

# Learning a New Language



Introduce students to the idea of seeing math as a language that's important to learn.

**Objective:** Students will be able to use a model to explore the meaning of an unknown math vocabulary term or symbol.

**Grades:** 5–8

**Time:** 45 minutes

**Materials:** math word problem that introduces a new concept, two copies of the graphic organizer, math text that introduces a new concept, chart paper and markers for each small group

**Optional Materials:** copy of the math terms for your grade level (provided)

## DIRECTIONS

### Bell-Ringer Activity

Write the following prompt on the board and have students respond to it. *How would a visit to another country be different if you knew the language spoken there? How would knowing the language impact daily tasks, such as ordering food or taking a bus?*

### Whole-Group Instruction

- Project on the board a word problem that includes at least one math vocabulary term or symbol that is new to your students. (See the sample problem; also see the grades 5–8 math vocabulary lists in this lesson.)
- Read the problem aloud with students and ask them to identify any unfamiliar words or symbols. Circle them. Then ask each student to turn to a partner and share why it might be important to know the meanings of the circled items.
- Provide time for students to share information from their discussions. Point out that math, like a foreign language, is a language all its own. Knowing the meanings of math terms and symbols can help a student grasp new concepts and solve problems with greater understanding and ease.
- Display a copy of the “Take a Closer Look” graphic organizer, which is an adaptation of the popular Frayer model for building student vocabulary. Write a math term that students are already familiar with in the center of the diagram where indicated. Then explain to students what each of the four labels on the

### Sample Problem

Julie saved \$232.65, which is 25 percent of the amount she needs to save so she can pay for her vacation trip. How much does Julie need to save?

diagrams means:

- a. Definition: Write a definition of the concept in your own words.
  - b. Characteristics: List facts or characteristics about the term.
  - c. Examples: List or draw pictures of examples of the term.
  - d. Non-examples: List or draw pictures of related things that are not examples.
5. Think aloud as you begin to fill out the organizer in the order listed above. Have students add their own suggestions as well until you have completed the organizer.
  6. Discuss as a class how completing the organizer helped students get a clearer, more in-depth understanding of the term.
3. Divide students into an even number of small groups. Give each group a large sheet of chart paper and a marker. Direct the group to select one student as the spokesperson.
  4. Direct each group to copy the graphic organizer on the chart paper and then work together to complete it for the term introduced in Step 2.
  5. Post each group's chart, and then have each spokesperson share it with the class. Have students decide as a class on the best responses for each section. Write those responses on the projected copy of the organizer, pointing out how much more students know about the term than when it was introduced in Step 2.

### Small-Group and Whole-Group Practice

1. As students follow along, read aloud a short text selection that introduces a new math concept. **To vary the activity for older students**, have them read the text selection silently on their own.
2. Project a blank copy of the graphic organizer and write the new term/concept in the center section.

### Progress Check

Wrap up the lesson by reminding students all that they have learned about the importance of seeing math as having its own language and of taking a close look at unfamiliar math terms and symbols.

Direct each student to complete an exit ticket on a piece of paper or a sticky note by finishing this sentence: It is important to study the meanings of unfamiliar math terms because \_\_\_\_\_.

## Speaking the language of math

Our popular course **The Language of Math** teaches students to “translate” mathematical symbols and terms into words they understand, building a strong foundation for math success. The course also shows how to help students approach word problems and use rich problem-solving tasks to deepen understanding.

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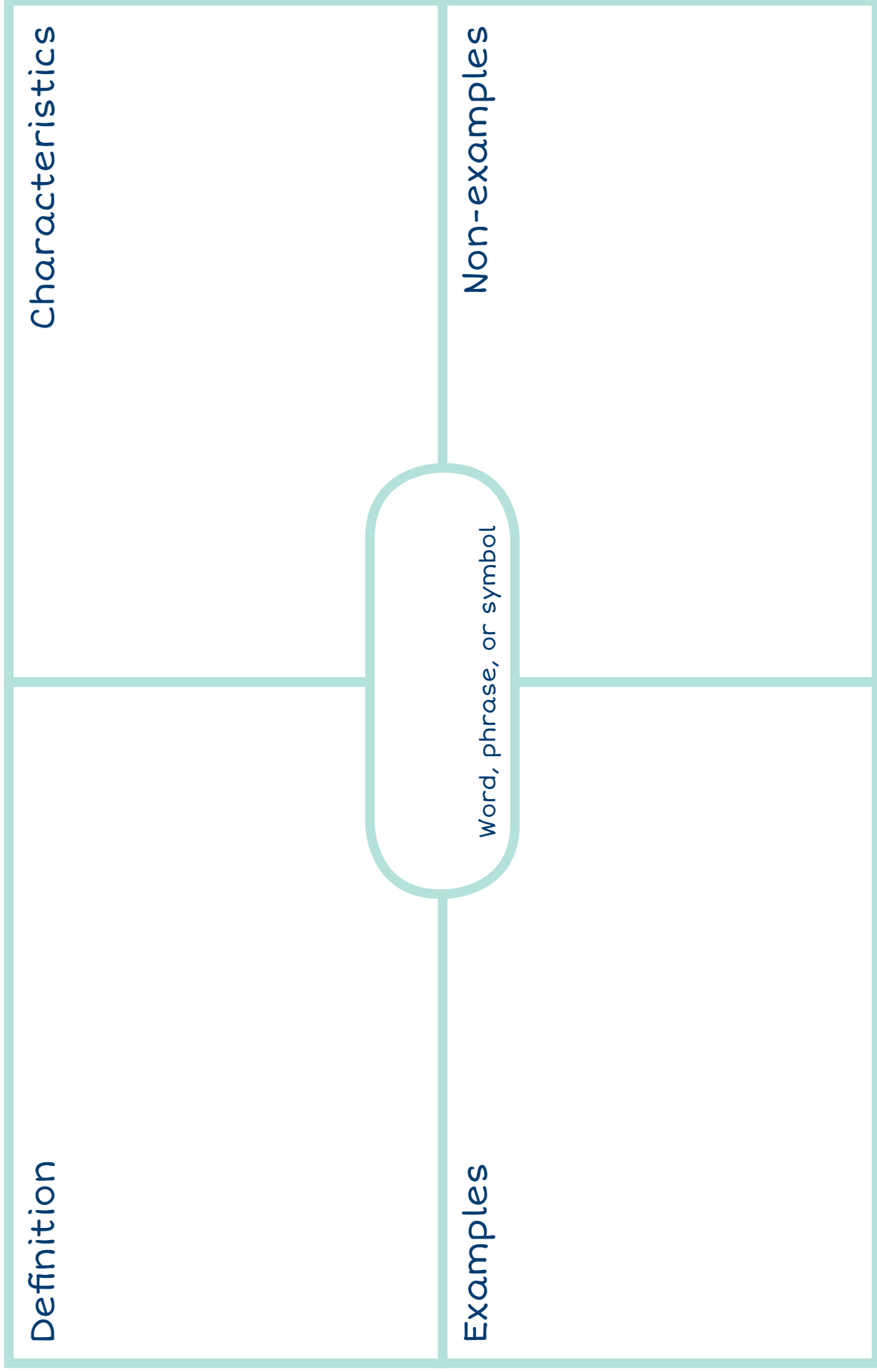
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## MY NOTES

# Take a Closer Look



# Math Vocabulary List—Grade 5

The list below includes words your students are likely to encounter in the math curriculum you teach. Add any additional terms on the provided lines.

acute triangle	decompose	line symmetry	quadrilateral
addend	dekameter	liter	quart
Additive Property of 0	denominator	long division	quotient
algorithm	diagonal	lowest terms	reasonableness
area	difference	mass	rectangle
area model	Distributive Property	meter	regular polygon
array	dividend	metric system	remainder
Associative Property of Addition	divisible	mile	rhombus
Associative Property of Multiplication	divisor	milligram	right rectangular prism
attribute	elapsed time	milliliter	right triangle
axis (axes)	equation	millimeter	rounding
bar graph	equiangular triangle	minuend	scale
bar model	equivalent fractions	mixed number	scalene triangle
base of an exponent	estimate	multiple	scaling
base of a solid figure	evaluate	Multiplicative Identity	sequence
base-ten numeral	expanded form	Property of 1	simplify
base-ten numerals	exponent	multiply	simplest form
benchmark	expression	nonagon	solid figure
benchmark fractions	factor	number line	square
braces	fluid ounce	numerator	square unit
brackets	foot	numerical expression	standard form
capacity	formula	obtuse triangle	subtrahend
centimeter	fraction	octagon	sum
common denominator	fraction bar	octagonal prism	tenth
common factor	fraction greater than one	Order of Operations	tenths
common multiple	fraction less than one	ordered pair	term
Commutative Property of Addition	gallon	origin	thousandth
Commutative Property of Multiplication	gram	ounce	thousandths
compatible numbers	greater than	parallel lines	three-dimensional figure
compose	height	parallelogram	tiling
congruent	heptagon	parentheses	ton
coordinate grid	hexagon	partial product	trapezoid
coordinate plane	hexagonal prism	partial quotient	two-dimensional figure
coordinate system	hierarchy	pattern	unit cube
coordinates	hundredth	pentagon	unit fraction
corresponding terms	hundredths	pentagonal prism	unlike denominators
cube	inch	pentagonal pyramid	variable
cubic unit	inequality	period	vertex (vertices)
cup	intersect	perpendicular	volume
customary system	interval	perpendicular lines	weight
data	inverse operations	pint	whole numbers
decagon	isosceles triangle	place value	x-axis
decagonal prism	kilogram	plane	x-coordinate
decimal	kilometer	polygon	yard
decimal fraction	lateral face	polyhedron	y-axis
decimal point	length	pound	y-coordinate
decimeter	less than	powers of ten	
	like denominators	prime number	
	line graph	prism	
	line of symmetry	product	
	line plot	pyramid	
		quadrant	

**Additional terms:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Math Vocabulary List—Grade 6

The list below includes words your students are likely to encounter in the math curriculum you teach. Add any additional terms on the provided lines.

absolute value	difference	line of symmetry	quart
acute triangle	distribution	line plot	quotient
addend	Distributive Property	line symmetry	range
Addition Property of Equality	dividend	linear equation	rate
Additive Identity	divisible	liter	ratio
Property of 0	Division Property of Equality	lower extreme	rational number
additive inverse	divisor	lower quartile	reciprocal
algebraic expression	dot plot	magnitude	rectangle
algorithm	double number line diagram	mass	regular polygon
altitude	edge	maximum	relative frequency table
area	equation	mean	repeating decimal
array	equiangular triangle	mean absolute deviation	right rectangular prism
Associative Property of Addition	equilateral triangle	measure of center	right triangle
Associative Property of Multiplication	equivalent	measure of variability	scalene triangle
attribute	equivalent expressions	median	signed number
axis (axes)	equivalent fractions	meter	simplest form
bar graph	equivalent ratios	metric system	simplify
bar model	evaluate	minimum	solid figure
base of a polygon	exponent	minuend	solution of an equation
base of a solid figure	expression	mixed number	solution of an inequality
base of an exponent	face	mode	spread
benchmark	factor	multiple	square
box plot	first quartile	Multiplication Property of Equality	statistical question
capacity	formula	Multiplicative Identity	statistical variability
cluster	fraction	Property of 1	statistics
coefficient	fraction bar	multiplicative inverse	substitution
common denominator	fraction greater than one	negative numbers	Subtraction Property of Equality
common factor	fraction less than one	net	subtrahend
common multiple	frequency table	number line	sum
Commutative Property of Addition	gallon	numerator	surface area
Commutative Property of Multiplication	gap	numerical expression	table
compatible numbers	gram	obtuse triangle	tape diagram
compose	greater than	opposites	term
composite figure	greater than or equal to	Order of Operations	terminating decimal
congruent	greatest common factor (GCF)	ordered pair	third quartile
constant	height	origin	three-dimensional figure
constant speed	histogram	ounce	ton
conversion factor	independent variable	outlier	trapezoid
coordinate grid	inequality	parallelogram	two-dimensional figure
coordinate pair	infinite	pattern	unit cube
coordinate plane	integers	percent	unit fraction
coordinate system	interquartile range	pint	unit rate
coordinates	interval	plot	unit square
cube	inverse operations	polygon	upper extreme
cubic unit	is not equal to	polyhedron	upper quartile
customary system	isosceles triangle	positive numbers	value
data	lateral area	pound	variable
decimal	lateral face	prime factorization	vertex (vertices)
decimal fraction	least common multiple	prime number	volume
decompose	length	prism	weight
denominator	less than	product	whole numbers
dependent variable	less than or equal to	proportion	x-axis
diagonal	like terms	pyramid	x-coordinate
		quadrants	y-axis
		quadrilateral	y-coordinate
		quantity	

**Additional terms:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

# Math Vocabulary List—Grade 7

The list below includes words your students are likely to encounter in the math curriculum you teach. Add any additional terms on the provided lines.

absolute value	likely event	right rectangular pyramid
acute triangle	long division	right triangle
additive inverse	markdown	sample space
adjacent angle	markup	scale
area	mean absolute deviation	scale drawing
area (circle)	measure of center	scalene triangle
area (quadrilateral)	measure of variation	signed number
area (regular polygon)	nonzero divisor	simple interest
area (triangle)	number line	simulation
axis (axes)	obtuse triangle	solution set
circumference	ordered pair	spread
coefficient	origin	statistical variability
commission	percent	statistics
complementary angle	percent decrease	substitution
compound events	percent error	supplementary angle
coordinate	percent increase	surface area
coordinate plane	plane section	surface area (cube)
coordinate system	polygon	surface area (right prism)
cube	polyhedron	tax
data	population	terminating decimal
degree of visual overlap	prediction	tree diagram
diagram	prism	triangle
Distributive Property	probability	unit rate (constant of proportionality)
equation	proportion	unlikely event
equilateral triangle	proportional relationship	variable
estimate	protractor	vertical angle
evaluate	pyramid	volume
event	quadrant	volume (cube)
expression	quadrilateral	volume (right prism)
factor	quotient	x-axis
frequency	random sample	x-coordinate
geometric figure	rate	y-axis
graph	ratio	y-coordinate
gratuity	rational coefficient	
inequality	rational number	
inference	relative frequency	
integer	repeating decimal	
isosceles triangle	right prism	
	right rectangular prism	

**Additional terms:** \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



# Math Vocabulary List—Grade 8

The list below includes words your students are likely to encounter in the math curriculum you teach. Add any additional terms on the provided lines.

AA Similarity Postulate	infinitely many solutions	reflection
alternate exterior angles	input	relative frequency table
alternate interior angles	integer	repeating decimal
angle	integer exponents	rotation
Angle Sum Theorem	intercept	scale factor
apothem	irrational numbers	scatter plot
axis	line	scientific notation
bivariate data	line of best fit	sequence
cluster (scatter plot)	line segment	similar figure
coefficient	linear equation	similar triangles
collecting like terms	linear function	slope
congruent	linear relationship	slope formula
Consecutive Interior Angles	negative association	slope intercept form
constant rate of exchange	no solution	solution
converse	nonlinear association	square root
coordinate plane	nonlinear function	table of values
coordinate system	nonvertical line	terminating decimal
coordinates	number line	transformation
cube root	ordered pair	translation
decimal	origin	transversal
decimal expansion	outlier (scatter plot)	truncate
decreasing function	output	two-dimensional figure
dilation	parallel lines	two-way frequency table
Distributive Property	perfect square	unit rate
equation	positive association	variable
estimate	power of ten	vertical axis
expression	proof	vertical intercept
Exterior Angle Theorem	proportional	volume of cone
fraction	relationships	volume of cylinder
frequency	Pythagorean Theorem	volume of sphere
function	Pythagorean Theorem Converse	x-axis
graph	qualitative	x-coordinate
increasing function	radical	x-intercept
inferences	rate of change	y-axis
	rational number	y-coordinate
		y-intercept

**Additional terms:** \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_