Math Counts!

What to Expect in Your Child's Math Journey

Highlights at Learning at Each Grade Level - Transitional Kindergarten to Grade 8

Tools that Math Students Use - Transitional Kindergarten to Grade 2

Practice at Home - Transitional Kindergarten to Grade 2

Tools that Math Students Use - Grades 3-8

Practice at Home - Grades 3-8

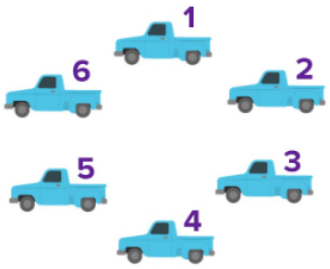
Online Resources for Math Learning

Eastside Union School District
Spring 2024

Highlights of Math Learning

Transitional Kindergarten

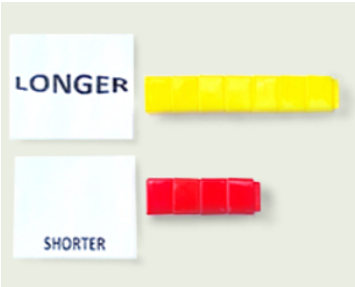
★ Count from 1 to 20.
★ Write numerals 0, 1, 2, 3, 4, and 5.
★ Count up to 10 objects drawn or organized in a line, array, or circle to answer questions.

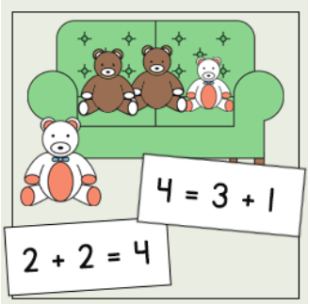


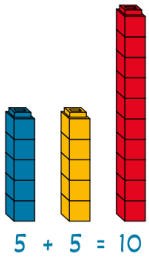
★ Given a number from 1 to 10, count that many objects.
★ Compare two groups of objects and determine which group has more or less, or if the two groups are equal.
★ Identify the first and last position in a line.
★ Explore addition and subtraction by using objects or fingers to solve questions posed in a situation or story problem.

Highlights of Math Learning **Kindergarten**

★ Count from 1 to 100 by ones and tens, starting from any given number.
★ Write numerals from 0 to 20.
★ Count up to 20 objects drawn or organized in any way to answer questions.
★ Given a number up to 20, count out that many objects.
★ Compare a group of objects to another, and determine if it has more or less.
★ Compare one numeral, from 1 to 10, to another and determine if it is more or less.
★ Using various strategies, add and subtract within 10 to solve one-step story/word problems involving addition or subtraction.
★ Identify and describe shapes.







Fluency in Kindergarten -

★ Know addition and subtraction facts within 5 from memory.

Highlights of Math Learning # First Grade

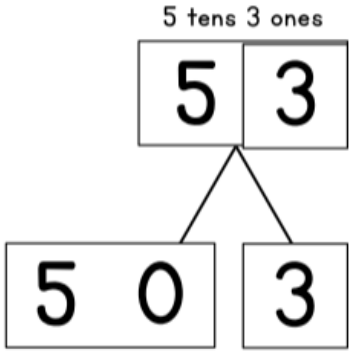
★ Using various strategies, add and subtract within 20 to solve one-step story/word problems involving addition and subtraction.

★ Using numbers from 0 to 20, understand that finding a missing part in an addition problem is the same as finding the result of a subtraction problem.

★ Understand that an equal sign means the quantities on both sides of the equation have the same value.

★ Solve an addition or subtraction problem with the unknown in any position.

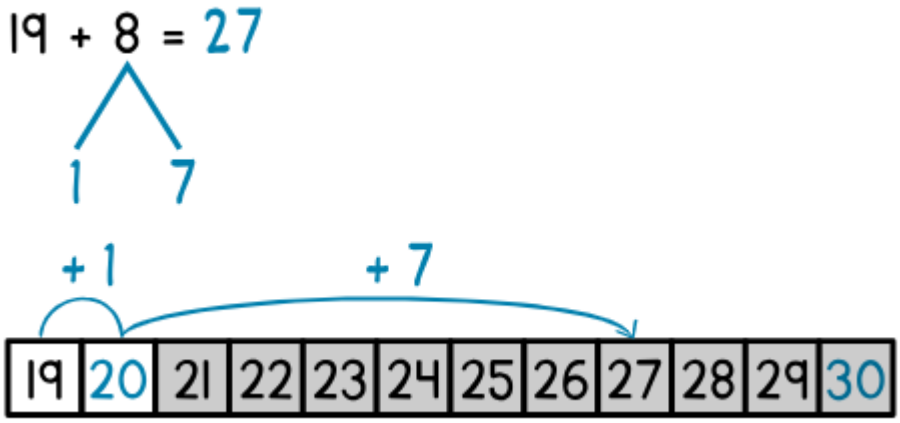
★ Understand the value of the tens place and the ones place in any two-digit number.



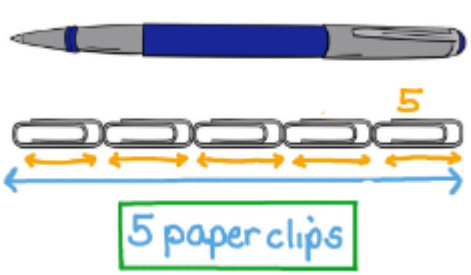
★ Compare 2 two-digit numbers using the symbols < (less than), > (greater than), and = (equal to).

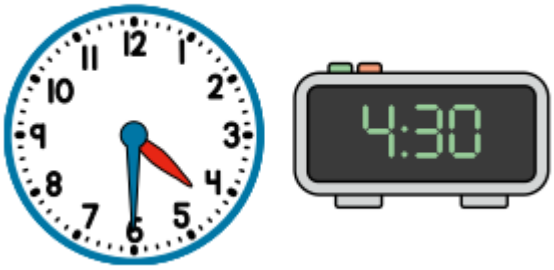
★ Given a number from 10 to 90, mentally add or subtract 1 or 10.

★ Given a two-digit number, add or subtract multiples of 10.
★ Add any two numbers between 0 and 100.



★ Order three objects from shortest to longest, or from longest to shortest.
★ Measure the length of an object using the same size “length units” (like paper clips or blocks) placed end to end with no gaps or overlaps.
★ Tell and write time to the nearest half hour.

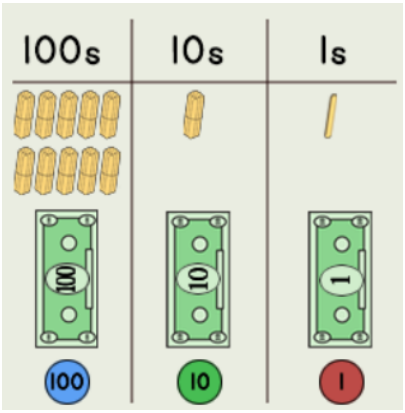




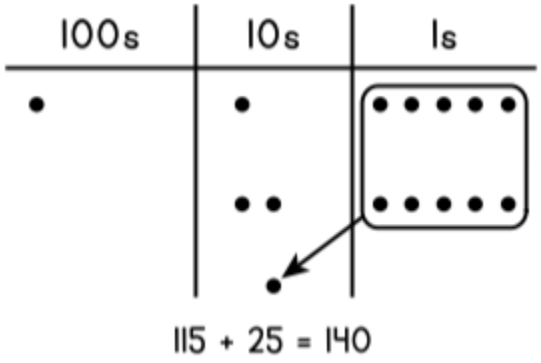
Fluency in First Grade -

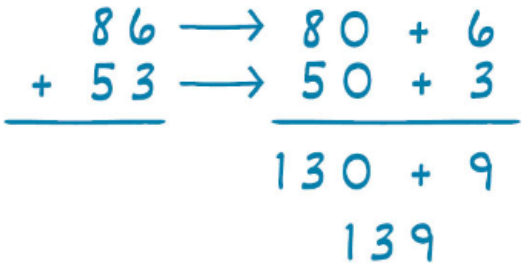
★ Know addition and subtraction facts within 10 from memory.

Highlights of Math Learning **Second Grade**

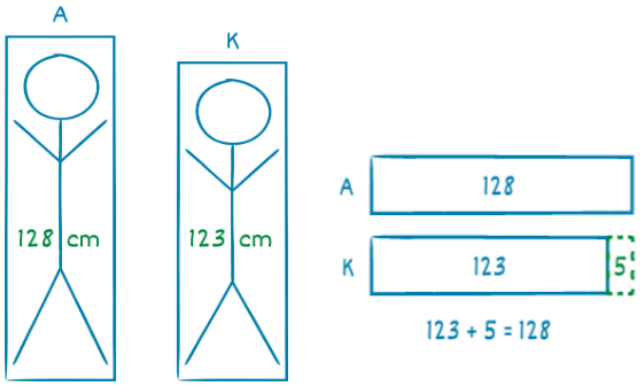


★ Given a number from 100 to 900, mentally add or subtract 1, 10, or 100.
★ Add up to 4 two-digit numbers.
★ Using numbers from 0 to 1,000, add or subtract two given numbers with or without regrouping.



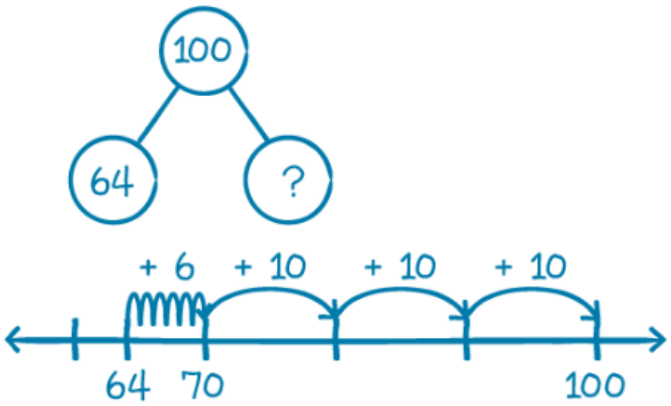


★ Explain strategies used for addition and subtraction using place value.
★ Using numbers from 0 to 100, solve one-step and two-step story/word problems involving addition and/or subtraction.
★ Use numbers from 0 to 100 to solve story/word problems involving length.



★ Represent a whole number as the length from 0 to that number on a number line.

★ Use a number line to show sums (addition) or differences (subtraction) within 100.



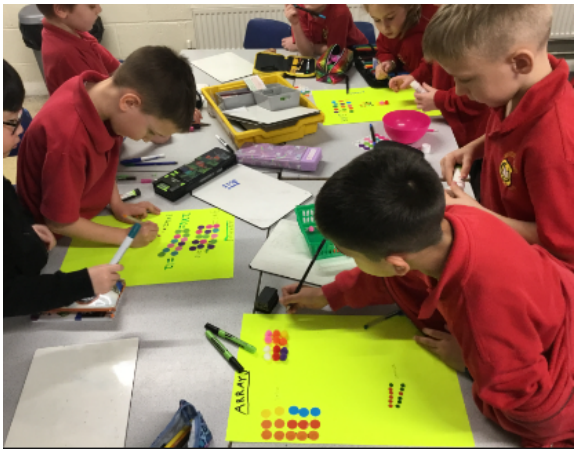
★ Measure objects to the nearest whole number using a ruler, a yardstick, meter stick, or measuring tape (centimeters, meters, inches, or feet).

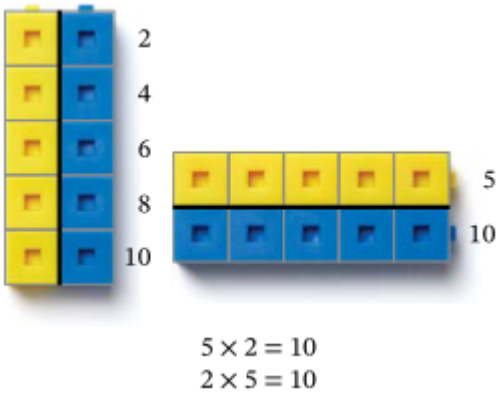
Fluency in Second Grade -

★ Know addition and subtraction facts within 20 from memory.

★ Add and subtract within 100.

Highlights of Math Learning # Third Grade





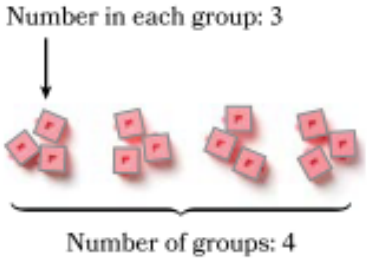
$5 \times 2 = 10$
$2 \times 5 = 10$

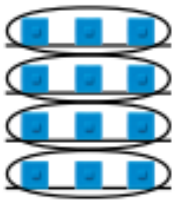
★ Explain the result of a multiplication or division problem.

★ Use multiplication and/or division (with results within 100) to solve story/word problems in situations involving equal groups or arrays, and in geometry when relating to area.

★ Understand that solving for a missing factor in a multiplication problem is the same as finding the result for a division problem.

★ Solve a multiplication or division equation with the unknown in any position.



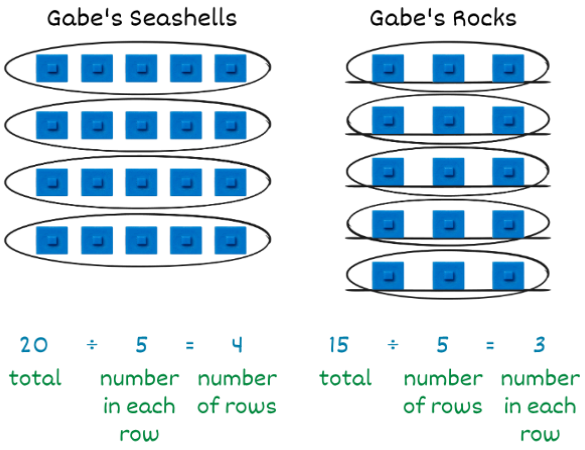


$3 + 3 + 3 + 3 = 12$
4 threes $= 12$
$4 \times 3 = 12$

Draw an array to show 4 rows of 3.

$4 \times 3 = 12$
factor factor product

★ Solve two-step story/word problems involving addition, subtraction, multiplication, and/or division.

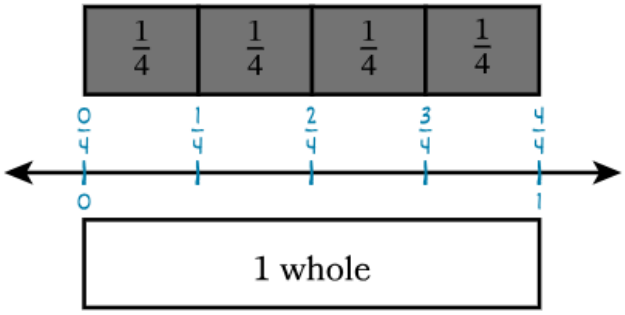


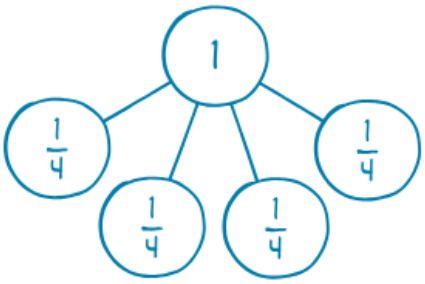
★ Understand a unit fraction is one part of a whole equally partitioned (e.g. ¼ is one of four equal quarters).*

★ Understand the numerator of a fraction is the number of equal parts (e.g. ¾ represents 3 equal pieces of ¼).*

★ Understand and represent a fraction on a number line.*

★ Compare fractions by reasoning about their size. *





Fluency in Third Grade -

★ Know the product (result of multiplication) of any two one-digit numbers from memory.

★ Add or subtract within 1,000 using various strategies.

** Note: Denominators in third grade are limited to 1 (whole numbers), 2 (halves), 3 (thirds), 4 (fourths or quarters), 6 (sixths), and 8 (eighths).*

Highlights of Math Learning **Fourth Grade**

56,348
50,000 + 6,000 + 300 + 40 + 8
fifty-six thousand, three hundred forty-eight
56 thousands 3 hundreds 4 tens 8 ones

★ Recognize that in a multi-digit number, the value of each place is ten times more than the place to its right (e.g. the 4 in 3,430 is 10 times the value of the 4 in 346).
★ Read and write multi-digit numbers using base ten numerals, number names, and expanded form.
★ Compare two multi-digit numbers using <, >, or = to record the results.
★ Round numbers to any place.

millions	hundred thousands	ten thousands	thousands	hundreds	tens	ones
		1	6,	3	0	0
			1,	6	5	0

16,300 > 1,650

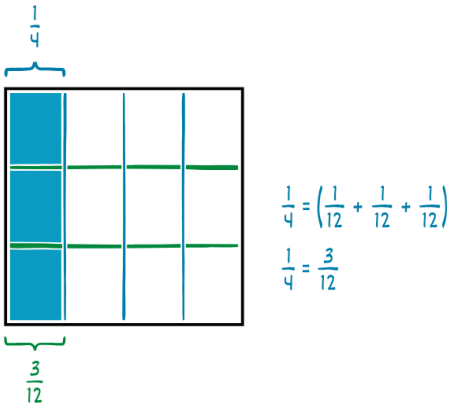
★ Distinguish between multiplicative and additive comparisons (e.g. 3 times as many versus 3 more than).
★ Use multiplication or division to solve problems involving multiplicative comparisons.
★ Represent problems with an equation using a symbol for the unknown value.
★ Solve multi-step word problems using addition, subtraction, multiplication, and/or division.

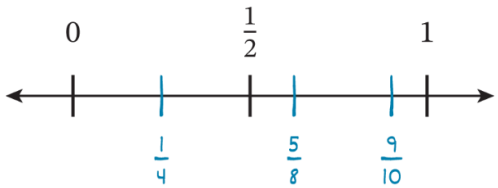
	30	2
6	$6 \times 30 = 180$	$6 \times 2 = 12$
10	$10 \times 30 = 300$	$10 \times 2 = 20$

$$\begin{array}{r} 32 \\ \times\ 16 \\ \hline 12 \\ 180 \\ 20 \\ +\ 300 \\ \hline 512 \end{array}$$

★ Interpret the remainder of a division problem in the context of that problem.

★ Understand when and why fractions are equivalent, using visual models and/or descriptions. Compare any two fractions.*





★ Add and subtract fractions with the same denominator. *

★ Use decimal notation for fractions with denominators of 10 or 100.

★ Compare two decimals to the hundredths by reasoning about their size.

★ Understand the concept of angle, and measure angles.

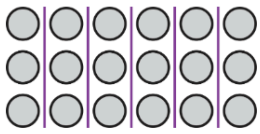
★ Classify shapes by their lines and angles.

Fluency in Fourth Grade -

★ Add and subtract within 1,000,000 using various strategies.

** Note: Denominators in fourth grade are limited to 1 (whole numbers), 2 (halves), 3 (thirds), 4 (fourths or quarters), 5 (fifths), 6 (sixths), 8 (eighths), 10 (tenths), and 12 (twelfths).*

Highlights of Math Learning **Fifth Grade**



$\frac{1}{6}$ of 18 is 3.

$\frac{3}{6}$ of 18 is 9.

★ Divide whole numbers into the thousands by two-digit numbers.

$926 \div 23$

Area Model

	30	10
23	690	230

690
+ 230
920

$926 - 920 = 6$

Quotient: 40

Remainder: 6

Vertical Form

10
30 Estimates:
23) 926 → $900 \div 30 = 30$
−690
236 → $230 \div 23 = 10$
−230
6

Quotient: 40

Remainder: 6

★ Recognize that in a multi-digit number, the value of each place is one tenth of the place to its left.

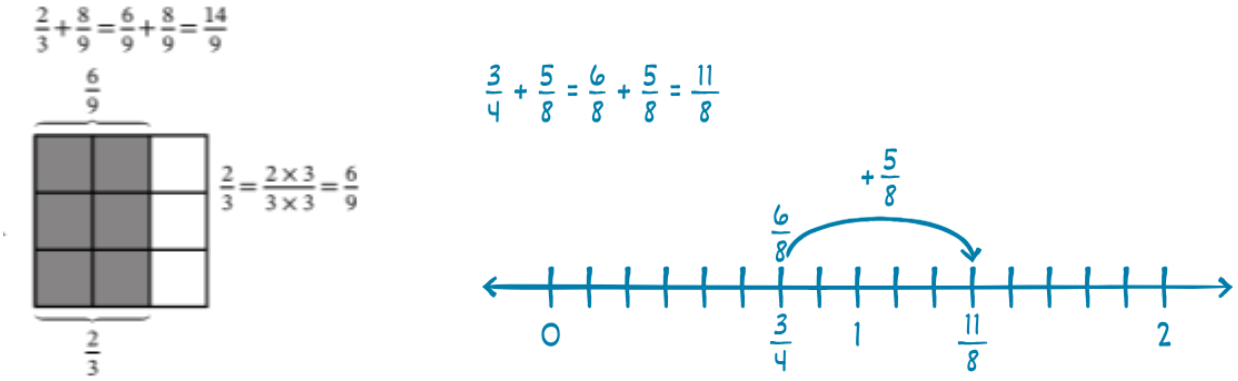
★ Understand each place value as a power of ten.

★ Read, write, and compare decimals to thousandths, and round decimals to any place.

★ Perform math operations with multi-digit whole numbers and decimals to the hundredths.

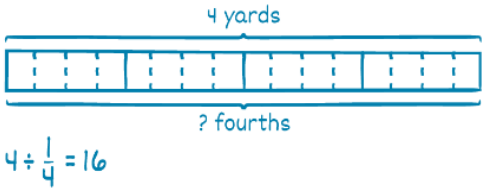
★ Interpret a fraction as division of the numerator by the denominator.

★ Use equivalent fractions as a strategy to add and subtract fractions.



★ Multiply a fraction and a whole number.

★ Divide whole numbers by unit fractions, and divide unit fractions by whole numbers.

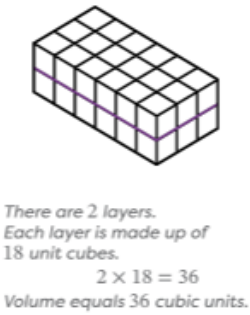


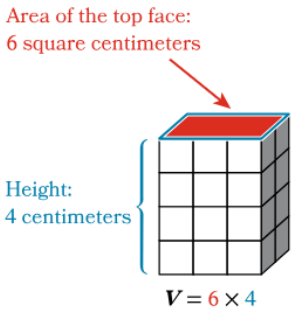
★ Solve real-world problems involving multiplication of fractions and mixed numbers.

★ Understand volume as space filled with equally sized cubes (e.g. cubic centimeters, cubic inches, cubic feet).

★ Solve real-world problems involving volume.

★ Understand and graph points in the first quadrant of the coordinate plane.

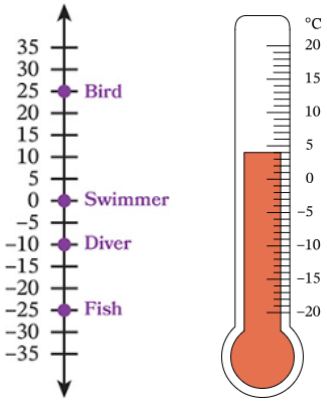


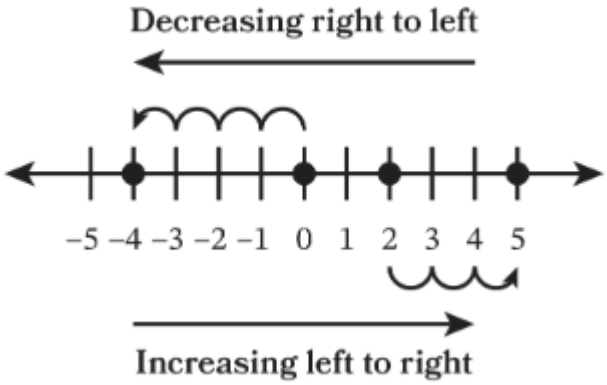


Fluency in Fifth Grade -

★ Multiply multi-digit numbers using a standard strategy or algorithm.

Highlights of Math Learning **Sixth Grade**

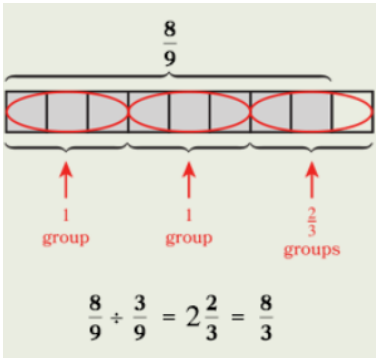




★ Understand that positive and negative numbers describe opposite directions or values.

★ Describe and represent real-world context using positive and negative numbers.

★ Use a number line to represent positive and negative numbers and their relationship to zero.



$$\frac{7}{8} \div 10 = \frac{7}{8} \div \frac{10}{1}$$

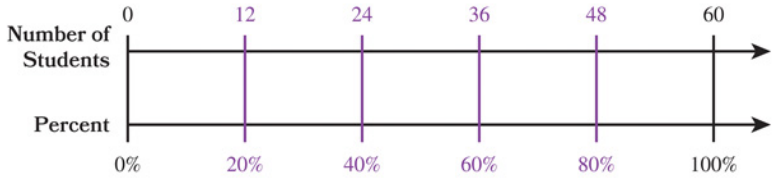
$$= \frac{7}{8} \times \frac{1}{10}$$

$$= \frac{7}{80}$$

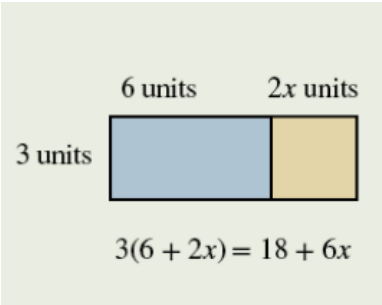
★ Compute and solve word problems using division of fractions.

★ Solve real-world problems using graphs and number lines.

★ Understand the concept of a ratio, and of a unit rate.



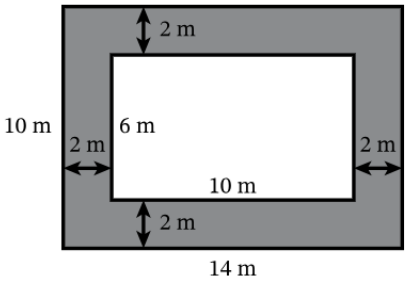
★ Use ratio and rate reasoning to solve real-world and mathematical problems.



Number of Kilograms of Sand	Number of Kilograms of Cement
3	4
6	8
9	12
12	16
15	20
60	80

×4 ×4

★ Write and evaluate expressions using exponents.
★ Write, read, and evaluate algebraic expressions. Identify and generate equivalent expressions.
★ Use a variable, or letter, to represent the unknown value in an algebraic expression.
★ Substitute values into algebraic equations and inequalities to determine whether the value makes it true or false.
★ Solve real-world and mathematical problems by writing and solving one-step algebraic equations.
★ Use two variables to represent a given situation or relationship.
★ Differentiate between dependent and independent variables in a given situation or relationship.
★ Solve real-life and mathematical problems involving area, surface area, and volume.



Fluency in Sixth Grade -

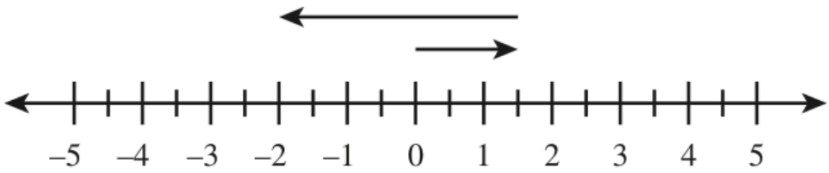
★ Solve multi-digit division problems using a standard strategy or algorithm.
★ Solve multi-digit decimal operations using standard strategies or algorithms.

Highlights of Math Learning **Seventh Grade**

★Extend understanding of addition, subtraction, multiplication, and division of fractions.

★Use computation with fractions to solve real-world and mathematical problems.

$$1.5 - 3.5 = 1.5 + (-3.5)$$



★Understand and use positive and negative numbers and fractions to solve problems.

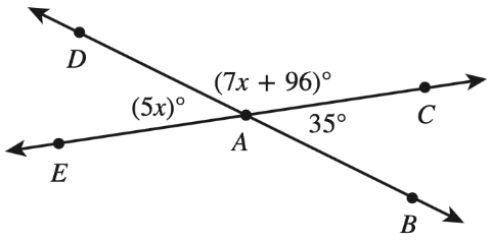
★Add, subtract, factor and expand expressions involving whole, fractional, positive and/or negative numbers.

Modeling the Distributive Property with a Tabular Model

	l	-2
8	$8l$	-16

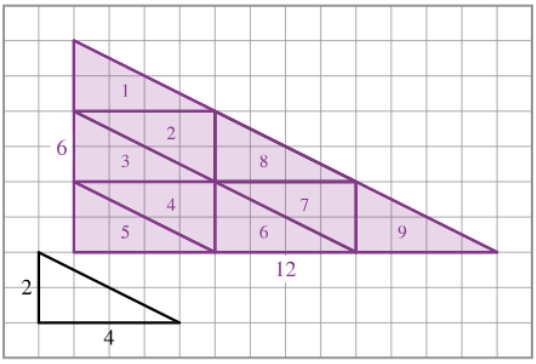
$$8\,(l - 2) = 8l - 16$$

Vertical Angles and Angles at a Point

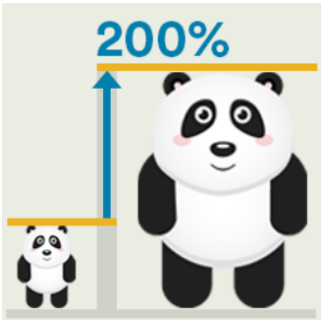


★ Represent real-world and mathematical problems using algebraic expressions. Use properties to generate equivalent expressions.

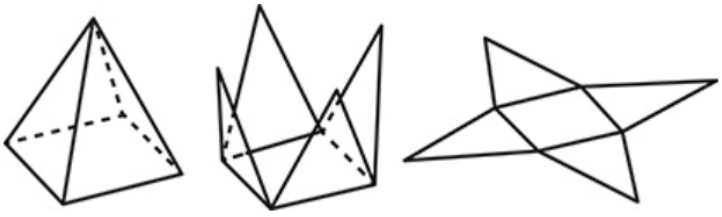
★ Recognize and represent relationships between two quantities.



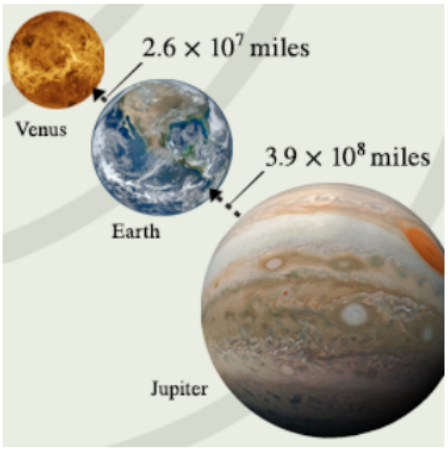
★ Use ratios and proportions to solve real world and mathematical problems.

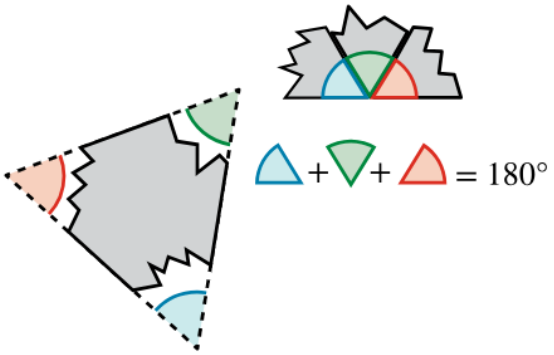


★ Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.



Highlights of Math Learning **Eighth Grade**



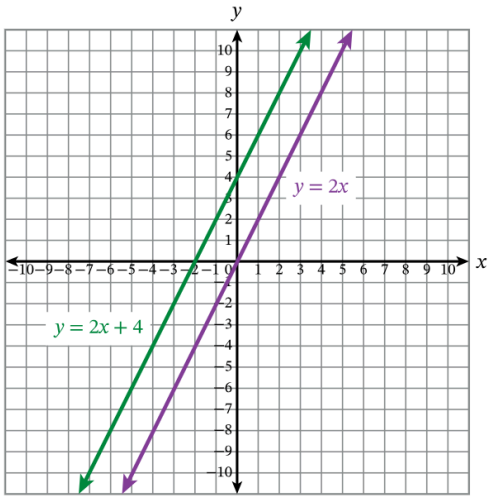


★Know that there are numbers that are not rational, and approximate them by rational numbers.

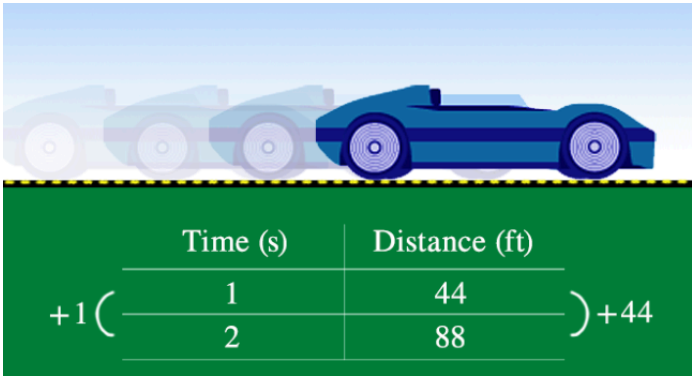
★Work with radicals and integer exponents.

★Understand the connections between proportional relationships, lines, and linear equations.

x	$x + y = 6$	y
2.5	$2.5 + y = 6$	3.5
0.25	$0.25 + y = 6$	5.75
0.5	$0.5 + y = 6$	5.5



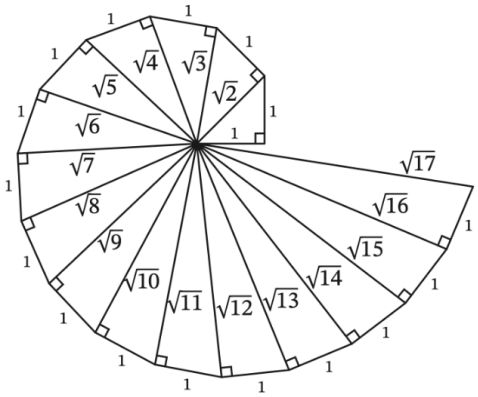
★Analyze and solve linear equations and pairs of simultaneous linear equations.



★Define, evaluate, and compare functions.

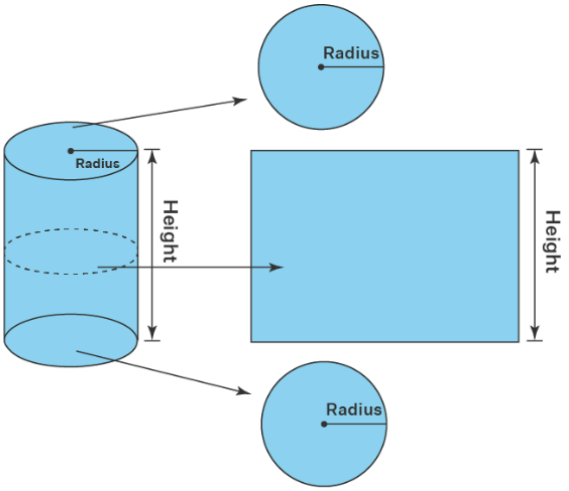
★Use functions to model relationships between two quantities.

★Understand congruence and similarity using physical models, transparencies, or geometry software.



★Understand and apply the Pythagorean Theorem.

★Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres.

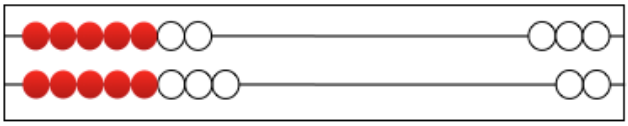


Tools Math Students Use in TK-2nd Grade

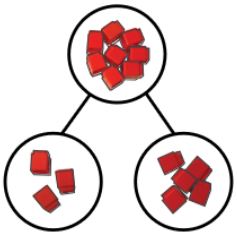
Counting Collections - Groups of items for students to count in any arrangement they choose, and record. Students will begin to arrange their collections in rows, or efficient groups, as they practice with their collections. A collection can be toys, beans, rocks, buttons, or anything that a student can handle.

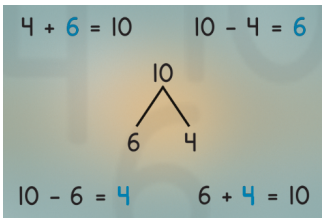
Rekenreks - A unique tool that allows children to develop number sense at their own pace. With the built-in 5 & 10 structure, rekenreks help children build number relationships that lead to more advanced strategies, such as making tens.

Model of 7+8=15

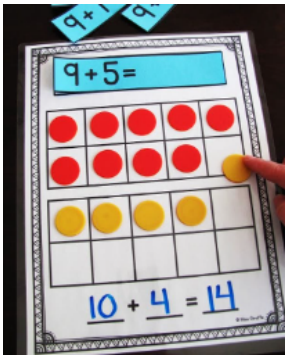


Math Mountains/Number Bonds - Students use Number Bonds to show a total (or whole) and two parts. Students can imagine that the total splits into two parts that roll toward the opposite two sides.

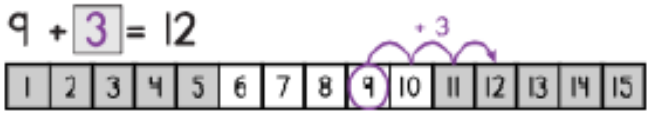




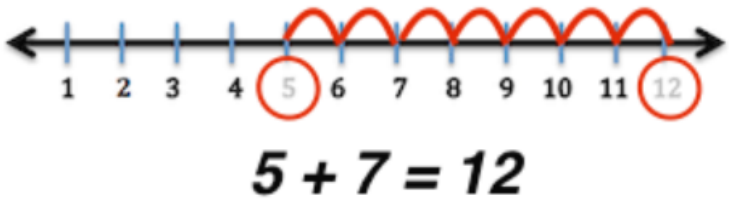
Five and Ten Frames - The ten frame makes use of the concept of benchmarking numbers 5 and 10. This helps the students create visual images in their mind for each of the numbers as students are learning to count and create number families, as well as become flexible with numbers.



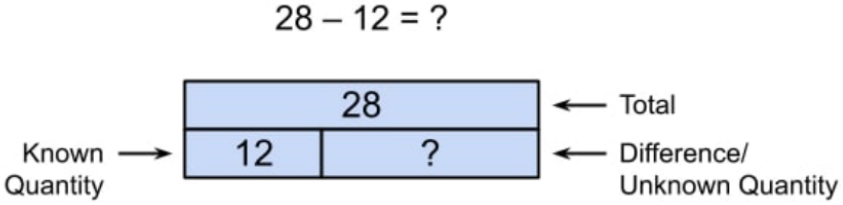
Linking Cubes and Number Paths - Linking cubes are the first visual of a number line to students. Students use linking cubes and other tools to begin comparing lengths. As students' progress in their learning of comparing numbers, they will be introduced to a tool, the Number Path. The Number Path allows students to count on from other numbers, and practice early addition and subtraction.

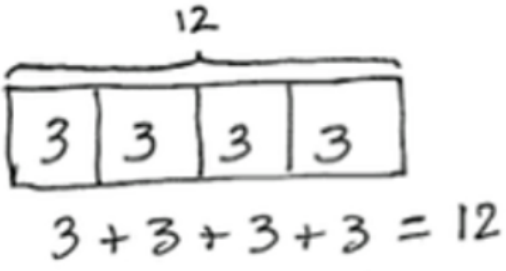


Number Lines - Building from a Number Path, Number Lines are straight lines that show numbers spaced evenly apart. They help students build fluency and confidence, and show how numbers build and compare to one another. When practicing math strategies, students may use an open number line (in blue) to count forward or backward similar to how they see the numbers on a number line.

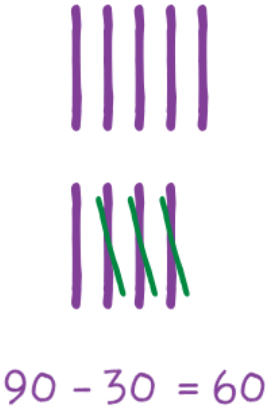


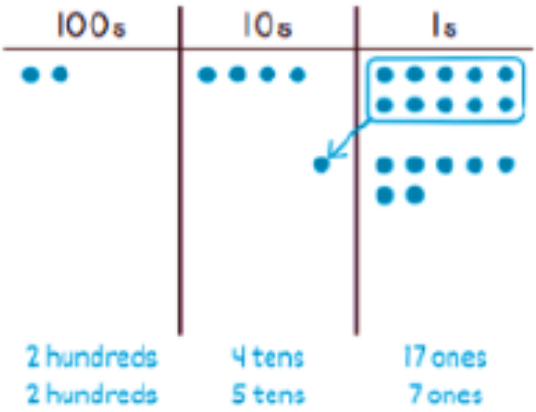
Tape Diagrams - A tape diagram is a pictorial model students can draw to represent a mathematical relationship or to develop understanding of a math concept.





Place Value Blocks and Diagrams - Place Value (or Base Ten) Blocks and Diagrams can be used to allow students to discover and explore the structure of our place value system. By building numbers with the blocks, students begin to see that a bundle of ten ones makes ten. And ten tens make one hundred. And ten hundreds make one thousand. The place value of a digit increases by ten times as we move left on the place value chart and decreases by ten times as we move right.





Arrays - Beginning in primary grades, students create arrays of objects to show repeated addition, as well as to help them count groups of objects. Using arrays builds understanding of equal groups, and flexibility in understanding how multiplication works. For example, 4 x 3 can mean 4 + 4 + 4, or 3 + 3 + 3 + 3.

Hundred Charts - A hundred chart is a 10×10 square that typically contains the numbers 1-100. The numbers are in sequential order and, since our number system is base-10, this means that all numbers with the same ones digit can be found in the same column. This can begin to give children a basic understanding of place value. As students move through the primary grades, both knowledge of tens and ones, as well as addition and subtraction of larger numbers, can be found using a hundred chart.

Practice at Home for TK-2nd Grade

★ Read the *Family Letter (grades Kinder-2)* that will be sent home for each new topic from your teacher and the *Great Minds* math program. Each letter provides ideas for home math activities.

★ Play Dice, Card, and Board Games as part of a family game night. Students will learn much of their early counting skills through play.

★ Make counting a family activity. Count money, household items, pizza slices, jumping jacks, soccer kicks, or even play “ISpy” on a car ride to count cars of various colors.

★ Sort and count colors of candies, buttons, colors of pasta, or other objects at home. How would you sort the items (color, size, etc.)?

★ Count on from a number. For example, say that you are going to start counting at 35, and have your child count from 35 to 50, or so. Choose random numbers for your child to count on to the next number set.

★ Jump on number lines - use sidewalk chalk to draw, or objects in a line, for your child to count as he or she hops to the next spot.

★ Practice telling time, or counting the amount of time it will take to drive to a destination, do an activity, etc.

★ Practice with key counting and addition/subtraction skills
- Doubles - 2+2, 3+3, 4+4, through 10+10
- Fact Families - 2+3=5, 3+2=5, 5-3=2, 5-2=3
- Making Ten - pairs of numbers to make ten
- Skip Counting by 2, 5, 10

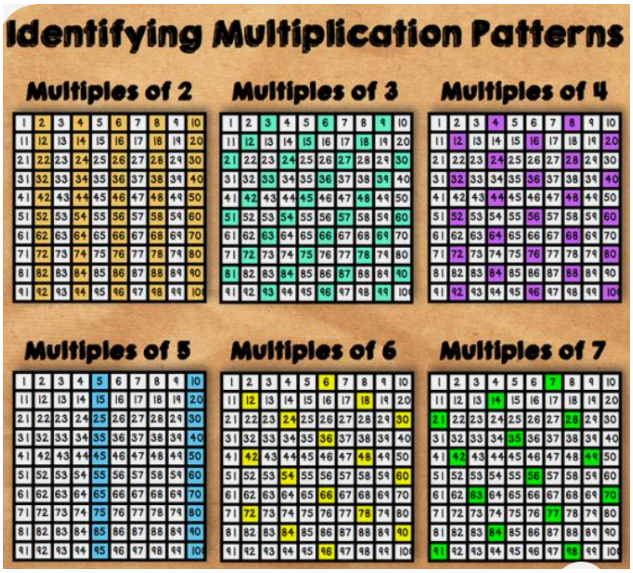
★ Go on a Shape Hunt at the supermarket, driving to a destination, or at home.

★ Use Sidewalk Chalk for your child to write numbers, make a large ten frame or number line, or challenge a parent.

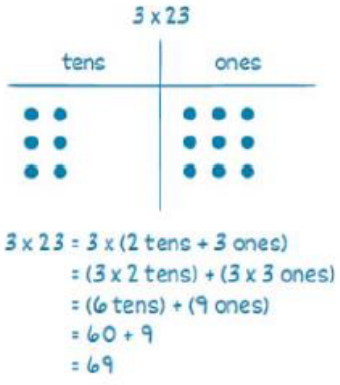
★ Read Math Books - include counting books and math-themed books when borrowing or purchasing books.

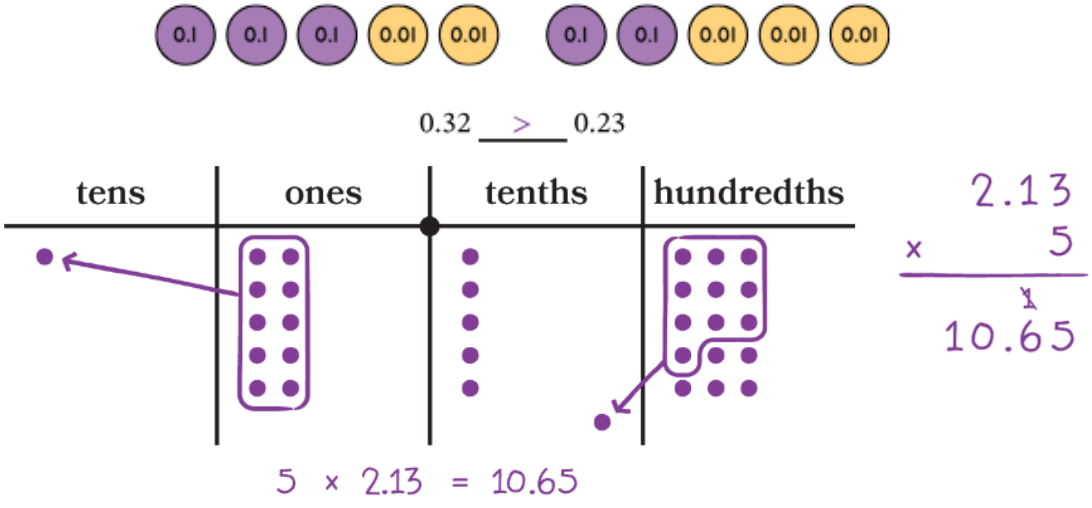
Tools Math Students Use in 3rd-8th Grades

Hundred Charts - In addition to working with tens and ones, the hundred chart can help students see patterns in numbers, round numbers, and be used as a guide to skip count as students are learning to multiply. Patterns and skip counting will come before students use a multiplication chart.

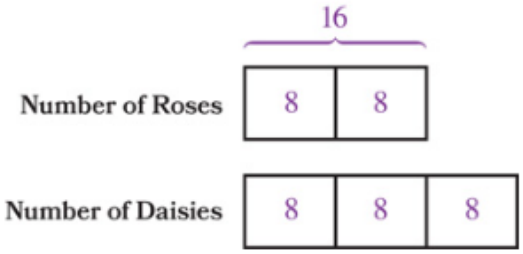


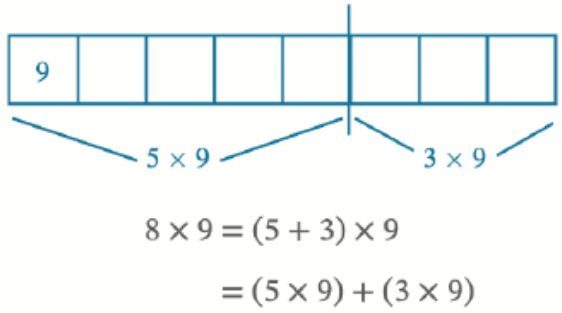
Place Value Diagrams, Blocks, and Disks - Work with place value tools extends as students learn to multiply and divide larger and smaller numbers, including operations with decimals.



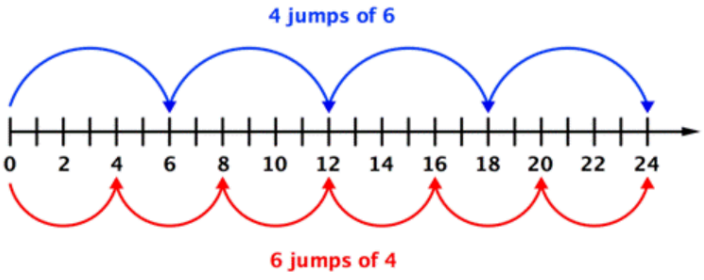


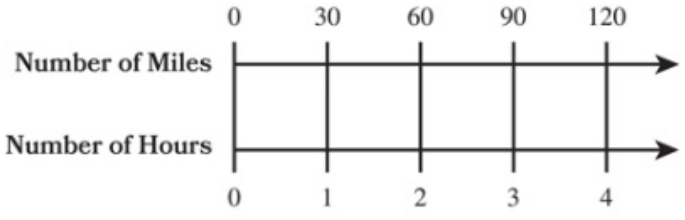
Tape Diagrams - Tape diagrams are useful for solving many different types of math problems but are commonly used with word problems. Studentsca n use a tape diagram to organize information and communicate their mathematical thinking.

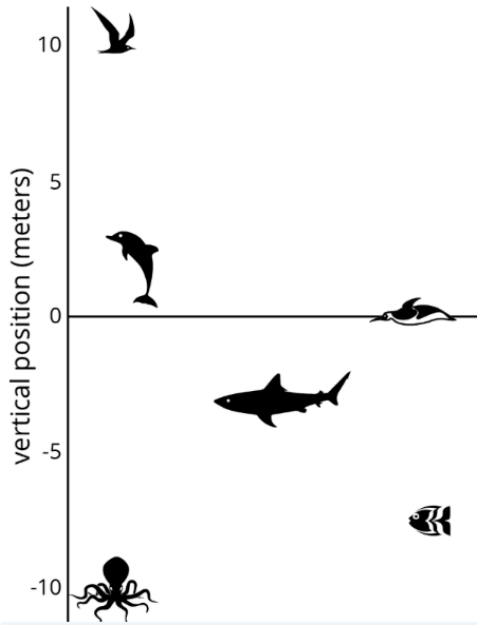




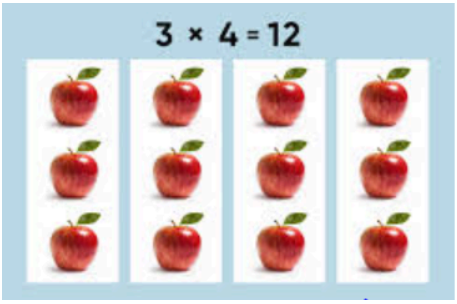
Number Lines - *As students learn how numbers compare to one another on a number line, they will begin to use this tool to model all four operations (addition, subtraction, multiplication, and division). In upper elementary and middle school, students will "jump" number lines to show repeated addition and subtraction (multiplication and division), will compare fractions and mixed numbers, and will model operations with negative numbers (including on vertical number lines). Students will also use double number lines to show comparisons using rates, ratios, and percentages.*





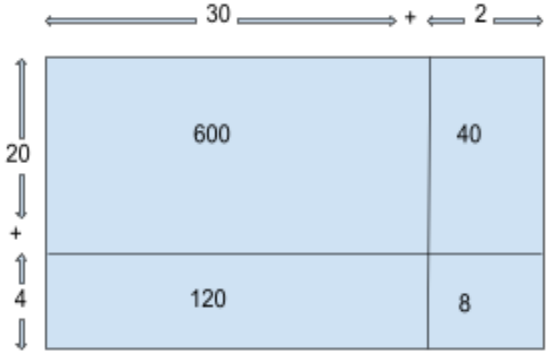


Arrays and Area Models - By using arrays in primary years, students can move to patterns of dots, symbols, and graphic representations to form equal groups and then to multiply numbers. This helps them to see quantities, and how many in each equal group.



As students learn multiplication in third grade and above, they will move from drawings or arrays of objects to sets of rectangles for representations. To represent area models, students will start with graph paper in order to show actual quantities in proportion. They learn how to break numbers down into smaller, manageable parts when multiplying, which helps build flexibility when working with larger numbers.

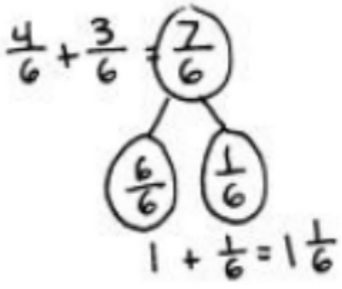
24 x 32



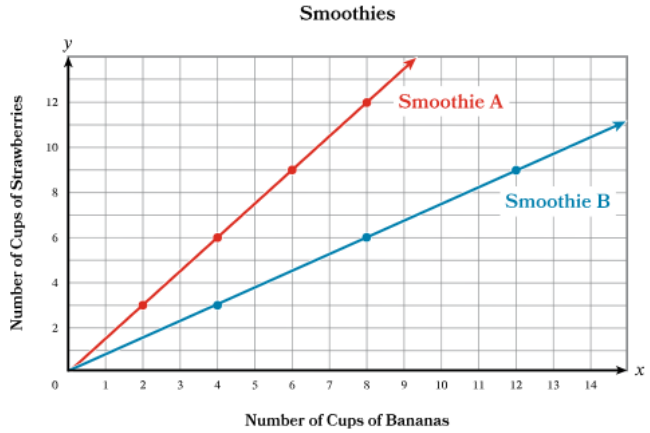
Find the area of each smaller part:
20 x 30 = 600
4 x 30 = 120
20 x 2 = 40
4 x 2 = 8

Now, just add the smaller areas to find the whole:
600
120
40
+ 8
768

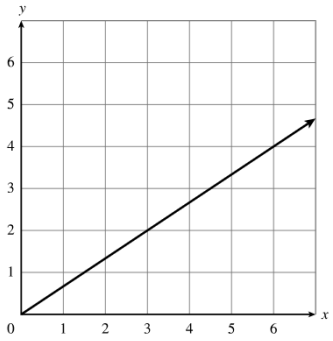
Number Bonds for Fractions - As with primary grades, students use Number Bonds to visualize a whole amount, and its parts. This can be done to help learning of fractions and decimals as well.



Charts and Graphs - students will begin to record and read charts and graphs from primary grades. The ability to create, read, and make use of charts and graphs will continue and extend to middle school as students plot data, graph linear equations, and explore probability and statistics.



Rice, x (cups)	Water, y (cups)
$\frac{3}{4}$	$\frac{1}{2}$
$2\frac{1}{4}$	$1\frac{1}{2}$
3	2
$3\frac{3}{4}$	$2\frac{1}{2}$



Practice at Home for 3rd-8th Grades

★ (3rd-5th Grades) Read the *Family Letter* that will be sent home for each new topic from your teacher and the *Great Minds* math program. Each letter provides ideas for home math activities.

★ Play Dice, Card, and Board Games as part of a family game night. Students will practice much of their numeracy skills through play.

★ Skip counting by numbers between 2-10, then fraction and decimal units.

★ Multiplication Facts Practice (flash cards and games)

★ Find fractions in everyday life - make a recipe together that uses fractional amounts in a measuring cup (½ teaspoon, ¾ cup, etc.). Split candies, pizza, sandwiches into equal groups. *What fraction of the brownies did we eat today, and how much is left?* Compare how many items of one color there are with another.

★ Shopping provides a great opportunity for students to estimate costs, figure out a discount (percent off), the cost if we buy more than one at the same price, add amounts with dollars and cents (decimals), and other skills.

★ Traveling on an errand or *a road trip allows your child to use math skills. Here are some examples: How much is the gas (cost per gallon) at the service station? How many miles per gallon does our car get? What is the distance to our destination? About how long will it take us if we are driving 65 miles per hour?*

★ As with younger students, playing games with Dice, Cards, and Board Games will help students build math skills. Adding in strategy games like *Battleship*, and games that practice fluency (multiplication, division, and fractions).

★ Sometimes upper elementary and middle school math is tricky for adults. Ask your child to teach YOU their day's math lesson.

Online Resources for Math Learning

Math Instruction Sites

iReady - via EUSD Student Classlink

Khan Academy for All Ages and Khan Kids App - www.khanacademy.org

Khan Academy Get Ready (grades 3-8) https://www.khanacademy.org/math/get-ready-courses

Math Game Sites - Skills Practice

Reflex Math and Frax - via EUSD Student Classlink

Games Sorted by Grade/Skills - https://www.mathplayground.com/

Making Math Fun at Home - https://www.scholastic.com/parents/school-success/school-success-guides/parent-guide-to-making-math-fun.html

Prodigy Math Games - https://www.prodigygame.com/main-en/