

3rd Grade OAS/PASS Companion Guide

Purpose of the Companion Guide

This companion guide was created during the 2014 convening by educators from Mid-Del, Broken Arrow, Sallisaw, Glenpool, Ada, and Oklahoma City. The convening was an effort to bring educators from across the state together to create resources they thought would be useful for teachers in the coming year. This companion guide was created to provide teachers with:

- Clarification on grade level content standards
- A broad pacing schedule based on the blueprints for testing
- Vertical alignment for the grade levels above and below
- Resources specific to grade level content standards

Table of Contents

One-Page 3rd Grade PASS standards

Process Standards

These process standards are the same for Grades K-5 and give students a consistent definition of mathematics to help foster a positive attitude toward their own mathematical abilities. The process standards are a list of skills needed to perform math in any area and promote active involvement, deeper understanding, and conceptual understanding as opposed to content standards that focus on individual topics that need to be learned at a grade level.

- One-Page Process Standards
- Planning and Delivery

Major Concept Vertical Alignment and Pacing Guide

These tools were created during the convening of educators in the summer 2014 to give teachers a broad overview and idea of a timeline. Teachers are encouraged to tweak the timeline to fit the curriculum they are using in their classrooms.

Major Concepts and “I can” statements with Sample Math Tasks

The major concepts are defined in PASS at the beginning of each grade level. The educators at the convening blended them and the highest ranked concepts on the testing blueprints to determine the most important concepts in each grade level as a focus for this document. They took each statement and hunted sample math tasks or lessons to be used as a possible starting point for teachers. There will be/is a page dedicated on okmathteachers.com that will be a running list of these resources and others people will/have added as the year continues. We have tagged these with both PASS and CCSS codes in an effort to help teachers be able to use the millions of shared resources. Teachers need to use their discretion in implementing strategies and activities.

Resources

Comprehensive Reviewed Lesson Banks (Links on OKMathTeachers.com page)
Oklahoma Teachers’ Collection (Links on OKMathTeachers.com page)

How/Where to send Feedback

OSDE Emails/phones
Google Survey?

3rd Grade Math | Priority Academic Student Skills

Standard 1: Algebraic Reasoning: Patterns and Relationships - - The student will use a variety of problem-solving approaches to extend and create patterns.

- 3.1.1** Describe (orally or in written form), create, extend and predict patterns in a variety of situations (e.g., 3, 6, 9, 12 . . . , use a function machine to generate input and output values for a table, show multiplication patterns on a hundreds chart, determine a rule and generate additional pairs with the same relationship).
- 3.1.2** Find unknowns in simple arithmetic problems by solving open sentences (equations) and other problems involving addition, subtraction, and multiplication.
- 3.1.3** Recognize and apply the commutative and identity properties of multiplication using models and manipulative to develop computational skills (e.g., $3 \cdot 5 = 5 \cdot 3$, $7 \cdot 1 = 7$)

Standard 2: Number Sense and Operation The student will use numbers and number relationships to acquire basic facts. The student will estimate and compute with whole numbers.

- 3.2.1** **Number Sense**
 - 3.2.1a** *Place Value*
 - 3.2.1ai** Model the concept of place value through 4 digits (e.g., base-10 blocks, bundles of 10s, place value mats).
 - 3.2.1aii** Read and write whole numbers up to 4 digits (e.g., expanded form, standard form).
 - 3.2.1b** *Whole Numbers and Fractions*
 - 3.2.1bi** Compare and order whole numbers up to 4 digits.
 - 3.2.1bii** Create and compare physical and pictorial models of equivalent and nonequivalent fractions including halves, thirds, fourths, eighths, tenths, twelfths, and common percents (25%, 50%, 75%, 100%) (e.g., fraction circles, pictures, egg cartons, fraction strips, number lines).
- 3.2.2** **Number Operations**
 - 3.2.2a** Estimate and find the sum or difference (with and without regrouping) of 3- and 4-digit numbers using a variety of strategies to solve application problems
 - 3.2.2b** *Multiplication Concepts and Fact Families*
 - 3.2.2bi** Use physical models and a variety of multiplication algorithms to find the product of multiplication problems with one-digit multipliers.
 - 3.2.2bii** Demonstrate fluency (memorize and apply) with basic multiplication facts up to 10×10 and the associated division facts (e.g., $5 \times 6 = 30$ and $30 \div 6 = 5$)

3.2.2biii Estimate the product of 2-digit by 2-digit numbers by rounding to the nearest multiple of 10 to solve application problems.

Standard 3: Geometry - The student will use geometric properties and relationships to recognize and describe shapes.

- 3.3.1** Identify and compare attributes of two- and three- dimensional shapes and develop vocabulary to describe the attributes (e.g., count the edges and faces of a cube, the radius is half of a circle, lines of symmetry)
- 3.3.2** Analyze the effects of combining and subdividing two- and three-dimensional figures (e.g., folding paper, tiling, nets, and rearranging pieces of solids)
- 3.3.3** Make and use coordinate systems to specify locations and shapes on a grid with ordered pairs and to describe paths from one point to another point on a grid.

Standard 4: Measurement - The student will use appropriate units of measure to solve problems.

- 3.4.1** *Measurement*
 - 3.4.1a** Choose an appropriate measurement instrument and measure the length of objects to the nearest inch or half-inch and the weight of objects to the nearest pound or ounce.
 - 3.4.1b*** Choose an appropriate measurement instrument and measure the length of objects to the nearest meter or centimeter and the weight of objects to the nearest gram or kilogram.
 - 3.4.1c** Develop and use the concept of perimeter of different shapes to solve problems.
 - 3.4.1d*** Develop and use strategies to choose an appropriate unit and measurement instrument to estimate measurements (e.g., use parts of the body as benchmarks for measuring length)
- 3.4.2** *Time and Temperature*
 - 3.4.2a** Solve simple addition problems with time (e.g., 15 minutes added to 1:10)
 - 3.4.2b** Tell time on a digital and analog clock to the nearest 5 minute
 - 3.4.2c** Read a thermometer and solve for temperature change.
- 3.4.3** *Money:* Determine the correct amount of change when a purchase is made with a five dollar bill.

Standard 5: Data Analysis - The student will demonstrate an understanding of collection, display, and interpretation of data and probability.

- 3.5.1** *Data Analysis*
 - 3.5.1a*** Pose questions, collect, record, and interpret data to help answer questions (e.g., which was the most popular booth at our carnival?).
 - 3.5.1b** Read graphs and charts, identify the main idea, draw conclusions, and make predictions based on the data (e.g., predict how many children will bring their lunch based on a menu).
 - 3.5.1c** Construct bar graphs, frequency tables, line graphs (plots), and pictographs with labels and a title from a set of data.
- 3.5.2** *Probability:* Describe the probability (more, less, or equally likely) of chance events.

Elementary Math | Process Skills

Process Standard 1: Problems Solving

- 1.1 Use problem-solving approaches (e.g., act out situations, represent problems with drawings and lists, use concrete, pictorial, graphical, oral, written, and/or algebraic models, understand a problem, devise a plan, carry out the plan, look back).
- 1.2 Formulate problems from every day and mathematical situations (e.g., how many forks are needed?, how many students are absent?, how can we share/divide these cookies?, how many different ways can we find to compare these fractions?).
- 1.3 Develop, test, and apply strategies to solve a variety of routine and non-routine problems (e.g., look for patterns, make a table, make a problem simpler, process of elimination, trial and error).
- 1.4 Verify and interpret results with respect to the original problem (e.g., students explain verbally why an answer makes sense, explain in a written format why an answer makes sense, verify the validity of each step taken to obtain a final result).
- 1.5 Distinguish between necessary and irrelevant information in solving problems (e.g., play games and discuss “best” clues, write riddles with sufficient information, identify unnecessary information in written story problems).

Process Standard 2: Communication

- 2.1 Express mathematical ideas coherently and clearly to peers, teachers, and others (e.g., with verbal ideas, models or manipulatives, pictures, or symbols).
- 2.2 Extend mathematical knowledge by considering the thinking and strategies of others (e.g., agree or disagree, rephrase another student’s explanation, analyze another student’s explanation).
- 2.3 Relate manipulatives, pictures, diagrams, and symbols to mathematical ideas.
- 2.4 Represent, discuss, write, and read mathematical ideas and concepts. Start by relating everyday language to mathematical language and symbols and progress toward the use of appropriate terminology (e.g., “add more” becomes “plus”, “repeated addition” becomes “multiplication”, “fair share” becomes “divide”, “balance the equation” becomes “solve the equation”).

Process Standard 3: Reasoning

- 3.1 Explain mathematical situations using patterns and relationships (e.g., identify patterns in situations, represent patterns in a variety of ways, and extend patterns to connect with more general cases).
- 3.2 Demonstrate thinking processes using a variety of age-appropriate materials and reasoning processes (e.g., manipulatives, models, known facts, properties and relationships, inductive [specific to general], deductive [general to specific], spatial, proportional, logical reasoning [“and” “or” “not”] and recursive reasoning).
- 3.3 Make predictions and draw conclusions about mathematical ideas and concepts. Predictions become conjectures and conclusions become more logical as students mature mathematically.

Process Standard 4: Connections

- 4.1 Relate various concrete and pictorial models of concepts and procedures to one another (e.g., use two colors of cubes to represent addition facts for the number 5, relate patterns on a hundreds chart to multiples, use base-10 blocks to represent decimals).
- 4.2 Link concepts to procedures and eventually to symbolic notation (e.g., represent actions like snap, clap, clap with symbols A B B, demonstrate 3 4 with a geometric array, divide a candy bar into 3 equal pieces that represent one piece as $\frac{1}{3}$).
- 4.3 Recognize relationships among different topics within mathematics (e.g., the length of an object can be represented by a number, multiplication facts can be modeled with geometric arrays, can be written as .5 and 50%).
- 4.4 Use mathematical strategies to solve problems that relate to other curriculum areas and the real world (e.g., use a timeline to sequence events, use symmetry in art work, explore fractions in quilt designs and to describe pizza slices).

Process Standard 5: Representation

- 5.1 Create and use a variety of representations appropriately and with flexibility to organize, record, and communicate mathematical ideas (e.g., dramatizations, manipulatives, drawings, diagrams, tables, graphs, symbolic representations).
- 5.2 Use representations to model and interpret physical, social, and mathematical situations (e.g., counters, pictures, tally marks, number sentences, geometric models; translate between diagrams, tables, charts, graphs).

Math Process Standard 1: Problem Solving

Sub-Standards	Questions to Develop Mathematical Thinking
<p>1. Use problem-solving approaches (e.g., act out situations, represent problems with drawings and lists, use concrete, pictorial, graphical, oral, written, and/or algebraic models, understand a problem, devise a plan, carry out the plan, look back). CCSS.MATH.PRACTICE.MP1 <i>Make sense of problems and persevere in solving them.</i></p> <p>2. Formulate problems from everyday and mathematical situations (e.g., how many forks are needed?, how many students are absent?, how can we share/divide these cookies?, how many different ways can we find to compare these fractions?). CCSS.MATH.PRACTICE.MP1 <i>Make sense of problems and persevere in solving them.</i></p> <p>3. Develop, test, and apply strategies to solve a variety of routine and non-routine problems (e.g., look for patterns, make a table, make a problem simpler, process of elimination, trial and error). CCSS.MATH.PRACTICE.MP1 <i>Make sense of problems and persevere in solving them.</i></p> <p>4. Verify and interpret results with respect to the original problem (e.g., students explain verbally why an answer makes sense, explain in a written format why an answer makes sense, verify the validity of each step taken to obtain a final result). CCSS.MATH.PRACTICE.MP6 <i>Attend to precision.</i></p> <p>5. Distinguish between necessary and irrelevant information in solving problems (e.g., play games and discuss “best” clues, write riddles with sufficient information, identify unnecessary information in written story problems). CCSS.MATH.PRACTICE.MP2 <i>Reason abstractly and quantitatively.</i></p>	<ul style="list-style-type: none"> ○ How would you describe the problem in your own words? ○ How would you describe what you are trying to find? ○ What information is given in the problem? ○ Describe what you have already tried. What might you change? ○ Talk me through the steps you’ve used to this point. ○ What steps in the process are you most confident about? ○ What are some other strategies you might try? ○ How might you use one of your previous problems to help you begin? ○ How would you organize...represent...show...? ○ Interpret and make meaning of the problem looking for starting points. ○ Plan a solution instead of jumping to a solution. ○ Monitor the progress and change the approach if necessary. ○ Relate current situations to concepts or skills previously learned and connect mathematical ideas to one another. ○ Students ask themselves, “Does this make sense?” and understand various approaches to solutions.
What does it look like in planning and delivery?	
<p>Tasks: elements to keep in mind when determining learning experiences</p> <ul style="list-style-type: none"> ○ Requires students to engage with conceptual ideas that underlie the procedures to complete the task and develop understanding. ○ Allows for multiple entry points and solution paths as well as, multiple representations, such as visual diagrams, manipulatives, symbols, and problem situations. ○ Requires students to defend and justify their solutions. 	<p>Teacher: actions that further promote mathematical thinking</p> <ul style="list-style-type: none"> ○ Allows students time to initiate a plan; uses question prompts as needed to assist students in developing a pathway. ○ Continually asks students if their plans and solutions make sense. ○ Questions students to see connections to previous solution attempts and/or tasks to make sense of current problem. ○ Consistently asks to defend and justify their solution by comparing solution paths. ○ Differentiates to keep advanced students challenged during work time

Math Practice references included to make it easier for teachers to find resources on the internet pertaining to the teaching and learning of good math practice. Format and some content adapted from LouisianaBelieves.com.

Math Process Standard 2: Communication

Sub-Standards	Questions to Develop Mathematical Thinking
<p>1. Express mathematical ideas coherently and clearly to peers, teachers, and others (e.g., with verbal ideas, models or manipulatives, pictures, or symbols). CCSS.MATH.PRACTICE.MP3 Construct viable arguments and critique the reasoning of others.</p> <p>2. Extend mathematical knowledge by considering the thinking and strategies of others (e.g., agree or disagree, rephrase another student’s explanation, analyze another student’s explanation). CCSS.MATH.PRACTICE.MP3 Construct viable arguments and critique the reasoning of others.</p> <p>3. Relate manipulatives, pictures, diagrams, and symbols to mathematical ideas. CCSS.MATH.PRACTICE.MP2 Reason abstractly and quantitatively.</p> <p>4. Represent, discuss, write, and read mathematical ideas and concepts. Start by relating everyday language to mathematical language and symbols and progress toward the use of appropriate terminology (e.g., “add more” becomes “plus”, “repeated addition” becomes “multiplication”, “fair share” becomes “divide”, “balance the equation” becomes “solve the equation”). CCSS.MATH.PRACTICE.MP4 Model with mathematics.</p>	<ul style="list-style-type: none"> ○ Ask themselves “How can I represent this mathematically?” ○ What mathematical evidence supports your solution? ○ How can you be sure that...? / How could you prove that...? Will it still work if...? ○ What were you considering when...? ○ How did you decide to try that strategy? ○ Would it help to create a diagram, graph, table, ...? ○ What are some ways to visually represent...?
What does it look like in planning and delivery?	
<p>Tasks: elements to keep in mind when determining learning experiences</p> <ul style="list-style-type: none"> ○ Apply general mathematical rules to specific situations. ○ Create mathematical ideas using models, manipulatives, pictures, or symbols to express mastery. ○ Determine patterns and structures. ○ Create a logical representation of the problem. ○ Justify their conclusions, explain them to others and respond to the arguments of others. ○ Listen to the arguments of others and ask useful questions to determine if an argument makes sense. 	<p>Teacher: actions that further promote mathematical thinking</p> <ul style="list-style-type: none"> ○ Ask clarifying questions or suggest ideas to improve/revise the argument. ○ Create a logical representation of the problem. ○ Able to decontextualize (represent a situation symbolically and manipulate the symbols) and contextualize (make meaning of the symbols in a problem) quantitative relationships. ○ Apply the math students know to solve problems in everyday life.

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Math Process Standard 3: Reasoning

Sub-Standards	Questions to Develop Mathematical Thinking
<p>1. Explain mathematical situations using patterns and relationships (e.g., identify patterns in situations, represent patterns in a variety of ways, extend patterns to connect with more general cases). CCSS.MATH.PRACTICE.MP7 Look for and make use of structure.</p> <p>2. Demonstrate thinking processes using a variety of age-appropriate materials and reasoning processes (e.g., manipulatives, models, known facts, properties and relationships, inductive [specific to general], deductive [general to specific], spatial, proportional, logical reasoning [“and” “or” “not”] and recursive reasoning). CCSS.MATH.PRACTICE.MP2 Reason abstractly and quantitatively.</p> <p>3. Make predictions and draw conclusions about mathematical ideas and concepts. Predictions become conjectures and conclusions become more logical as students mature mathematically. CCSS.MATH.PRACTICE.MP2 Reason abstractly and quantitatively.</p>	<ul style="list-style-type: none"> ○ How did you decide in this task that you needed to use...? Could you have used another operation or property to solve this task? Why or why not? ○ What observations do you make about...? ○ What do you notice when...? ○ What parts of the problem might you eliminate or simplify? ○ What patterns do you find in...? ○ How do you know if something is a pattern?
What does it look like in planning and delivery?	
<p>Tasks: elements to keep in mind when determining learning experiences</p> <ul style="list-style-type: none"> ○ Requires students to look for the structure within mathematics in order to solve the problem. (i.e. – decomposing numbers by place value, working with properties, etc.). ○ Expects students to look at problems and think about them in an unconventional way that demonstrates a deeper understanding of the mathematical structure— leading to a more efficient way of solving the problem. 	<p>Teacher: actions that further promote mathematical thinking</p> <ul style="list-style-type: none"> ○ Encourages students to look at or something they recognize and have students apply the information in identifying solution paths. ○ Expects students to explain the overall structure of the problem and the big math idea used to solve the problem.

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Math Process Standard 4: Connections

Sub-Standards	Questions to Develop Mathematical Thinking
<p>1. Relate various concrete and pictorial models of concepts and procedures to one another (e.g., use two colors of cubes to represent addition facts for the number 5, relate patterns on a hundreds chart to multiples, use base-10 blocks to represent decimals). CCSS.MATH.PRACTICE.MP7 Look for and make use of structure.</p> <p>2. Link concepts to procedures and eventually to symbolic notation (e.g., represent actions like snap, clap, clap with symbols A B B, demonstrate 3 4 with a geometric array, divide a candy bar into 3 equal pieces that represent one piece as 1/3). CCSS.MATH.PRACTICE.MP8 Look for and express regularity in repeated reasoning.</p> <p>3. Recognize relationships among different topics within mathematics (e.g., the length of an object can be represented by a number, multiplication facts can be modeled with geometric arrays, can be written as .5 and 50%). CCSS.MATH.PRACTICE.MP7 Look for and make use of structure.</p> <p>4. Use mathematical strategies to solve problems that relate to other curriculum areas and the real world (e.g., use a timeline to sequence events, use symmetry in art work, explore fractions in quilt designs and to describe pizza slices). CCSS.MATH.PRACTICE.MP4 Model with mathematics.</p>	<ul style="list-style-type: none"> ○ What number model could you construct to represent the problem? ○ What are some ways to represent the quantities? ○ What's an equation or expression that matches the diagram? number line? chart? table? ○ Would it help to create a diagram, graph, table, ...? ○ What are some ways to visually represent...? ○ What patterns do you find in...? ○ How do you know if something is a pattern? ○ How does this relate to...? ○ In what ways does this problem connect to other concepts? ○ Will the same strategy work in other situations?
What does it look like in planning and delivery?	
Tasks: elements to keep in mind when determining learning experiences	Teacher: actions that further promote mathematical thinking
<ul style="list-style-type: none"> ○ Is structured so that students represent the problem situation and their solution symbolically, graphically, and/or pictorially (may include technological tools) appropriate to the context of the problem. ○ Invites students to create a context (real-world situation) that explains numerical/symbolic representations. ○ Asks students to take complex mathematics and make it simpler by creating a model that will represent the relationship between the quantities. ○ Requires students to look for the structure within mathematics in order to solve the problem. (i.e. – decomposing numbers by place value, working with properties, etc.). 	<ul style="list-style-type: none"> ○ Demonstrates and provides student's experiences with the use of various mathematical models. ○ Questions students to justify their choice of model and the thinking behind the model. ○ Ask students about the appropriateness of the model chosen. ○ Assists students in seeing and making connections among models. ○ Give students opportunity to evaluate the appropriateness of the model. ○ Encourages students to look at or something they recognize and have students apply the information in identifying solution paths (i.e. composing/decomposing numbers and geometric figures, identifying properties, operations, etc.). ○ Encourages students to connect task to prior concepts and tasks.

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Math Process Standard 5: Representation

Sub-Standards	Questions to Develop Mathematical Thinking
<p>1. Create and use a variety of representations appropriately and with flexibility to organize, record, and communicate mathematical ideas (e.g., dramatizations, manipulatives, drawings, diagrams, tables, graphs, symbolic representations). CCSS.MATH.PRACTICE.MP7 Look for and make use of structure.</p> <p>2. Use representations to model and interpret physical, social, and mathematical situations (e.g., counters, pictures, tally marks, number sentences, geometric models; translate between diagrams, tables, charts, graphs). CCSS.MATH.PRACTICE.MP5 Use appropriate tools strategically.</p>	<ul style="list-style-type: none"> ○ What mathematical tools could we use to visualize and represent the situation? ○ What information do you have? ○ What tool did you use to find the solution? ○ In this situation would it be helpful to use a graph..., number line..., ruler..., diagram..., calculator..., manipulative,...dramatization,... symbolic representation,... number sentences,... geometric model? ○ Why was it helpful to use ____? ○ What can using a _____ show us that _____ may not?
What does it look like in planning and delivery?	
<p>Tasks: elements to keep in mind when determining learning experiences</p> <ul style="list-style-type: none"> ○ Requires multiple learning tools. (Tools may include: manipulatives (concrete models), calculator, measurement tools, graphs, diagrams, etc.) ○ Requires students to determine and use appropriate tools to solve problems. ○ Requires students to demonstrate fluency in mental computations. ○ Asks students to estimate in a variety of situations: <ul style="list-style-type: none"> ▪ a task when there is no need to have an exact answer ▪ a task when there is not enough information to get an exact answer ▪ a task to check if the answer from a calculation is reasonable 	<p>Teacher: actions that further promote mathematical thinking</p> <ul style="list-style-type: none"> ○ Demonstrates and provides students experiences with the use of various math tools. ○ A variety of tools are within the classroom learning environment and readily available. ○ Asks student to explain their mathematical thinking with the chosen tool. ○ Asks students to explore other options when some tools are not available.

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Major Concepts for 3rd Grade

The Major Concepts are defined in PASS, however the educators at the convening used the testing blueprints to determine if some needed to be added. While these are the heaviest weighted standards for the assessment, **they are not all of the standards**. For a complete list of standards, refer to the first page of this document.

1. Develop an understanding of multiplication and division and acquire strategies for basic multiplication facts and related division facts (fact families).

Blueprint of Testing - 20% (Number Operations)

Student Performance

I can add and subtract 3 and 4 digit numbers using different strategies.

I can easily and accurately multiply facts up to 10 times 10, understanding the related division facts.

2. Develop an understanding of fractional parts and fraction equivalence.

Blueprint of Testing - 20% (Number Sense)

Student Performance:

I can use diagrams and models to compare and order equivalent and non-equivalent fractions.

I can create diagrams and models of equivalent and non-equivalent fractions.

3. Apply the concepts of time, money, temperature, and measurement to real life situations.

Blueprint of Testing - 18% (Measurement)

Student Performance:

I can choose the right tool and correctly measure length and weight of objects.

I can find the perimeter of an object.

I can add time.

I can tell and write time to the nearest 5 minutes.

I can read a thermometer and calculate temperature change.

I can make change from a 5 dollar bill.

4. Describe and analyze various properties of two- and three-dimensional shapes.

Blueprint of Testing - 14% (Geometric Properties)

Student Performance:

I can compare and classify shapes by attributes, sides and angles.

I can define attributes of shapes with the correct vocabulary.

I can create different figures using basic shapes.

Vertical Alignment of Learning Goals Kindergarten through Fourth Grades

Major concepts, defined by grade level in PASS, aligned with 3 rd Grade blueprint					
Kindergarten	1 st Grade	2 nd Grade	3 rd Grade	Blueprint 3 rd Grade	4 th Grade
Demonstrate an understanding of the relationship between numbers and quantities.	Demonstrate an understanding of whole number relationships.	Demonstrate an understanding of the base-ten system and place value within that system.	Develop an understanding of fractional parts and fraction equivalence.	20%	Develop quick recall of multiplication facts and related division facts (fact families) and fluency with whole number multiplication.
N/A	Demonstrate an understanding of basic addition and subtraction concepts and facts.	Demonstrate quick recall of addition and subtraction facts as well as fluency with multi-digit addition and subtraction.	Develop an understanding of multiplication and division and acquire strategies for basic multiplication facts and related division facts (fact families).	20%	Develop an understanding of decimals and their connection to fractions.
Demonstrate an understanding of the concepts of nonstandard and standard measurement.	Demonstrate an understanding of linear measurement skills.	Demonstrate an understanding of the use of appropriate units of measure in a variety of situations.	Apply the concepts of time, money, temperature, and measurement to real life situations.	18%	Develop an understanding of area and acquire strategies for finding area of two-dimensional shapes.
Identify the common geometric shapes.	Recognize and describe basic two- and three-dimensional shapes.	Use geometric properties and relationships to recognize and describe shapes.	Describe and analyze various properties of two- and three-dimensional shapes.	14%	Develop an understanding of geometric properties and relationships of shapes

Vertical Alignment of Blueprints 3rd through 6th Grades

This chart shows the vertical alignment of the OCCT Math Blueprints from 3rd through 6th grade. It was designed so you have an at-a-glance look at the progression of major concepts in each grade level as well as the percentage of the test which will be made up of that concept.

	3 rd Grade		4 th Grade			5 th Grade			6 th Grade		
Standard 1: Algebraic Reasoning: Patterns and Relationships	7	14%		7	14%		13	26%		13	26%
1.1. Algebra Patterns	2			3			5			4	
1.2. Equations	2			2			4		1.2. Expressions & Equations	4	
1.2. Number Properties	3			2			4			3	
									1.4. Solving Equations	2	
Standard 2: Number Sense and Operations	20	40%		18	36%		16	32%		15	30%
2.1. Number Sense	10			8			8			5	
2.2. Number Operations	10			10			8			10	
Standard 3: Geometry	7	14%		9	18%		7	14%		8	16%
3.1. Properties of Shapes	3		3.1. Lines	2		3.1. Circles & Polygons	4		3.1. 3-D Figures	2	
3.2. Spatial Reasoning	2		3.2. Angles	2		3.2. Angles	3		3.2. Congruent & Similar Figures	2	
3.3. Coordinate Geometry	2		3.3. Polygons	3					3.3. Coordinate Geometry	4	
			3.4. Transformations	2							
Standard 4: Measurement	9	18%		9	18%		7	14%		7	14%
4.1. Measurement	4			5			5		4.1. Circles	4	
4.2. Time & Temperature	2			2		4.2. Money	2		4.2. Conversions	3	
4.3. Money	2			2							
Standard 5: Data Analysis	7	14%		7	14%		7	14%		7	14%
5.1. Data Analysis	4			2			3			3	
5.2. Probability	4		5.2. Central Tendency	3		5.2. Central Tendency	2		5.2. Central Tendency	2	
			5.3. Probability	2		5.3. Probability	2		5.3. Probability	2	

Sample Pacing/Sequence Guide 3rd through 5th Grade Math PASS Objectives

This chart is intended as a starting point for a more specific pacing guide aligned with your district's school calendar. We recognize that not all districts operate on a 9 month schedule from September to May. This table provides guidance as to the general amount of time to be spent on each strand. It was created to aid in the vertical alignment and progression going through the 3rd through 5th grade Math OCCT using the Math OCCT blueprints as the reference points.

	September	October	November	December	January	February	March	April	May
3rd Grade									
Standard 1: Algebraic Reasoning									
Standard 2: Number Sense and Operations									
Standard 3: Geometry									
Standard 4: Measurement									
Standard 5: Data Analysis									
4th Grade									
Standard 1: Algebraic Reasoning									
Standard 2: Number Sense and Operations									
Standard 3: Geometry									
Standard 4: Measurement									
Standard 5: Data Analysis									
5th Grade									
Standard 1: Algebraic Reasoning									
Standard 2: Number Sense and Operations									
Standard 3: Geometry									
Standard 4: Measurement									
Standard 5: Data Analysis									

	Do not teach at this time
	Strands to be the focus of classroom instruction and assessment
	Strands to be practiced, reviewed and maintained through whole group instruction, centers, small groups, interventions, remediation, etc.

Sample Math Tasks

Number Operations

Major Concept: Develop an understanding of multiplication and division and acquire strategies for basic multiplication facts and related division facts (fact families).

- **I can add and subtract of 3 and 4 digit numbers using different strategies.**

Standard: PASS: Grade 3 Standard 2.2a (CCSS 3.NBT.A.2)

Math Task: Classroom Supplies

Link: <https://www.illustrativemathematics.org/illustrations/1315>

Synopsis: Students are asked to decide how to spend \$1000 on supplies and materials for their classrooms; students will have to make choices and be careful not to exceed the budget.

- **I can easily and accurately multiply facts up to 10 times 10, understanding the related division facts.**

Standard: PASS: Grade 3 Standard 2.2b.ii (CCSS 3.OA.B.7)

Math Task: Fact Triangles

Link: <http://www.scimathmn.org/stemtc/frameworks/312b-multiplication-divisionn>

Synopsis: Fact Triangles are tools used to help build mental arithmetic skills. Fact Triangles are effective for helping students memorize facts because of their emphasis on relationships in a fact family. To use the Fact Triangles,

- ask students to write or say the four equations that represent the fact family for the numbers on the card
- cover one of the numbers and ask students to identify the missing number for the fact family. Once the missing number has been identified, students can write all four equations for the fact family.

Number Sense

Major Concept: Develop an understanding of fractional parts and fraction equivalence.

- **I can use diagrams and models to compare and order equivalent and non-equivalent fractions.**

Standard: PASS Grade 3 Standard 2.1b.ii (CCSS 3.NF.A.3)

Math Task: Snow Day

Link: <https://www.illustrativemathematics.org/illustrations/1453>

Synopsis: The purpose of this task is for students to investigate a claim about a comparison of two fractions in a context. Many fraction problems are set in food contexts or a situation where a physical thing is being shared. It is important for students to work on more abstract quantities like time as well.

- **I can create diagrams and models of equivalent and non-equivalent fractions.**

Standard: PASS Grade 3 Standard 2.1b.ii (CCSS tag: 3.NF.3)

Math Task: Comparing Fractions

Link: https://www.georgiastandards.org/Common-Core/Common%20Core%20Frameworks/CCGPS_Math_3_Unit5FrameworkSE.pdf

Synopsis: This document is a comprehensive unit. For this learning goal, you will find the activity for comparing fractions on page 23. The students will create models of fractions that they can manipulate to find equivalent fractions.

Measurement

Major Concept: Apply the concepts of time, money, temperature, and measurement to real life situations.

- **I can add time.**

Standard: PASS Grade 3 Standard 4.2 a (CCSS tag: 3.MD.1)

Math Task: Every Breath You Take

Link: <http://illuminations.nctm.org/Lesson.aspx?id=931>

Synopsis: Students will calculate how many breaths in a given amount time and compare to another student.

- **I can tell and write time to the nearest 5 minutes.**

Standard: PASS Grade 3 Standard 4.2b

Math Task: Taking Time to Understand Telling time

Link: <http://maccss.ncdpi.wikispaces.net/file/view/Taking+Time+to+Understand+Time.pdf>

Synopsis: This is a NCTM Investigation including why and how we teach time and sample lessons.

- **I can read a thermometer and calculate temperature change.**

Standard: PASS Grade 3 Standard 4.2c

Math Task: Temperature Stations

Link: From a forum question on A to Z Teacher Stuff

<http://forums.atozteacherstuff.com/showthread.php?t=18681>

Synopsis: "Get three thermometers and a cup of ice and one with hot water. Have a third empty cup also. Place each thermometer in the cup and give them some time to adjust. Then I split the kids into three groups and give them recording sheets with the category: Hot Water, and a place to write the temperature down. Then they rotate to each cup and record. You can even copy each category: Hot water, Ice, and Air on to colored paper, red for hot, blue for ice and green or yellow for air. Then they glue each of the strips into a regular sheet of paper. It is a great experiment for them to see the difference between the temperatures. You can also leave the cups out overnight so they can see that they will all adjust to the air temperature."

Graph temps on a double bar graph of the temperatures when first measured and the temperatures the morning after. Students can journal what happened to the different substances' temperatures.

- **I can make change from a 5 dollar bill.**

Standard: PASS Grade 3 Standard 4.3

Math Task: Money Values

Link:

[http://users.manchester.edu/student/PKHazelton/ProfWeb/HazeltonPK230FLP\(3rd%20grade%20mathematics%20lesson%20plan\).pdf](http://users.manchester.edu/student/PKHazelton/ProfWeb/HazeltonPK230FLP(3rd%20grade%20mathematics%20lesson%20plan).pdf)

Synopsis: A complete lesson reviewing money values and concluding with store transaction simulations.

Geometry

Major Concept:

- **I can compare and classify shapes by attributes, sides and angles.**

Standard: PASS Grade 3 Standard 3.1 and 3.2

Math Task: Greedy Shapes

Link: [https://www.georgiastandards.org/Common-](https://www.georgiastandards.org/Common-Core/Common%20Core%20Frameworks/CCGPS_Math_2_Unit5FrameworkSE.pdf)

[Core/Common%20Core%20Frameworks/CCGPS_Math_2_Unit5FrameworkSE.pdf](https://www.georgiastandards.org/Common-Core/Common%20Core%20Frameworks/CCGPS_Math_2_Unit5FrameworkSE.pdf)

Synopsis: This document is a comprehensive unit. For this learning goal, you will find the activity for Greedy Shapes on page 23. This activity combines literacy and math through the reading of *The Greedy Triangle*.

- **I can define attributes of shapes with the correct vocabulary.**

Standard: PASS Grade 3 Standard 3.1 and 3.2

Math Task: Polygon Riddles

Link:

http://web.branson.k12.mo.us/school_links/elementary/snowdenm/shaperiddles/polygonriddles.htm

Synopsis: Have students try to solve the riddles on this site and then have them create their own polygon riddles for the class to answer.

- **I can create different figures using basic shapes.**

Standard: PASS Standard Grade 3 – Standard 3.2 (ccss 3.G.1)

Math Task: Shape Robot

Link: [https://www.georgiastandards.org/Common-](https://www.georgiastandards.org/Common-Core/Common%20Core%20Frameworks/CCGPS_Math_2_Unit5FrameworkSE.pdf)

[Core/Common%20Core%20Frameworks/CCGPS_Math_2_Unit5FrameworkSE.pdf](https://www.georgiastandards.org/Common-Core/Common%20Core%20Frameworks/CCGPS_Math_2_Unit5FrameworkSE.pdf)

Synopsis: This document is a comprehensive unit. For this learning goal, you will find the activity for Shape Robot on page 15. In this task students identify different shapes and create a robot from these shapes.