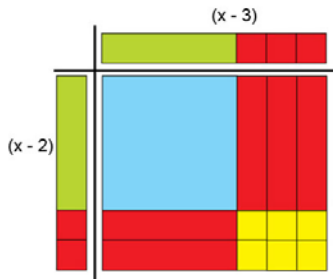
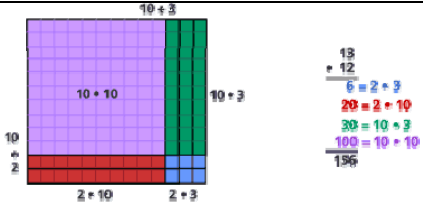
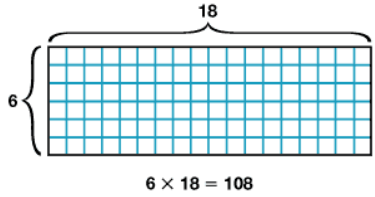

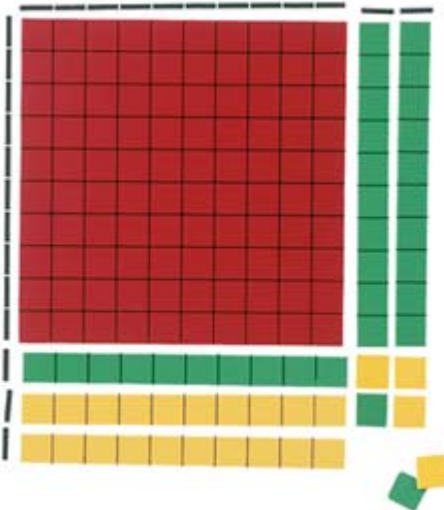
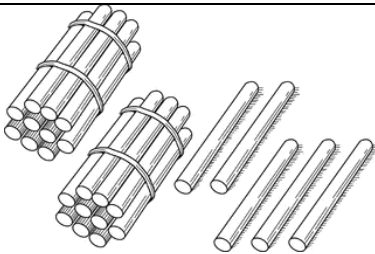

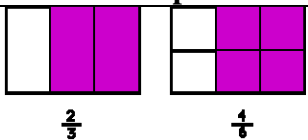
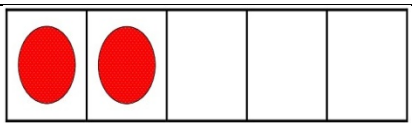
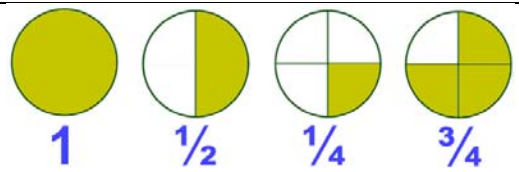
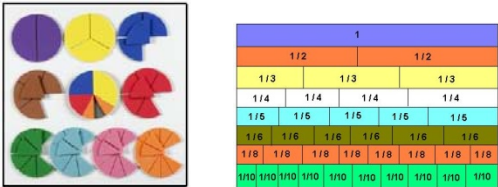






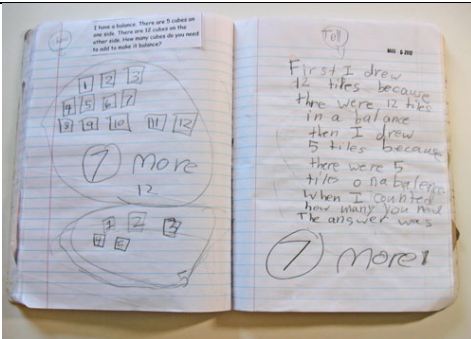
Term(s)	Definition	Example	Most common use?
algebra tiles	<p>Algebra tiles allow students to better understand ways of algebraic thinking and the concepts of algebra. They are a concrete representation of how algebra works.</p> <p>https://www.youtube.com/watch?v=8mZMssxt54A</p>		<p>6th: Understand that positive and negative numbers are used together to describe quantities having opposite directions or values, write expressions that record operations with numbers and letters standing for numbers, apply properties of operations to generate equivalent expressions, identify when two expressions are equivalent</p>
area model	<p>An area model is a model for math problems where the length and width of an array are used as factors to find the product, or total area, of the array.</p> <p>https://www.youtube.com/watch?v=5QZnVBIMhNs</p>		<p>3rd: Represent multiplication with an area model</p> <p>4th: Illustrate multiplication with area models</p> <p>5th: Illustrate division with an area model, illustrate subtraction of decimals, illustrate multiplication with an area model.</p>
array	<p>An array is an ordered arrangement of a product (total) shown in rows and columns.</p> <p>https://www.youtube.com/watch?v=c7UwNboK0I8</p>		<p>3rd: Represent multiplication with an area model</p> <p>4th: Illustrate multiplication with area models</p> <p>5th: Illustrate division with an area model, illustrate addition and subtraction of decimals, illustrate multiplication with an area model.</p>
attribute blocks	<p>Attribute blocks are used to practice sorting. A set of attribute blocks includes triangles, circles, squares, and rectangles of differing sizes and colors.</p> <p>https://www.youtube.com/watch?v=L-qWSXCUDbg</p>		<p>K: Name shapes, analyze and compare shapes, compose simple shapes to form larger shapes.</p> <p>1st: Compose shapes to create a composite shape.</p> <p>2nd: Recognize shapes that have specified attributes.</p>


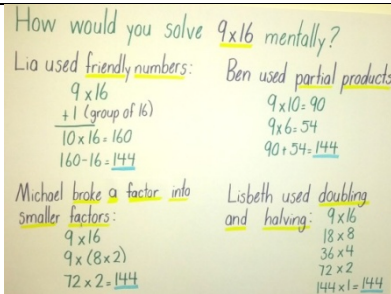
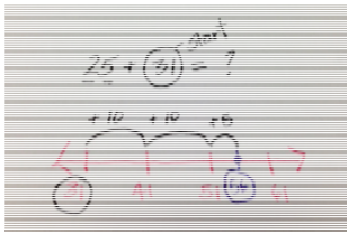
Term(s)	Definition	Example	Most common use?
base ten materials: units, strips, mats, dimension pieces	<p>Base ten blocks are used by students to learn patterning, addition, subtraction, number sense, place value, multiplication, area, and division. Units are the square pieces representing the ones place. Strips are ten units put together, representing the tens place. Mats are ten strips put together, representing the 100s place. Dimension pieces are little black segments used to define an array.</p> <p>https://www.youtube.com/watch?v=uJEGPx_BINU</p> <p>https://www.youtube.com/watch?v=Y7qkyMyanjU</p>		<p>K: Make numbers from 11-19</p> <p>1st: Represent two-digit numbers as tens and ones, add within 100, subtract multiples of 10</p> <p>2nd: Add and subtract within 100, represent numbers as hundreds, tens, and ones. Add and subtract within 1000</p> <p>3rd: Represent multiplication with an area model</p> <p>4th: Illustrate multiplication with area models</p> <p>5th: Illustrate division with an area model, illustrate addition and subtraction of decimals, illustrate multiplication with an area model</p>
bundle (group)	<p>In our math system, units are bundled or grouped into tens, hundreds, thousands, etc. Mathematicians designed bundling units, tens, etc. as an efficient way of counting.</p> <p>https://www.youtube.com/watch?v=-MU3idwwLBY</p>		<p>K: Make numbers from 11-19</p> <p>1st: Represent two-digit numbers as tens and ones, add within 100, subtract multiples of 10</p> <p>2nd: Add and subtract within 100, represent numbers as hundreds, tens, and ones. Add and subtract within 1000</p>
compose	<p>To compose means to build, or put together, to create a whole. Numbers and shapes are examples of math concepts that can be composed.</p> <p>https://www.youtube.com/watch?v=DFBM8NKuftU</p> <p>https://www.youtube.com/watch?v=QqTqlMsYeI</p>	<p>$12+12+12=36$</p> <p>6 triangles can be grouped to form a hexagon</p> <p>$4 \text{ groups of } 9 = 36$</p> <p>2 parallelograms can form a hexagon</p>	All grade levels


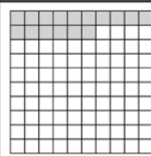
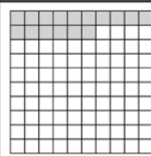
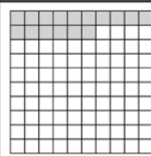
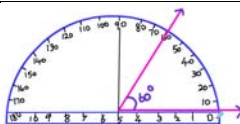
Term(s)	Definition	Example	Most common use?
cubes	<p>One-inch and one-centimeter cubes are commonly used to teach volume of prisms (three-dimensional shapes made from shapes such as triangles, squares, etc). Students are able to create a prism shape and then use the cubes to fill the shape. By counting the number of cubes used, students can determine the volume of the shape.</p> <p>https://www.youtube.com/watch?v=u_bucii-7yg8</p>		<p>5th: Measure volume by counting unit cubes (cubic cm and cubic inches)</p> <p>6th: Find the volume of right rectangular prisms</p>
decimal	<p>A decimal is an equal part of a whole number based on denominators that are limited to powers of 10. Decimals are written as numbers after a decimal point.</p> <p>https://www.youtube.com/watch?v=J4w2spaCky4</p>	$\begin{array}{r} 0.5 \\ \downarrow \uparrow \\ 5 \\ \hline 10 \end{array}$ $\begin{array}{r} 0.72 \\ \downarrow \uparrow \\ 72 \\ \hline 100 \end{array}$ $\begin{array}{r} 0.638 \\ \downarrow \uparrow \\ 638 \\ \hline 1000 \end{array}$	<p>4th: Use decimal notation for fractions with denominators 10 or 100, compare two decimals to hundredths by reasoning about their size</p> <p>5th: Read, write, and compare decimals to the thousandths; add, subtract, and divide decimals to the hundredths</p> <p>6th: Fluently add, subtract, multiply, and divide multi-digit decimals</p>
decompose	<p>To decompose a number means to break it down into component parts. There are multiple ways to decompose numbers. Shapes can also be decomposed.</p> <p>https://www.youtube.com/watch?v=kRt0zjTut-Q</p> <p>https://www.youtube.com/watch?v=VQqL01GBSxE</p>	<p>Decompose 36</p> $\begin{array}{ccc} 12+12+12 & 20+16 & 10+10+10+6 \\ 9 \times 4 & 12 \times 3 & 6 \times 6 \end{array}$ <p>Decompose a hexagon</p> <p>6 triangles</p> <p>2 parallelograms</p>	All grade levels
efficiency	<p>Efficiency in math means selecting tools and procedures in order to perform mathematics in the best possible manner with the least amount of time or effort.</p> <p>https://www.youtube.com/watch?v=2ZKiJXvAuI8</p>	<p>Students who are efficient in using arithmetic strategies will not count on their fingers to find the answer to $8+9$. They will use an addition strategy such as make a ten ($9+1+10$, then add 7 more).</p>	All grade levels

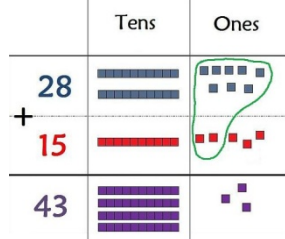
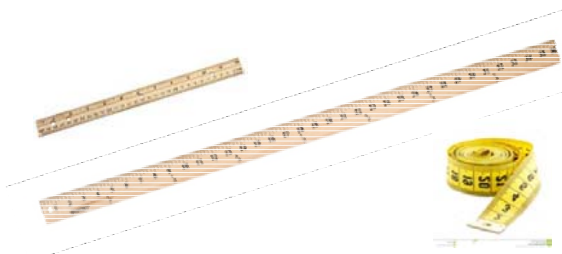
Term(s)	Definition	Example	Most common use?
equivalent fractions	Equivalent fractions name the same value, even though they have different numerators and denominators. https://www.youtube.com/watch?v=gEzbI82B9QI	 $\frac{2}{3}$ $\frac{4}{6}$	3rd : Explain equivalence of fractions 4th : Explain why fractions are equivalent 5th : Use equivalent fractions as a strategy to add and subtract fractions 6th : Apply and extend previous understandings of equivalent fractions
factor	A factor is a number that is multiplied by another number to make a product. https://www.youtube.com/watch?v=9zENZShozik	$5 \times 4 = 20$ 5 and 4 are both factors of 20	3rd : Fluently multiply and divide within 100 4th : Find all factor pairs for a whole number in the range 1-100 6th : Find the greatest common factor of two whole numbers less than or equal to 100
five frame	A five frame is a table consisting of 5 cells. Young children learn basic addition and subtraction using the 5 frame as a concrete tool and reference. https://www.youtube.com/watch?v=Jw8hgAPrACM		K : Fluently add and subtract within 5
fraction	A fraction is a numerical quantity that is less than one whole. The denominator defines how many equal pieces make a whole. The numerator explains how many equal pieces of the whole are being used, named, or defined by the fraction in question. https://www.youtube.com/watch?v=467_s6nDBfA https://www.youtube.com/watch?v=Ix72WMHYWas https://www.youtube.com/watch?v=SmkVsJxnMk	 1 $\frac{1}{2}$ $\frac{1}{4}$ $\frac{3}{4}$	1st : Partition circles and rectangles into two and four equal shares 2nd : Partition circles and rectangles into two, three, or four equal shares 3rd : Understand fractions and unit fractions, understand equivalent fractions, compare fractions with same numerators or denominators 4th : Explain fraction equivalencies, compare fractions with different numerators and denominators decompose fractions into unit fractions 5th : Add and subtract fractions with unlike denominators, solve word problems involving addition, subtraction of fractions 6th : Interpret and compute quotients of fractions, and solve word problems involving the division of fractions by fractions



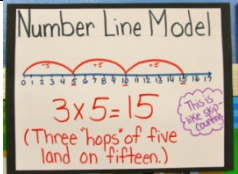
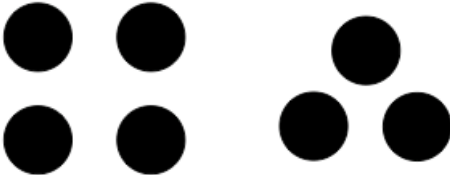
Term(s)	Definition	Example	Most common use?
fraction bars and fraction circles	<p>Sets of fraction bars or fraction circles provide visual illustration of math operations using fractions of whole numbers. They are also useful in understanding equivalent fractions.</p> <p>https://www.youtube.com/watch?v=-ve_CN5I1UM</p> <p>https://www.youtube.com/watch?v=ySG0JSR06fc</p>	 <p>The image shows two examples of fraction manipulatives. On the left, there are several fraction circles of different colors (purple, yellow, blue, brown, red, green, light blue, pink, orange) divided into various fractional parts like halves, thirds, fourths, fifths, sixths, eighths, and tenths. On the right, there are fraction bars of different colors (purple, yellow, light blue, green, brown, orange, red, pink, light green) also divided into various fractional parts, including halves, thirds, fourths, fifths, sixths, eighths, and tenths.</p>	<p>3rd: Understand fractions and unit fractions, understand equivalent fractions, compare fractions with same numerators or denominators</p> <p>4th: Explain fraction equivalencies, compare fractions with different numerators and denominators decompose fractions into unit fractions</p> <p>5th: Add and subtract fractions with unlike denominators, solve word problems involving addition and subtraction of fractions</p> <p>6th: Interpret and compute quotients of fractions, and solve word problems involving the division of fractions by fractions</p>
geoblocks	<p>Geoblocks are three-dimensional shapes used to teach students about geometrical features such as corners, edges, faces, symmetry, area, congruence, etc.</p> <p>https://www.youtube.com/watch?v=i_8zqc-hKMM</p>	 <p>The image shows several wooden geoblocks of different shapes and sizes, including cubes, rectangular prisms, triangular prisms, and pyramids, arranged in a cluster.</p>	<p>K: Name shapes, analyze and compare shapes</p> <p>1st: compose shapes to create a composite shape</p> <p>2nd: Recognize shapes that have specified attributes</p>
graduated cylinders, beakers	<p>Graduated cylinders or beakers are standard measuring tools used to develop understanding of liquid volume.</p> <p>https://www.youtube.com/watch?v=fWWLOzrjJw</p>	 <p>The image shows a row of laboratory glassware. From left to right, there is a tall graduated cylinder filled with purple liquid, a beaker filled with pink liquid, a graduated cylinder filled with red liquid, a graduated cylinder filled with orange liquid, a graduated cylinder filled with yellow liquid, a graduated cylinder filled with blue liquid, and a graduated cylinder filled with green liquid.</p>	<p>3rd: Measure liquid volumes using standard units of liters, solve one-step word problems involving volumes given the same units</p> <p>4th: know relative sizes of units (liter and milliliter), solve word problems involving masses</p> <p>5th: convert among different-sized standard measurement units: mL to liters, liters to mL</p>

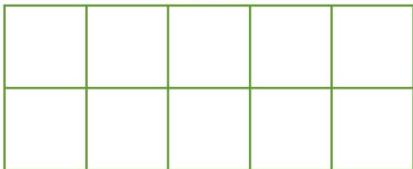

Term(s)	Definition	Example	Most common use?
Judy Clocks	<p>A specific brand of clock, the Judy Clock has an hour hand that moves according to the minute hand. This mimics the movement of traditional classroom clocks and is used to help students understand the functions of the hour and minute hands.</p> <p>https://www.youtube.com/watch?v=Oa3vybzZa6s</p>		<p>1st: Tell time to the hour and half-hour 2nd: Tell time to the nearest five minutes 3rd: Tell time to the nearest minute</p>
linking cubes	<p>Linking cubes are multicolored, two-centimeter cubes that can be attached together to make towers.</p> <p>https://www.youtube.com/watch?v=aT_3ew-4Yfc</p>		<p>K: Count and compare the number of objects, represent addition and subtraction with objects, use objects to show decomposition of numbers, find numbers that will make ten 1st: Represent addition and subtraction, connect to find the length of an object 2nd: Determine whether a group of objects is odd or even</p>
math journal	<p>A math journal is a place for students to write down their mathematical reasoning. Math journals can be notebooks, binders, folders, etc.</p> <p>https://www.youtube.com/watch?v=zEiwsO7rtw</p>		<p>All grade levels</p>
multiple	<p>A multiple is a number that can be divided by another number without any remainder.</p> <p>https://www.youtube.com/watch?v=ZO9PnNyAfcY</p>	<p>$5 \times 4 = 20$ 20 is a multiple of 5 and 4</p>	<p>4th: Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number 6th: Find the least common multiple of two whole numbers less than or equal to 12</p>

Term(s)	Definition	Example	Most common use?
money	<p>Money refers to standard US currency and coins: pennies, nickels, dimes, quarters, half-dollars, and dollars.</p> <p>https://www.youtube.com/watch?v=9n1FFcKi8Jw</p>		<p>2nd: Solve word problems involving money</p> <p>*After second grade, word problems include situations involving money, but money is not mentioned as a standard</p>
number bonds	<p>A number bond is a simple addition sum that can be recognized and completed almost instantly. Another term for number bonds is fact family.</p> <p>https://www.youtube.com/watch?v=QNOg7mYXNBU</p>	<p>3, 5, and 8 form a number bond:</p> $3+5=8$ $5+3=8$ <p>Which can also be extended to subtraction:</p> $8-5=3$ $8-3=5$	<p>K: Fluently add and subtract within 5</p> <p>1st: Fluently add and subtract within 10</p> <p>2nd: Fluently add and subtract within 20</p>
number talks	<p>Number talks are a teaching strategy designed to help students use their math reasoning to add, subtract, multiply and divide mentally.</p> <p>https://www.youtube.com/watch?v=RCPo334nPbQ</p> <p>https://www.youtube.com/watch?v=DQtgFaVqv7c</p>		<p>All grade levels</p>
open number line	<p>An open number line is a visual representation for recording and sharing students' thinking strategies during the process of mental computation. It can be created at any point along the continuum of numbers.</p> <p>https://www.youtube.com/watch?v=ucDucqYbffs</p>		<p>Begins in 2nd grade with the introduction of the ruler as a measuring tool. This is students' first exposure to numbers ordered sequentially in a line. From this first use of the ruler, students begin using the number line as a tool to explain mental math calculations.</p>

Term(s)	Definition	Example	Most common use?								
pattern blocks	<p>Pattern blocks are color-coded geometric shapes—yellow hexagons, tan and blue parallelograms, red trapezoids, orange squares, and green triangles. Pattern blocks are frequently used in geometry and fraction lessons.</p> <p>https://www.youtube.com/watch?v=pJ938Z4QrTY</p>		<p>K: Name shapes, analyze and compare shapes, compose simple shapes to form larger shapes</p> <p>1st: Put shapes together to create a new form</p> <p>2nd: Recognize shapes that have specified attributes (corners, angles, sides, etc.)</p>								
percent	<p>Percent means how many parts out of one hundred. Percents can be converted to fraction and decimal representations.</p> <p>https://www.youtube.com/watch?v=1CNZE8E48TA</p>	<table><tr><td></td><td>Fraction</td><td>Decimal</td><td>Percent</td></tr><tr><td></td><td>$\frac{16}{100}$</td><td>0.16</td><td>16%</td></tr></table>		Fraction	Decimal	Percent		$\frac{16}{100}$	0.16	16%	<p>6th: Find a percent of a quantity as a rate per 100</p>
	Fraction	Decimal	Percent								
	$\frac{16}{100}$	0.16	16%								
protractor	<p>A protractor is a standard measuring tool used to measure the angle created when two lines intersect, or meet.</p> <p>https://www.youtube.com/watch?v=t4xCOUNEInI</p>		<p>4th: Measure angles in whole-number degrees using a protractor</p>								
rate	<p>A rate is a special ratio in comparing two different units. The word per can replace the equal sign.</p> <p>https://www.youtube.com/watch?v=c6NQrt01dQQ</p>	<table><tr><td>1 minute = 60 seconds</td></tr><tr><td>1 hour = 60 minutes (or) 3600 seconds</td></tr><tr><td>1 day = 24 hours (or) 1440 minutes</td></tr></table>	1 minute = 60 seconds	1 hour = 60 minutes (or) 3600 seconds	1 day = 24 hours (or) 1440 minutes	<p>6th: Understand the concept of a unit rate associated with a ratio, use rate language in the context of a ratio relationship, use ratio and rate reasoning to solve real-world and mathematical problems</p>					
1 minute = 60 seconds											
1 hour = 60 minutes (or) 3600 seconds											
1 day = 24 hours (or) 1440 minutes											

Term(s)	Definition	Example	Most common use?												
ratio	<p>A ratio is a relationship between two numbers of the same kind. Ratios are usually expressed in the form $a:b$. They can also be expressed as fractions of a total.</p> <p>https://www.youtube.com/watch?v=TR5_eqmcp6c</p>	<table><tr><td>John's pocket money to Mark's pocket money</td><td>John : Mark</td><td>11 : 9</td></tr><tr><td>Mark's pocket money to John's pocket money</td><td>Mark : John</td><td>9 : 11</td></tr><tr><td>John's pocket money as a fraction of the total pocket money</td><td>$\frac{\text{John}}{\text{total}}$</td><td>$\frac{11}{20}$</td></tr><tr><td>Mark's pocket money as a fraction of the total pocket money</td><td>$\frac{\text{Mark}}{\text{total}}$</td><td>$\frac{9}{20}$</td></tr></table>	John's pocket money to Mark's pocket money	John : Mark	11 : 9	Mark's pocket money to John's pocket money	Mark : John	9 : 11	John's pocket money as a fraction of the total pocket money	$\frac{\text{John}}{\text{total}}$	$\frac{11}{20}$	Mark's pocket money as a fraction of the total pocket money	$\frac{\text{Mark}}{\text{total}}$	$\frac{9}{20}$	<p>6th: Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities, use ratio and rate reasoning to solve real-world and mathematical problems</p>
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Mark's pocket money as a fraction of the total pocket money	$\frac{\text{Mark}}{\text{total}}$	$\frac{9}{20}$													
rebundle (regroup)	<p>Rebundling or regrouping occurs during computation, especially addition, subtraction, and multi-digit multiplication. It involves composing a new bundle and moving it over to the next place value or decomposing a bundle and moving it back into a preceding place value.</p> <p>https://www.youtube.com/watch?v=TEyeYm2wxz0</p>		<p>2nd: Use place value understanding and properties of operations to add and subtract</p> <p>3rd, 4th: Use place value understanding and properties of operations to perform multi-digit arithmetic</p> <p>5th: Perform operations with multi-digit whole numbers and with decimals to hundredths</p> <p>6th: Compute fluently with multi-digit numbers</p>												
ruler	<p>A ruler is a standard measuring tool. Rulers can be straight edged but a tape measure is also a type of ruler. Rulers typically measure in inches and centimeters. Longer rulers, called yardsticks or meter sticks, measure in inches, centimeters, feet, and meters.</p> <p>https://www.youtube.com/watch?v=f0t0WPHcHUG</p>		<p>2nd: Measure length of objects using standard measuring tools</p> <p>3rd: Measure to the half and fourth of an inch</p> <p>4th: Know relative sizes of units: meter and cm, foot, inch and yard; measure to the nearest half, fourth, and eighth inch</p> <p>5th: Convert among different-sized units: inch to feet, cm to meter, foot to yard, Measure to the nearest half, fourth, and eighth</p>												

Term(s)	Definition	Example	Most common use?
spring scale	<p>A spring scale is a standard measuring tool used to determine the mass of objects.</p> <p>https://www.youtube.com/watch?v=twELB8y5vrg</p>		<p>3rd: Measure masses of objects using standard units of grams and kilograms, solve one-step word problems involving masses of the same units</p> <p>4th: Know relative sizes of units (grams, kilograms, pounds, ounces), Solve word problems involving masses</p> <p>5th: Conver among different sized standard measurement units (grams/kilograms)</p>
square inch tiles	<p>Square inch tiles are usually multi-colored and made from acrylic or plastic.</p> <p>https://www.youtube.com/watch?v=TRzFPYREXn0</p>		<p>K: Count and compare objects</p> <p>1st: Show addition and subtraction with objects, lay tiles end to end to show length of an object</p> <p>2nd: Determine if a group is odd or even, arrange tiles in arrays</p> <p>3rd: Represent multiplication as equal groups, represent division as making equal groups, represent multiplication as an array, measure area by counting unit squares</p>
student models	<p>Student models are how students show their mathematical reasoning about a problem. Models can include using manipulatives, sketches, diagrams, etc.</p> <p>https://www.youtube.com/watch?v=jzq-kuyhiqs</p>		All grades
subitize	<p>Subitize means to instantly recognize the quantity in a group of objects without having to count them. Most people are able to recognize the quantity in a group of up to 5 objects instantaneously.</p> <p>https://www.youtube.com/watch?v=9CsiwqujK-8</p>		K : Compare numbers; count to tell the number of objects

Term(s)	Definition	Example	Most common use?
ten frame	<p>A ten frame is two five frames put together. This is a tool used to build number sense and basic addition and subtraction fluency.</p> <p>https://www.youtube.com/watch?v=p6RaMGDPfJg</p>	<p style="text-align: center;">Ten Frame</p> 	<p>K: Understand addition as putting together and adding to, and understand subtraction as taking apart and taking from; work with numbers 11-19 to gain foundations for place value</p> <p>1st: Add and subtract within 20; understand place value</p>
two-colored counters	<p>Two-colored counters are circles with a different color on each side. These counters can be used to compose and decompose numbers and represent addition and subtraction.</p> <p>https://www.youtube.com/watch?v=D6bk0GvvXA</p>		<p>K: Count and compare the number of objects, represent addition and subtraction with objects, use objects to decompose numbers, find the number that will make ten</p> <p>1st: Represent addition and subtraction with objects</p> <p>2nd: Determine whether a group of objects is odd or even</p>