Curriculum Parent Overview (Grade 5)

MATHEMATICS

UNIT #1 PUZZLES, CLUSTERS, AND TOWERS (Multiplication and Division 1)

CONTENT FOCUS:
Students use arrays and number puzzles to learn about factors, multiples, and other properties of numbers. They solve equations using order of operations.
Students develop a number of strategies for solving 2-digit by 2-digit multiplication problems,, including breaking numbers apart, solving an equivalent problem, and solving related problems.
Students develop various strategies for solving division problems with 2-digit divisors and for interpreting the results.

UNIT FOCUS:

- Solving multiplication problems with 2-digit numbers: Students develop their understanding about the most effective strategies to solve multi-digit multiplication problems (using arrays and breaking numbers apart). Understanding the relationship between a number and its factors and being able to recognize patterns in multiples of a number are critical in developing these useful strategies.
- Understanding and using the relations between multiplication and division to solve division problems: The relationship between multiplication and division is the bridge into understanding how to solve division problems. Students use multiples, specifically focusing on the multiples of 10, to solve division problems.
- Writing and interpreting numerical expressions: Students' solutions should include steps that represent their thinking as they work toward solving multiplication and division problems with efficiency (developing effective ways to solve problems). Students will create story problems to match expressions and explain how each subproblem connects to the context.
    - Ex. If there are 48 classrooms with 27 students in each class, then a first step of 40 x 20 means that 20 students in each of the 40 classrooms are accounted for. A next step of 40 x 7 represents the remaining 7 students in each of the 40 rooms. Now there are 8 classrooms with 27 students in each classroom left to be dealt with in the problem .

MATHEMATICAL PRACTICES:
MP1: Make sense of problems and persevere in solving them.
MP7: Look for and make use of structure.

CONNECTIONS TO PREVIOUS CONTENT:
This unit builds on the work in Grades 3 and 4 as students developed an understanding of the operations of multiplication and division and the relationship between the two operations. It is expected that most students have the strategies to solve 2-digit by 2-digit and 4-digit by 1-digit multiplication problems, and understand how rectangular arrays and unmarked arrays can be used to represent multiplication problems.

CONNECTIONS TO FUTURE CONTENT:
Students continue practicing multiplication and division throughout the year and homework, in practice pages, and in solving problems and in later units. In Unit 4, students continue studying multiplication and division. They study and use the U.S. algorithm for multiplication and fluently solve division problems with up to 4-digit dividends and 2-digit divisors. They continue to investigate the properties of whole numbers and operations. This supports their work on computational fluency and understanding the base-10 number system. They apply this knowledge in Unit 7 as they work with multiplication and division of fractions and decimals, and this supports their work with integers and variables in later years.

MATH AT HOME:

- Play any of the following games with your child on Savvas Site after they have been introduced in the classroom:
    - Multiplication Compare (not until session 2.3)
    - Division Compare (not until session 3.6)
- Choose a 3 digit number. See how many equations or expressions you can create to equal that number.
- Review the Math Words and Ideas videos for this unit on Savvas Site

UNIT #2: PRISMS AND SOLIDS (3-D Geometry and Measurement)

CONTENT FOCUS:

Students study the volume of rectangular prisms by looking at patterns of boxes and by building rectangular prisms from connecting cubes. They use strategies and volume formulas

for finding the volume of any rectangular prism. They find the volume of solids composed of regular prisms by combining volumes.
Students measure the volume of a small rectangular prism using cubic centimeters. They build models of standard cubic units of volume (cubic inches and feet and cubic centimeters and meters).

UNIT FOCUS:

- Translating between two-dimensional and three-dimensional shapes: Throughout the unit, students develop their visualization skills and their understanding of relationships between 2-D pictures and the 3-D objects they represent. They create and determine the volume of boxes made from 2-D patterns and create box patterns to hold a certain number of cubes.
- Structuring rectangular prisms and determining their volume: Volume is an essential concept in students' learning of 3-D geometry. The work in this unit helps students to see that the volume of a solid (3-D figure) is the space that the solid takes up. Students develop this concept by mentally organizing cubes as stacks of rectangles, by building boxes and predicting then figuring out the number of cubes that will fit inside, and finally, applying those understandings to determine formulas for volume (LxWxH and areas of base x height).
  Students also find the volume of solids that are made up of separate rectangular prisms. They use the breaking apart strategy or seeing the solid as smaller parts of a whole to determine each part's individual volume before adding them together.
- Analyzing and interpreting data: Data are used to answer a question, to investigate an issue, or to provide information about something in the world that is of interest. After data have been collected, represented, and summarized, we have to decide what the data tells us.

MATHEMATICAL PRACTICES:
MP4: Model with mathematics.
MP5: Use appropriate tools strategically.
CONNECTIONS TO PREVIOUS CONTENT:
In earlier grades, students worked with 2-D and 3-D shapes-identifying shapes as being two-dimensional or three-dimensional; describing, identifying, comparing, and defining attributes of shapes; and composing and decomposing these shapes. In grades 3-4, student work in measurement focused on measuring accurately and finding perimeter and area. The work in this unit assumes students can measure accurately to the nearest half inch and have a generalized method for finding area
CONNECTIONS TO FUTURE CONTENT:
In future years, students continue to develop their understanding of the relationship between the linear measurements used to determine the dimensions of a solid and the volume of that solid. Students' ideas about volume from this unit include the strategies they developed for determining the volume of rectangular prisms and their understanding of volume as being additive. These ideas serve as building blocks for understanding formulas for calculating the volume of a variety of shapes.
MATH AT HOME:

- Using some type of building cube or block, try to build different solid shapes using the same number of cubes, then write the dimensions into the volume formula.
- Choose solid shapes (that are shaped like boxes) around the house and determine their volume using the volume formula. You'll need a ruler, yard stick, or measuring tape.

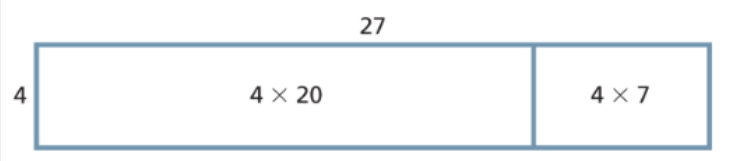
- Review the Math Words and Ideas videos for this unit on Savvas Site.

UNIT #3: MULTIPLE TOWERS AND CLUSTER PROBLEMS (MULTIPLICATION AND DIVISION 2)

CONTENT FOCUS:
Students solve multiplication problems with small 2-digit numbers by breaking the numbers apart and representing their solutions with arrays. Students solve and represent division problems in story contexts, including problems with remainders. Students examine the mathematical relationship that underlies the pattern they see when a number is multiplied by a multiple of 10. They develop strategies for solving multiplication problems with larger 2-digit numbers by breaking the problems apart in order to use number relationships that they know.

UNIT FOCUS:

- Solving multiplication problems with 2-digit numbers: As students learned the multiplication facts in Grade 3, they broke problems apart to help solve more difficult problems. As students solve problems involving 2-digit numbers in this unit, they develop more experience with breaking numbers apart in this way. Students might solve a problem like 4 x 27 for example, by breaking it into more familiar parts, such as 4 x 20 and 4 x 7. Students can also use arrays to make sense of and explain how they break apart problems into smaller, manageable parts. For example:



- Understanding and using the relationship between multiplication and division to solve division problems: Multiplication and division are related operations. A problem situation that students identify as division can be solved by either multiplication or division. For example, if 84 apples are put in bags with 6 apples in each bag, how many bags are needed? This problem can be written as either 84 ÷ 6 = ____ or ____ x 6 = 84. The inverse relationship between multiplication and division is one of the building blocks of later work in algebra.
- Understanding the meaning and structure of multiplication and division: Students build on their understanding of multiplication as they work on problems with 2-digit numbers and solve multiplication and division story problems, including problems about equal groups and multiplicative comparison problems. Students also encounter problems in which they must make sense of a remainder in the context of the problem.

MATHEMATICAL PRACTICES:
MP2: Reason abstractly and quantitatively.
MP7: Look for and make use of structure.

CONNECTIONS TO PREVIOUS CONTENT:
This unit builds on the work students have done in Unit 1. Students reviewed their multiplication facts, learned to solve multiplicative comparison problems, and used arrays to represent multiplication. They developed their understanding of the relationships between numbers and their factors and multiples in order to use these relationships to solve multiplication and division problems.

CONNECTIONS TO FUTURE CONTENT:
Students continue the work of developing strategies for solving multiplication and division problems in Unit 7. That unit will emphasize multiplication (4-digit by 1-digit, and 2-digit by 2-digit) and division (up to 4-digit dividends and 1-digit divisors) and ways to keep track of all the parts of a problem. Looking further, in Grade 5, students are expected to fluently multiply choosing from a variety of strategies, including the U.S. standard algorithm, and solve division problems with up to 4-digit dividends and 2-digit divisors. Grade 5 students also extend their understanding of place value and the properties of both operations as they learn to multiply and divide decimals.

MATH AT HOME:

- Play Small Array/Big Array or Missing Factors as a family. (accessible on the Pearson site)
- Model multiplication and division situations at home. Ask students to explain their thinking as they figure out real world situations.
- Review the Math Words and Ideas videos for this unit on Savvas Site.

UNIT #4: MEASURING AND CLASSIFYING SHAPES (GEOMETRY)

CONTENT FOCUS:
Students estimate and measure length in U.S. standard and metric units and convert larger measurements into smaller units. They also measure the perimeter of shapes. Students investigate the attributes of quadrilaterals and triangles. They focus on classifying polygons by the presence or absence of parallel lines and by angle size. Students use Power Polygon pieces and what they know about right angles to identify, construct, and measure angles of varying degrees. They are introduced to a new measuring tool, the protractor, to measure angle sizes. Students make and find symmetrical designs.

UNIT FOCUS:
- Solving measurement problems: In this unit, students will solve problems that involve length and distance measurements in several different ways. One challenge of measuring lengths is using tools correctly. Students focus on placing their tools in the correct position, leaving no gaps between each tool, reading the tools correctly, and keeping track of their measurements.
- Describing and classifying 2-dimensional figures: Geometric shapes can be sorted by various attributes, such as relative length or number of sides, number or size of angles, and absence or presence of parallel lines. Students begin by defining what a polygon is, then further classify polygons by the number of sides.
- Describing and measuring angles: In this unit, students examine angle size in relation to one kind of angle that they are familiar with from their work in previous grades - a right angle. With this as their reference point, students determine which angles are smaller than a right angle (acute) or larger than a right angle (obtuse).
- Understanding and determining area: Area is the amount of space a shape covers. In this unit, students deepen their understanding of area, leading to identifying and using a generalizable method of multiplying the dimensions of a rectangle to determine its area.
- Identifying mirror symmetry in shapes: Students develop an understanding of mirror symmetry as they identify lines of symmetry in designs or shapes and create designs with mirror symmetry. Students use mirror symmetry to help them find the area of a shape (by finding the area of half a symmetrical shape and doubling it) and to determine whether two shapes or two parts of a shape have equal area.

MATHEMATICAL PRACTICES:
MP5: Use appropriate tools strategically.
MP6: Attend to precision.

CONNECTIONS TO PREVIOUS CONTENT:
The work in this unit builds on work students have done in previous grades that includes measuring with a variety of units of length, finding perimeter and area, and reasoning about 2-dimensional shapes and their attributes. The work in this unit assumes students are able to measure the length of objects, find the perimeter and area of shapes, and identify some attributes of shapes such as number and relative length of sides, and number of angles.

CONNECTIONS TO FUTURE CONTENT:
Students will continue to use attributes of shape to classify, categorize, and define various geometric shapes as this work on classifying shapes is extended in the next grade. The measurement work in this unit is extended in future grades to include converting different-sized units within a given measurement system and to understanding volume, including applying formulas to finding volume of rectangular prisms.

MATH AT HOME:
- Play “I Spy” Polygons and Angles. Find things around the house that fit a rule and play a guessing game. You might describe a mirror by saying, “I’m thinking of something in this room that has

two equal sides, at least two equal angles, and at least two parallel sides. What could it be?" Have your child identify objects that fit the rule.

- Symmetry Projects: The world is full of symmetrical objects. Look for objects that are symmetrical around the kitchen or outside while on a walk or a drive. You can also create art projects that use symmetry.
- Review the Math Words and Ideas videos for this unit on Savvas Site.

UNIT #5: LARGE NUMBERS AND LANDMARKS (ADDITION, SUBTRACTION, AND THE NUMBER SYSTEM)

CONTENT FOCUS:

Students study place value and the operations of addition and subtraction as they solve problems fluently. They compare different types of addition and subtraction strategies, including the U.S. standard algorithm. Students extend their understanding of place value to one million, and use what they know about place value and the operations to solve addition and subtraction problems involving 4- and 5-digit numbers.

UNIT FOCUS:

- Extending knowledge of the number system to 1,000,000: An important part of students' mathematical work in the elementary grades is building an understanding of the base-10 number system. This unit provides activities that develop knowledge about important landmarks in that system - numbers that are familiar landing places, that make for simple calculations, and to which other numbers can be related. Because our number system is based on powers of 10, the numbers 100, 1,000, and 10,000, as well as their multiples, are especially important landmarks. Students will develop a sense of the magnitude and relationships of these numbers.
- Adding and subtracting fluently: Throughout the unit, students solve addition and subtraction problems presented in contexts, such as travel measured in miles or kilometers, or as numerical problems. Students solve a variety of types of addition and subtraction problems in context. This unit introduces students to the U.S. standard algorithms for addition and subtraction.
- Describing, analyzing and comparing strategies for adding and subtracting whole numbers: Students have worked on addition and subtraction for several grades. Grade 4 students delve more deeply into the properties and behavior of these operations. Students describe and compare addition and subtraction strategies by focusing on the first steps of these methods. They also study *why* certain addition expressions are equivalent and *how* certain expressions in subtraction are related.

MATHEMATICAL PRACTICES:

MP7: Look for and make use of structure.
MP5: Use appropriate tools strategically.

CONNECTIONS TO PREVIOUS CONTENT:

This unit builds on the work students have done in Grade 3 on addition and subtraction, as they extended their ideas about place value and the operations of addition and subtraction. It is expected that most students are able to fluently solve addition and subtraction problems within 1,000.

CONNECTIONS TO FUTURE CONTENT:

Students will continue to practice addition and subtraction through Ten-Minute Math activities, practice pages, and homework throughout the rest of the year and Grade 5. In the next unit and in Grade 5, students will apply their knowledge of the operations of addition and subtraction to fractions and decimals.

MATH AT HOME:

- Look for large numbers in the newspaper, on packages, on signs, and around your home and neighborhood. Talk about the numbers. You might ask, “How much would the car cost if the salesperson offered a $2,000 discount? $2,500 discount?”
- Review the Math Words and Ideas videos for this unit on Savvas Site.

UNIT #6: FRACTION CARDS AND DECIMAL GRIDS (FRACTIONS AND DECIMALS)

CONTENT FOCUS:

UNIT FOCUS:

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MATHEMATICAL PRACTICES:

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CONNECTIONS TO PREVIOUS CONTENT:

CONNECTIONS TO FUTURE CONTENT:

MATH AT HOME:

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- Review the Math Words and Ideas videos for this unit on Pearson Site.

UNIT #7: HOW MANY PACKAGES AND GROUPS? (MULTIPLICATION AND DIVISION 3)

CONTENT FOCUS:

UNIT FOCUS:

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MATHEMATICAL PRACTICES:

MP

CONNECTIONS TO PREVIOUS CONTENT:

CONNECTIONS TO FUTURE CONTENT:

MATH AT HOME:

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- Review the Math Words and Ideas videos for this unit on Pearson Site.

UNIT #8: PENNY JARS AND TOWERS (ANALYZING PATTERNS AND RULES)

CONTENT FOCUS:

UNIT FOCUS:

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MATHEMATICAL PRACTICES:

MP

CONNECTIONS TO PREVIOUS CONTENT:

CONNECTIONS TO FUTURE CONTENT:

MATH AT HOME:

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- Review the Math Words and Ideas videos for this unit on Savvas Site.