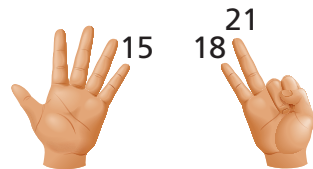


Teacher Glossary

5s shortcut A strategy for multiplying by numbers larger than 5. For example, to multiply 7×3 , students think of the 5 count-by of 3, 15. They then think of the additional count-bys of 3, 18, 21. Therefore, $7 \times 3 = 21$.



7 times 3 equals 21

A

addend One of two or more numbers to be added together to find a sum.

Example: $8 + 4 = 12$



adjacent (sides) Two sides of a figure that meet at a point.

Example: Sides *a* and *b* are adjacent.



A.M. The time period between midnight and noon.

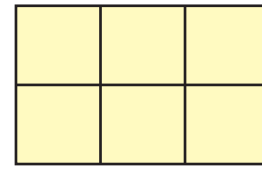
analog clock A clock with a face and hands.



angle A figure formed by two rays or two line segments that meet at an endpoint.

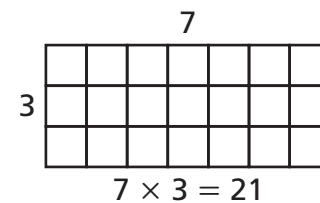


area The total number of square units that cover a figure.

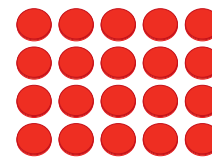


Example: The area of the rectangle is 6 square units.

area model A model that uses square units to show a multiplication.



array An arrangement of objects, pictures, or numbers in columns and rows.



Associative Property of Addition (Grouping Property of Addition) The property which states that changing the way in which addends are grouped does not change their sum.

Example: $(2 + 3) + 1 = 2 + (3 + 1)$
 $5 + 1 = 2 + 4$
 $6 = 6$

Associative Property of Multiplication (Grouping Property of Multiplication)

The property which states that changing the way in which factors are grouped does not change the product.

Example: $(2 \times 3) \times 4 = 2 \times (3 \times 4)$
 $6 \times 4 = 2 \times 12$
 $24 = 24$

axis (plural: axes) A reference line for a graph. A graph has 2 axes; one is horizontal and the other is vertical.

B

bar graph A graph that uses bars to show data. The bars may be horizontal or vertical.

benchmark A reference whose size is familiar to students and approximately equal to a unit of measure. A benchmark helps students visualize the size of the unit. Comparing a known benchmark to an item of unknown size helps students to make a reasonable estimate.

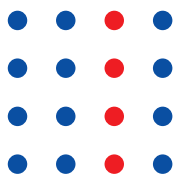
C

capacity The amount a container can hold.

centimeter (cm) A metric unit used to measure length. 100 centimeters = 1 meter

Class Multiplication Table A poster in table form that displays the multiplications for 1–9. Columns of the table are labeled 1–9 and rows are labeled 1–10. The product of the labels is found in the cells where the row and column meet.

column A part of a table or an array that contains items arranged vertically.



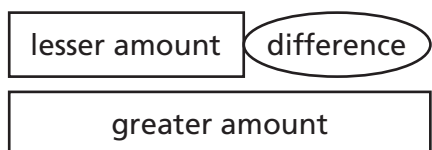
Commutative Property of Addition (Order Property of Addition) The property which states that changing the order of addends does not change the sum.

$$\text{Example: } 3 + 7 = 7 + 3 \\ 10 = 10$$

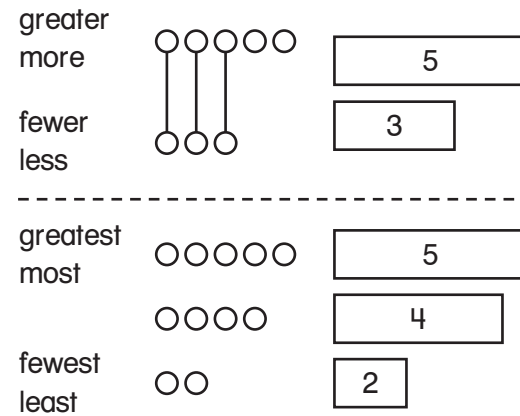
Commutative Property of Multiplication (Order Property of Multiplication) The property which states that changing the order of factors does not change the product.

$$\text{Example: } 5 \times 4 = 4 \times 5 \\ 20 = 20$$

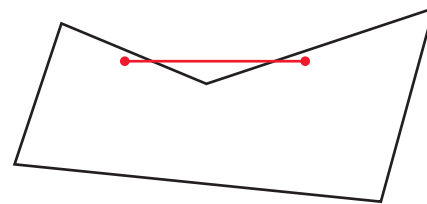
comparison bars Bars that represent the greater amount, lesser amount, and difference in a comparison problem.



comparison language



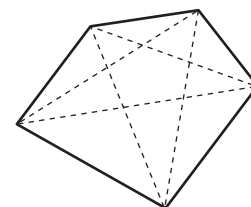
concave A polygon for which you can connect two points inside the polygon with a segment that passes outside the polygon.



congruent figures Figures that have the same size and shape. In this example triangles A and B are congruent.



convex A polygon is convex if all of its diagonals are inside it.



count-bys Products that are found by skip-counting a particular number; 5s count-bys would be 5, 10, 15, 20, 25, and so on; 3s count-bys would be 3, 6, 9, 12, and so on.

count on An addition or subtraction strategy in which students begin with one addend and count on to the total. This strategy can be used to find an unknown addend or an unknown total.

$$5 + 3 = 8$$

$$5 + 3 = 8$$

$$8 - 5 = 3$$

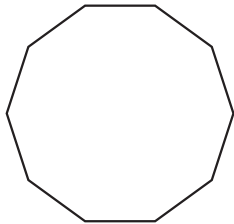
Already 5

cup (c) A customary unit of measure used to measure liquid volume (capacity). 2 cups = 1 pint
4 cups = 1 quart 16 cups = 1 gallon

D

data A set of information.

decagon A polygon with 10 sides.



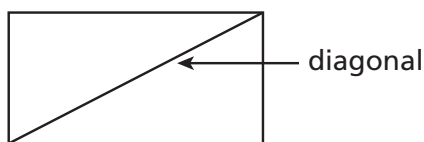
decimeter (dm) A metric unit used to measure length. 1 decimeter = 10 centimeters

Demonstration Secret Code Cards A larger version of the Secret Code Cards for classroom use. (See Secret Code Cards.)

denominator The bottom number in a fraction that shows the total number of equal parts in the whole.

Example: $\frac{1}{3}$ ← denominator

diagonal A line segment that connects two corners of a figure and is not a side of the figure.



difference The result of subtraction.

digit Any of the symbols 0, 1, 2, 3, 4, 5, 6, 7, 8, 9.

digital clock A clock that displays the hour and minutes with numbers.



dimension A way to describe how a figure can be measured. A line segment has only length, so it has *one* dimension. A rectangle has length and width, so it has *two* dimensions. A cube has length, width, and height, so it has *three* dimensions.

dimensions The measure of sides of geometric figures.

Distributive Property You can multiply a sum by a number, or multiply each addend by the number and add the products; the result is the same.

Example: $3 \times (2 + 4) = (3 \times 2) + (3 \times 4)$
 $3 \times 6 = 6 + 12$
 $18 = 18$

dividend The number that is divided in division.

Examples:

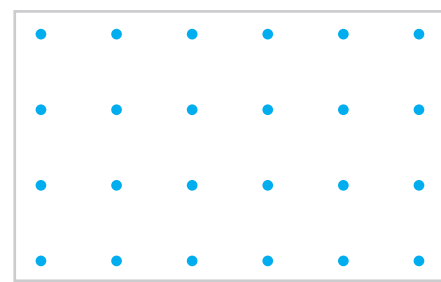
$12 \div 3 = 4$ $3 \overline{)12}^4$
 ↑ ↑
 dividend dividend

divisible A number is divisible by another number if the quotient is a whole number with no remainder. The number 6 is divisible by 3, but not 4.

divisor The number that you divide by in division.

Examples:
 $12 \div 3 = 4$ $3 \overline{)12}^4$
 ↑ ↑
 divisor divisor

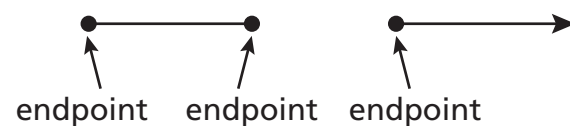
Dot Grid An arrangement of dots in rows and columns.



E

elapsed time The time that passes between the beginning and end of an event.

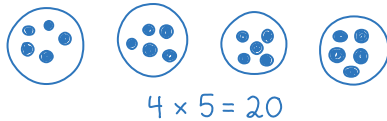
endpoint The point at either end of a line segment or the beginning point of a ray.



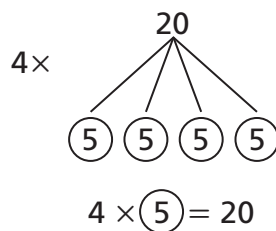
equal (=) Having the same value as that of another quantity or expression. $3 + 1 = 4$ is read as 3 plus 1 is equal to 4.

equal groups Concept used in multiplication and division situations. $5 \times 6 = 30$. There are 5 equal groups of 6 items.

Equal Groups drawing A drawing which students create that represents factors and products.



Equal Shares drawing A drawing which students create that represents factors and products. It is a numerical form of an Equal Groups drawing.



equality A statement that two expressions are equal.

equation A mathematical sentence with an equal sign.

Examples: $11 + 22 = 33$
 $75 - 25 = 50$

equivalence chain A series of equivalent fractions connected with equal signs.

$$\frac{1}{2} = \frac{2}{4} = \frac{4}{8} = \frac{8}{16}$$

equivalent Equal, or naming the same amount.

equivalent fractions Fractions that name the same amount.

Example: $\frac{1}{2}$ and $\frac{2}{4}$

↙ ↘
equivalent fractions

estimate About how many or about how much.

evaluate To find the value of a mathematical expression.

even number A whole number that is a multiple of 2. The ones digit in an even number is 0, 2, 4, 6, or 8.

expanded form A number written to show the value of each of its digits.

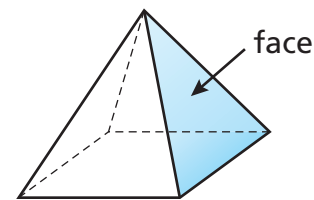
Examples: $347 = 300 + 40 + 7$
 $347 = 3 \text{ hundreds} + 4 \text{ tens} + 7 \text{ ones}$

expression A combination of numbers, variables, and/or operation signs. An expression does not have an equals sign.

Examples: $4 + 7$
 $a - 3$

F

face A flat surface of a solid figure.

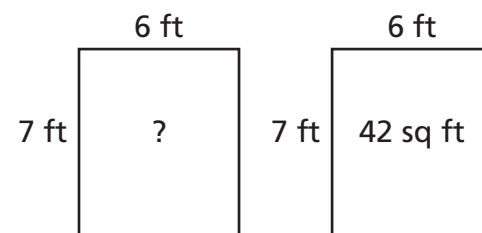


factors Numbers that are multiplied to give a product.

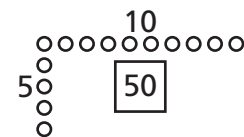
Example: $4 \times 5 = 20$

↙ ↘ ↘
factor factor product

Fast-Area drawing A representation of an area model that students can sketch quickly to label the units appropriately on a rectangle.



Fast-Array drawing A representation of an array that shows a missing factor or missing product.



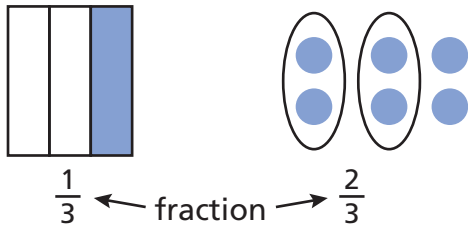
fewer Fewer is used to compare two quantities that can be counted. There are fewer red books than blue books. Less is used to compare two quantities that can be measured. There is less water than juice. See comparison language.

fluid ounce (fl oz) A unit of liquid volume in the customary system that equals $\frac{1}{8}$ cup or 2 tablespoons.

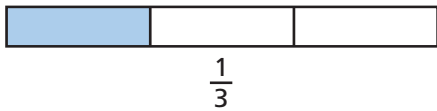
foot (ft) A customary unit used to measure length.
1 foot = 12 inches

formula An equation with variables that describes a rule. The formula for the area of a rectangle is: $A = l \times w$, where A is the area, l is the length, and w is the width.

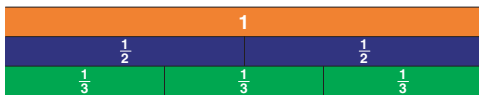
fraction A number that names part of a whole or part of a set.



fraction bar A visual representation of a whole divided into equal parts. The fraction bar shown here represents one third.



fraction strip Strips of paper divided into equal unit fractional parts that students can fold to explore equivalent fractions.



frequency table A table that shows how many times each event, item, or category occurs.

Frequency Table	
Age	Tally
7	1
8	3
9	5
10	4
11	2

function A set of ordered pairs such that no two ordered pairs have the same first member.

function table A table of ordered pairs that shows a function.

For every input number, there is only one possible output number.

Rule: add 2	
Input	Output
1	3
2	4
3	5
4	6

G

gallon (gal) A customary unit used to measure liquid volume (capacity).

1 gallon = 4 quarts = 8 pints = 16 cups

gram (g) A metric unit of mass. One paper clip has a mass of about 1 gram. 1,000 grams = 1 kilogram

greater than (>) A symbol used to compare two numbers.

Example: $6 > 5$

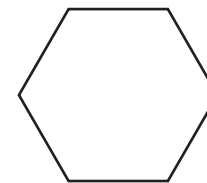
6 is greater than 5

group To combine numbers to form new tens, hundreds, thousands, and so on.

H

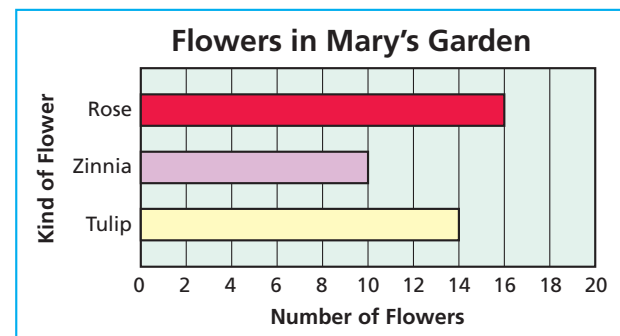
height A vertical distance, or how tall something is.

hexagon A polygon with six sides.

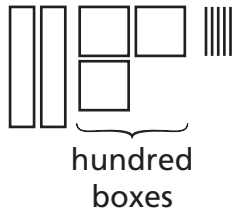


horizontal Extending in two directions, left and right.

horizontal bar graph A bar graph with horizontal bars.



hundred box In a place value drawing, a square box representing that 10 ten sticks equal one hundred. A hundred box is a quick way of drawing 100.



I

Identity Property of Addition If 0 is added to a number, the sum equals that number.
Example: $3 + 0 = 3$

Identity Property of Multiplication The product of 1 and any number equals that number.
Example: $1 \times 10 = 10$

improper fraction A fraction in which the numerator is equal to or is greater than the denominator. Improper fractions are equal to or greater than 1. $\frac{8}{8}$ and $\frac{8}{3}$ are improper fractions.

inch (in.) A customary unit used to measure length.
12 inches = 1 foot

inequality A statement that two expressions are not equal.

input In a function or rule, the value that is entered into the function or rule to produce an output.

inverse operations Opposite or reverse operations that undo each other. Addition and subtraction are inverse operations. Multiplication and division are inverse operations.

K

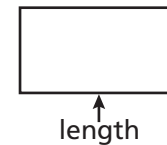
key A part of a map, graph, or chart that explains what symbols mean.

kilogram (kg) A metric unit of mass.
1 kilogram = 1,000 grams

kilometer (km) A metric unit of length.
1 kilometer = 1,000 meters

L

length The measure of a line segment or one side of a figure.



less than (<) A symbol used to compare numbers.

Example: $5 < 6$

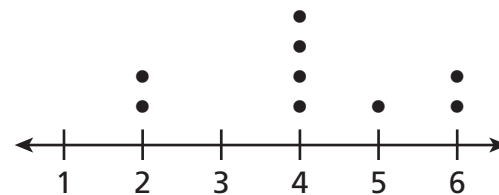
5 is less than 6

line A straight path that goes on forever in opposite directions.



line graph A graph that uses a straight line or a broken line to show changes in data.

line plot A diagram that shows frequency of data on a number line. Also called a *dot plot*.



line segment A part of a line. A line segment has two endpoints.



liquid volume A measure of how much a container can hold. Also called *capacity*.

liter (L) A metric unit used to measure liquid volume (capacity). 1 liter = 1,000 milliliters

M

Make a Hundred Strategy An addition or subtraction strategy in which the student finds the 100-partner of the larger addend and then breaks apart the other addend into that 100-partner and the rest to find the total. To add $80 + 70$ using the Make a Hundred strategy, the student finds the 100-partner for 80 which is 20, breaks apart 70, the other addend, into $20 + 50$ and then adds the rest, 50, to 100. Thus, $100 + 50 = 150$ so $80 + 70 = 150$.

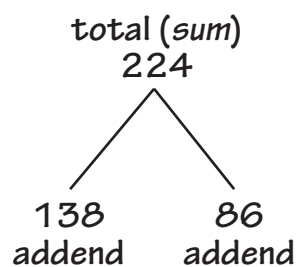
Make a Ten Strategy An addition strategy in which students find the 10-partner. To add $7 + 9$, the student finds the 10-partner for 9 which is 1, breaks apart 7, the other addend, into $1 + 6$ and then adds the rest, 6, to 10. Thus, $10 + 6 = 16$, so $7 + 9 = 16$.

Make a Thousand Strategy An addition strategy in which the student finds the 1,000-partner of the larger addend and then breaks apart the other addend into that 1,000-partner and the rest to find the total.

To add $800 + 700$ using the Make a Thousand strategy, the student finds the 1,000-partner for 800 which is 200, breaks apart 700, the other addend, into $200 + 500$ and then adds the rest, 500, to 1,000. Thus, $1,000 + 500 = 1,500$ so $800 + 700 = 1,500$.

mass The amount of matter in an object. (Mass is constant; weight varies because weight is the effect of gravity on matter.)

Math Mountain A visual representation of the addends and totals of a number. The total (*sum*) appears at the top and the two addends that are added to produce the total are below to the left and right.



mental math A way to solve problems without using pencil and paper or a calculator.

meter (m) A metric unit used to measure length.
1 meter = 100 centimeters

method A procedure, or way, of doing something.

mile (mi) A customary unit of length.
1 mile = 5,280 feet

milliliter (mL) A metric unit used to measure liquid volume (capacity).
1,000 milliliters = 1 liter

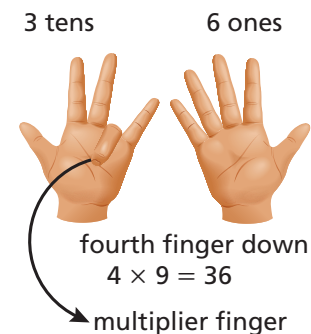
mixed number A whole number and a fraction.
 $1\frac{3}{4}$ is a mixed number.

multiple A number that is the product of the given number and any whole number.

Multiplication Table An array of numbers with rows and columns labeled from 1 through 10. The product of the labels is found in the cell where the row and column intersect.

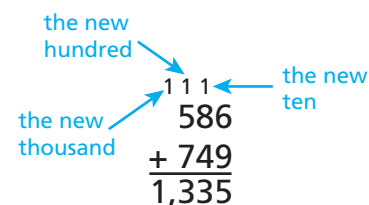
multiplier One of the factors in a multiplication equation. In the 9s count-bys or multiplications, each of the numbers that 9 is multiplied by, is the multiplier.

multiplier finger Used with the multiplication strategy Quick 9s strategy, the bent finger that indicates the number that 9 is being multiplied by.

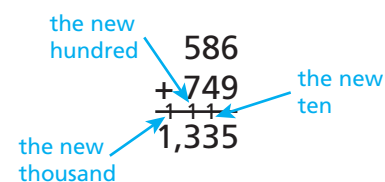


N

New Groups Above Method A strategy for multidigit addition. The new groups are placed above the existing groups. This is the current, common method of addition.



New Groups Below Method A strategy for multidigit addition. The new groups are placed below the existing groups on the line waiting to be added.



non-standard unit A unit of measure not commonly recognized, such as a paper clip. An inch and a centimeter are standard units of measure.

non-unit fraction A fraction that is built from unit fractions. $\frac{2}{3}$ is a non-unit fraction. It is built from the unit fractions $\frac{1}{3} + \frac{1}{3}$.

number line A line on which numbers are assigned to lengths.

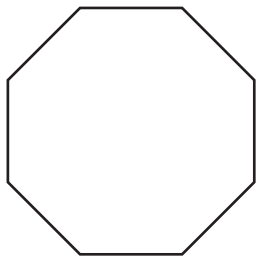
number sentence Numbers and expressions related to each other using one of these symbols: =, <, or >.

numerator The top number in a fraction that shows the number of equal parts counted.
Example: $\frac{1}{3}$ ← numerator.

O

obtuse angle An angle that measures more than 90° but less than 180° .

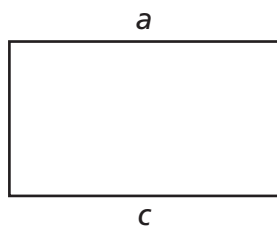
octagon A polygon with 8 sides.



odd number A whole number that is not a multiple of 2. The ones digit in an odd number is 1, 3, 5, 7, or 9.

operation A mathematical process. Addition, subtraction, multiplication, division, and raising a number to a power are operations.

opposite sides Sides in a polygon that are across from each other; they do not meet at a point.
Example: Sides *a* and *c* are opposite.



ordered pair A pair of numbers such as (3, 4) in which one number is considered to be first and the other number second. They can name a point on a coordinate grid.

Order of Operations A set of rules that state the order in which operations in an expression should be done.

- Perform operations inside parentheses first
- Multiply and divide from left to right
- Add and subtract from left to right

ordinal numbers Numbers used to show order or position. For example, first, second, fifth.

ounce (oz) A customary unit used to measure weight. 16 ounces = 1 pound

output In a function table, the value resulting from a specific input and rule.

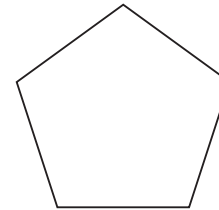
P

parallel The same distance apart everywhere. This can describe lines, line segments, or faces of a solid figure.

parallelogram A quadrilateral with both pairs of opposite sides parallel.



pentagon A polygon with five sides.

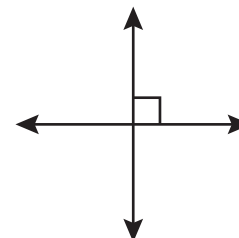


perimeter The distance around the outside of a figure.

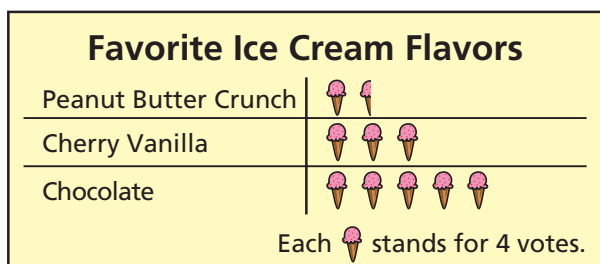
Example:

$$\text{Perimeter} = 3 \text{ cm} + 5 \text{ cm} + 3 \text{ cm} + 5 \text{ cm} = 16 \text{ cm}$$

perpendicular Two lines, line segments, or rays that cross or meet to form right angles.

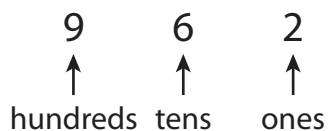


pictograph A graph that uses pictures or symbols to represent data.

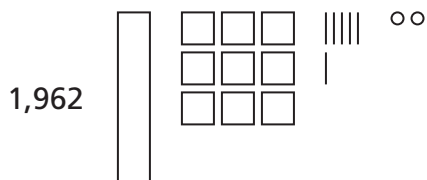


pint (pt) A customary unit used to measure liquid volume (capacity). 1 pint = 2 cups

place value The value assigned to the place that a digit occupies in a number.



place value drawing A drawing that represents a number. Thousands are represented by a bar, hundreds are represented by boxes, tens by vertical lines, and ones by small circles.



P.M. The time period between noon and midnight.

polygon A closed plane figure with sides made up of line segments.

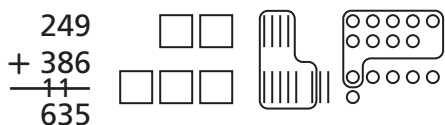
pound (lb) A customary unit used to measure weight. 1 pound = 16 ounces

product The answer when you multiply numbers.

Example: $4 \times 7 = 28$



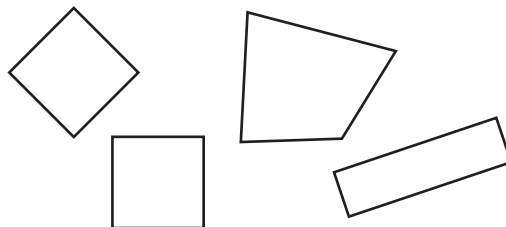
proof drawing A drawing used to show that an answer is correct.



put together problem A problem that involves putting together (combining, joining) groups of things to form a total.

Q

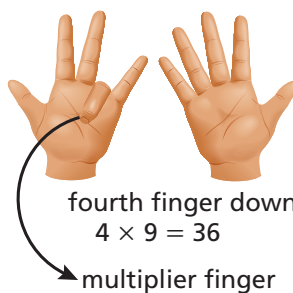
quadrilateral A polygon with four sides.



quart (qt) A customary unit used to measure liquid volume (capacity). 1 quart = 4 cups

Quick 9s A short-cut for multiplying by 9 in which students bend down one finger to represent the multiplier. The remaining fingers to the left of the bent finger represent the tens digit of the product and the fingers to the right of the bent finger represent the ones digit of the product.

3 tens 6 ones



This method works because
 $4 \times 9 = 4 \times (10 - 1) = 40 - 4 = 36$

quotient The answer when you divide numbers.

Examples:

$35 \div 7 = 5$

↑
quotient

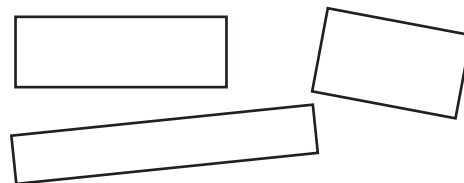
$7 \overline{)35}$ ← quotient

R

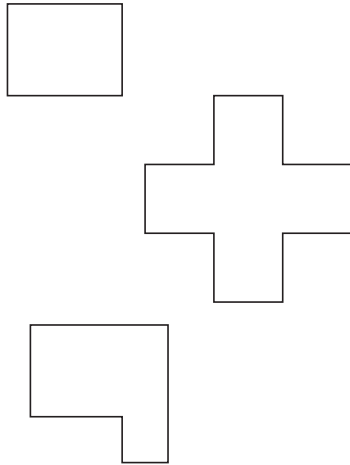
ray A part of a line that has one endpoint and goes on forever in one direction.



rectangle A parallelogram that has 4 right angles.



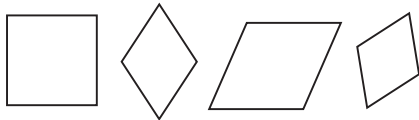
rectilinear polygon A polygon in which all edges meet at right angles.



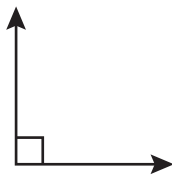
remainder In division, the quantity that is left over which is not large enough to make another whole group. In the division example, 32 divided by 6, the quotient is 5 with a remainder of 2. There are 5 groups of 6 and one more group that has only 2 items (the remainder).

repeated addition An introduction to multiplication in which one adds the same number (3) several times (4) to show that $3 + 3 + 3 + 3$ produces the same result as 4×3 .

rhombus A parallelogram with equal sides.

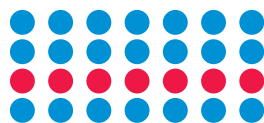


right angle An angle that measures 90° .



round To find about how many or how much by expressing a number to the nearest ten, hundred, thousand, and so on.

row A part of a table or array that contains items arranged horizontally.



rule In a pattern such as a function table or number sequence, what is done to the first number to get to the second number and so on. The rule *Add 3* is shown in the function table.

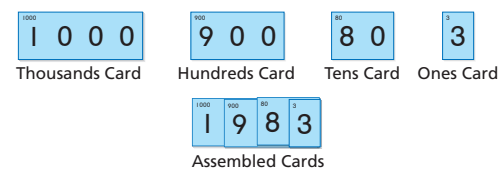
Add 3.	
0	3
1	4
2	5
3	6

The rule $n + 7$ is shown in the number sequence: 2, 9, 16, 23

S

scale An arrangement of numbers in order with equal intervals.

Secret Code Cards Cards printed with the digits 0 through 9, multiples of 10 from 10 through 90 and multiples of 100 from 100 through 1,000. The number is represented on the back of the card by dots, sticks, or boxes. The cards are used to teach place value.



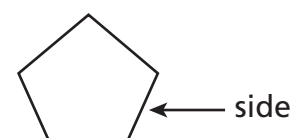
set A group of numbers or other things.

Show All Totals Method A method for finding a total of multidigit numbers.

$$\begin{array}{r}
 586 \\
 + 749 \\
 \hline
 1,200 \\
 + 120 \\
 \hline
 1,320 \\
 + 15 \\
 \hline
 1,335
 \end{array}$$

the new thousand →
the new hundred →
the new ten →

side (of a figure) One of the line segments that make up a polygon.



T

simplify To write an equivalent fraction with a smaller numerator and denominator.

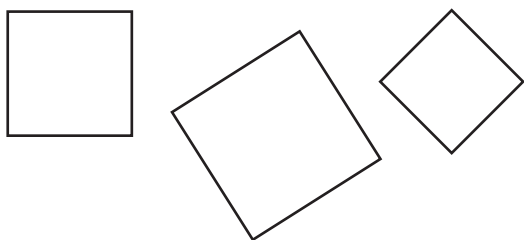
situation equation An equation that shows the action or the relationship in a problem.

Example: $35 + n = 40$

solution equation An equation that shows the operation to perform in order to solve the problem.

Example: $n = 40 - 35$

square A rectangle with four sides of the same length.



square number The product of a whole number and itself.

Example: $4 \times 4 = 16$



square unit A unit of area equal to the area of a square with one-unit sides.

standard form The name of a number written using digits.

Examples: 1, 829

standard unit A recognized unit of measure, such as an inch or centimeter.

Strategy Cards Cards that display a multiplication or division exercise on one side. The other side shows the answer to the exercise, the count-bys (up to the product) for both factors, and a Fast-Array drawing that shows the product and the two factors.

sum The answer when adding two or more addends.

Example: $37 + 52 = 89$



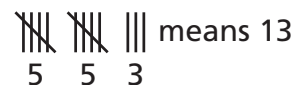
survey A method of collecting information.

table An easy-to-read arrangement of data, organized in rows and columns.

Favorite Team Sport	
Sport	Number of Students
Baseball	35
Soccer	60
Basketball	40

take apart problem A problem that involves separating a group of objects.

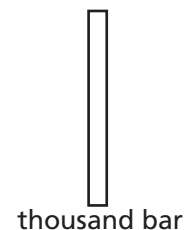
tally marks Short line segments drawn in groups of 5. Each mark, including the slanted mark, stands for 1 unit.



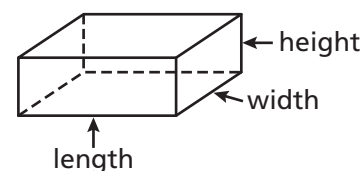
ten stick In a place value drawing a vertical line used to represent 10.



thousand bar In a place value drawing, a bar used to represent 1,000. A thousand bar is a quick way of drawing 1,000.



three-dimensional figure A figure with three dimensions.

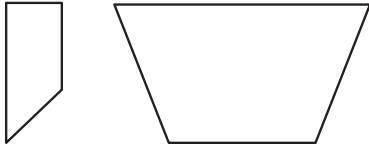


total The answer when adding two or more addends. The sum of two or more numbers.

Example: $672 + 228 = 900$

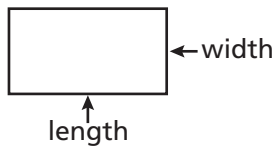


trapezoid A quadrilateral with exactly one pair of parallel sides.



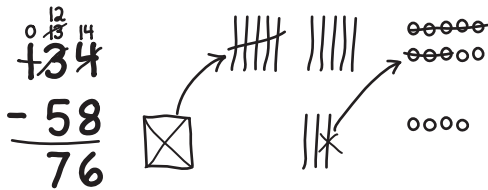
triangle A polygon with three sides.

two-dimensional figure A figure with two dimensions.



U

ungroup To open up 1 in a given place to make 10 of the next smaller place value in order to subtract.



unit fraction A fraction whose numerator is 1. It shows one equal part of a whole.



unit square A square whose area is 1 square unit.

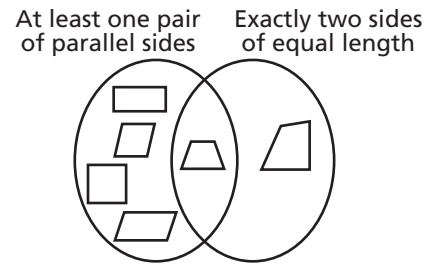
V

variable A letter or symbol used to represent an unknown number in an algebraic expression or equation.

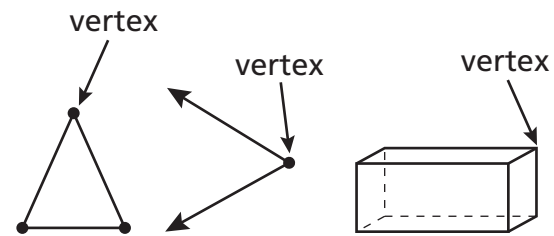
Example: $2 + n$

n is a variable.

Venn diagram A diagram that uses circles to show the relationship among sets of objects.



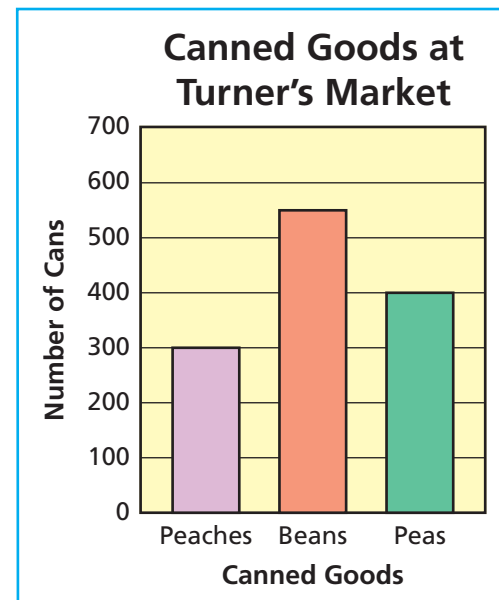
vertex A point where sides, rays, or edges meet.



vertical Extending in two directions, up and down.



vertical bar graph A bar graph with vertical bars.

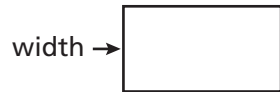


volume The measure of the amount of space occupied by an object.

W

weight The measure of how heavy something is. (Weight varies because weight is the effect of gravity on matter; mass is constant.)

width The measure of one side of a figure.



word form A name of a number written using words instead of digits.

Example: nine hundred eighty four

Y

yard (yd) A customary unit used to measure length.
1 yard = 3 feet = 36 inches

Z

Zero Property of Multiplication If 0 is multiplied by a number, the product is 0.

Example: $3 \times 0 = 0$