" statements	Resources	A
1. Find areas of multiple rectangular figures by separating the rectangles and add the areas of the individual rectangles to get the area of the entire figure.	http://nlvm.usu.edu tiles or centimeter blocks graph paper	

• Geometric measurement: recognize perimeter as an attribute of plane figures and distin
and area measures.

Solve real world and mathematical problems involving perimeter of polygons, including finding the perime
finding an unknown side length, and exhibiting rectangles with the same perimeter and different areas or
different perimeters.

Student Friendly/"I Can" statements	Resources	A
1. Find the perimeter of a rectangle by deconstructing the rectangle into a continuous line to understand that a perimeter is linear. 2. Understand that a perimeter of a rectangle is found by adding all the side lengths of a rectangle. 3. Find a missing length of a rectangle if given one side length and the area of the rectangle. 4. Find rectangles with the same area and different perimeters. 5. Find rectangles with different areas and the same perimeter.	http://nlvm.usu.edu tiles or centimeter blocks graph paper number lines rectangles of different sizes	

Geometry

• Reason with shapes and their attributes.

Understand that shapes in different categories *(e.g., rhombuses, rectangles, and others)* may share attribu
sides), and that the shared attributes can define a larger category *(e.g., quadrilaterals). Recognize rhombus*
squares as examples of quadrilaterals, and draw examples of quadrilaterals that do not belong to any of th

Student Friendly/"I Can" statements	Resources	A
1. Understand the nomenclature of quadrilaterals refer to the number of sides. 2. Understand that specific shapes belong to the larger category of quadrilaterals.	http://nlvm.usu.edu graph paper quadrilaterals rectangles squares trapezoids rhombuses graphic organizer (double bubble or Venn diagram) to explain similarities and differences of various shapes	

Partition shapes into parts with equal areas. Express the area of each part as a unit fraction of the whole. *F*
shape into 4 parts with equal area, and describe the area of each part as 1/4 of the area of the shape.

Student Friendly/"I Can" statements	Resources	A
1. Partition shapes into equal parts. 2. Name the parts of a shape as the number of parts over the total number of equal parts that make up the shape.	http://nlvm.usu.edu pattern blocks graph paper dot paper	