

10 Ways to Practice Mathematics Vocabulary

It is imperative to emphasize mathematics vocabulary in the classroom. What follows are ideas with examples about how to practice mathematics vocabulary.

1. Teach vocabulary explicitly.
2. Use graphic organizers, like Frayer models.
3. Create math vocabulary cards.
4. Create vocabulary glossaries.
5. Create word walls.
6. Do crosswords or seek-and-finds.
7. Play memory with vocabulary terms and definitions.
8. Create an oral vocabulary routine.
9. Incorporate mathematics writing.
10. Play the Hot Seat game.



1. Teach vocabulary explicitly

Before teaching new mathematics content, it may be necessary to explicitly teach new vocabulary. The teaching of vocabulary should include: (a) an introduction of the term, (b) a student-friendly definition, and (c) a connection to a mathematics concept or procedure. As students practice mathematics content, review vocabulary often.

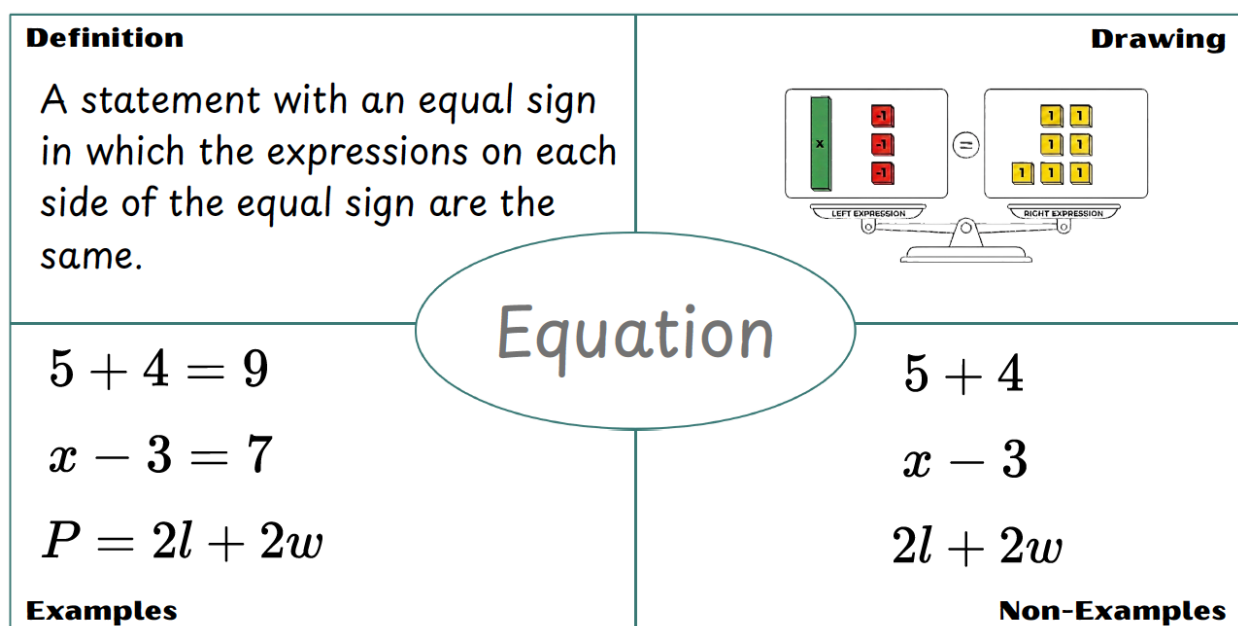
Here is an example of the explicit teaching of mathematics vocabulary.

Teacher:	Let's find fractions that are equivalent to the fraction one-fourth. <i>Equivalent fractions</i> are fractions with different denominators that have the same value. What are <i>equivalent fractions</i> ?
Students:	Fractions with different denominators that have the same value.
Teacher:	That's right. <i>Equivalent fractions</i> have different denominators with the same, or equal value. Let's generate fractions that are equivalent, or equal to one-fourth. Let's use our fraction tiles!
Teacher:	To find equivalent fractions, we always want to display the 1 whole at the bottom of our workspace. We can use the 1 whole to compare lengths of our fractions (<i>display fraction tile that shows 1 whole</i>). Remind me, we are generating fractions equivalent to which fraction?
Student:	One-fourth.
Teacher:	Nice work! Let's go ahead and place the fraction tile that shows 1, one-fourth tile above the 1 whole on your workspace.
Students:	(<i>Display the fraction tile that shows 1, one-fourth tile above the 1 whole on their workspace</i>).
Teacher:	Great job! Now to find equivalent fractions, we need to make sure to use fraction tiles with different denominators that line up perfectly above the 1, one-fourth tile. Why is this step important?
Students:	We want the tiles to line up perfectly because this shows us that the fractions are equal in length, or equally long.
Teacher:	Good thinking! When fractions line up equally in length, we can say they are equivalent fractions. What makes fractions equivalent?
Student:	They are equal in length, or equally long.

2. Use graphic organizers, like Frayer models

For vocabulary terms that students will use often or for terms that are difficult for students, use a graphic organizer to explore the properties of a term. One example of a graphic organizer is the Frayer model. With the Frayer model, the term is written in the middle of the organizer, and then students write a student-friendly definition, draw the term, list examples, and list non-examples. Students should develop their own Frayer models instead of looking at already-prepared models.

Here is an example of the Frayer model for the term *equation*.



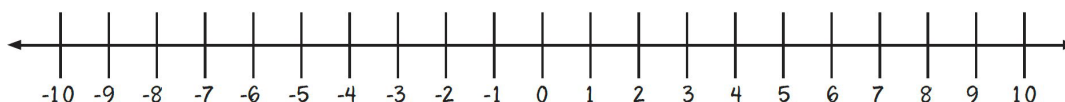
3. Create math vocabulary cards

For vocabulary terms that students will use often or for terms that are difficult for students, ask students to create their own set of vocabulary cards. Vocabulary cards should feature (a) the term, (b) a student-friendly definition, and (c) a visual that represents the term.

Here are examples of vocabulary cards from the [Inclusion in Texas Math Modules](#).

absolute value

The distance of a number from zero on a number line.



integer

A positive or negative whole number.

-3 -2 -1 1 2 3

zero pair

A pair of numbers with a sum of zero.

$$\textcolor{blue}{-7} + \textcolor{green}{7} = 0$$

4. Create vocabulary glossaries

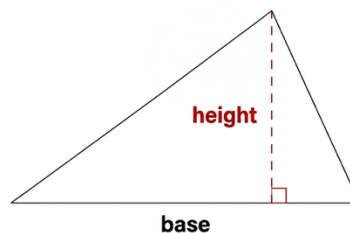
Ask students to create their own mathematics vocabulary glossary. One idea is to create a notebook with one letter (A through Z) on each page. When students learn new vocabulary, they can add terms, definitions, and examples to their glossary.

Here is an example of the H page of a glossary.

H

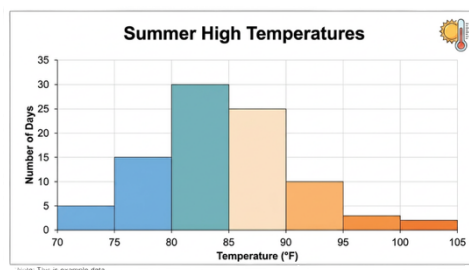
height

The distance from the base to the top of an object or shape.



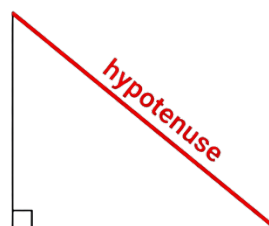
histogram

A graph that organizes information into ranges to visualize the frequency distributions.



hypotenuse

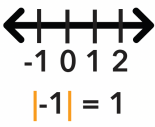
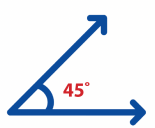
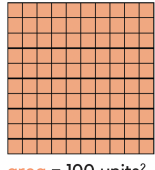
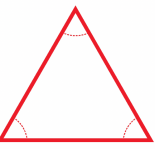
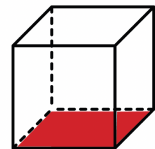
The longest side of a right triangle, opposite of the right angle.



5. Create word walls

For vocabulary terms that students will use often or for terms that are difficult for students, create a word wall to hang on the classroom wall. There are word walls available for purchase, but a better idea is to create a word wall with the students. Each card on a word wall should feature (a) the term, (b) a student-friendly definition, and (c) a visual that represents the term. Make sure to explicitly teach and review each term with students before placing the term on the word wall. We recommend making the word wall interactive by having students take cards on and off of the word wall as they review important math content.

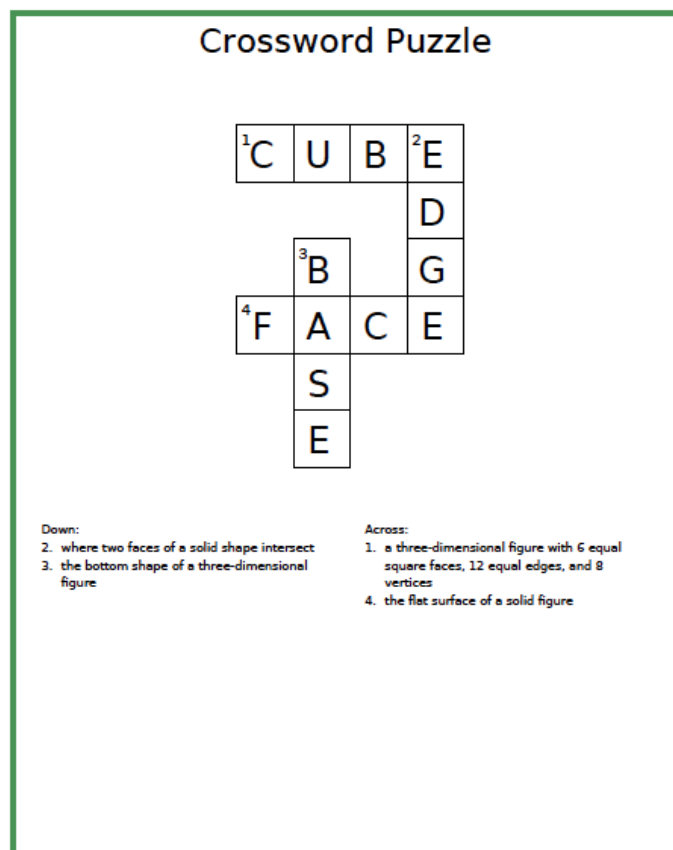
Here are some example word wall cards.

 A number line with arrows at both ends. It has tick marks labeled -1, 0, 1, and 2. A vertical line segment connects the -1 tick mark to the 0 tick mark, and is labeled $-1 = 1$.	absolute value The distance of a number from zero.	 Two adjacent angles sharing a common vertex and a common ray. The angles are formed by two other rays extending in opposite directions from the common vertex.	adjacent angles Pairs of angles that share a common vertex and a common ray.
 An acute angle formed by two rays sharing a common vertex. The angle is labeled 45°.	acute angle An angle that measures less than 90° .	 A 10x10 grid of small squares. Below the grid, it says $\text{area} = 100 \text{ units}^2$.	area The number of square units that covers a closed figure.
 A triangle with all three interior angles marked with arcs, indicating they are all acute.	acute triangle A triangle where all 3 interior angles are each less than 90° .	 A 3D cube with its bottom face shaded in red.	base The bottom shape of a three-dimensional figure.
$3 + (-3) = 0$	additive inverse When you add a number to create a sum of 0.	4^2	base A number that is multiplied by an exponent.

6. Do crosswords or seek-and-finds

Create crossword puzzles or seek-and-finds for students to practice mathematics vocabulary.

Here are some examples.



7. Play memory with vocabulary terms and definitions

For vocabulary terms that need to be used with precision, develop a memory game for students to match the term with its definition.

Here is an example of memory for 6 terms related to linear relationships.

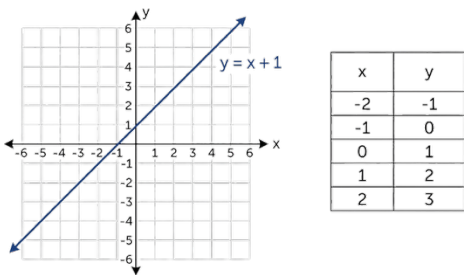
function	dependent variable	input
output	linear relationship	independent variable
a relationship between two quantities in which every input corresponds to exactly one output	a value that changes based on another value	The x of an equation; the information put in to find the output
The y of an equation; the information gained after the input is plugged in the equation	the association between two variables that forms a straight line when graphed	a value that you choose or control

8. Create an oral vocabulary routine

Display an image that can be described using a list of vocabulary terms and provide a word bank. Explicitly model describing the image using some of the terms. Give your students a turn. Have them share out or work with a partner.

Here are some examples with linear relationships.

Image	Word Bank
$3x + 2 = 8$	Coefficient Constant Equation Expression Variable
Students might say...	
<i>In this equation, the coefficient is 3 because it is the number multiplied by the variable.</i>	
<i>In this equation, the expression $3x + 2$ is equivalent to the expression 8.</i>	
<i>In this equation, 2 and 8 are constants because they are fixed values.</i>	

Image	Word Bank												
 The image shows a coordinate plane with x and y axes ranging from -6 to 6. A blue line is graphed with the equation $y = x + 1$. To the right of the graph is a table of ordered pairs: <table><thead><tr><th>x</th><th>y</th></tr></thead><tbody><tr><td>-2</td><td>-1</td></tr><tr><td>-1</td><td>0</td></tr><tr><td>0</td><td>1</td></tr><tr><td>1</td><td>2</td></tr><tr><td>2</td><td>3</td></tr></tbody></table>	x	y	-2	-1	-1	0	0	1	1	2	2	3	Coordinate plane Input Ordered pair Origin Output x-axis x-coordinate y-axis y-coordinate
x	y												
-2	-1												
-1	0												
0	1												
1	2												
2	3												
Students might say...													
<i>The ordered pair $(-1, 0)$ is on the x-axis, and the ordered pair $(0, 1)$ is on the y-axis.</i>													
<i>The origin on a coordinate plane has an x-coordinate of 0 and a y-coordinate of 0.</i>													
<i>The ordered pair $(2, 3)$ has an input of 2 and an output of 3.</i>													

9. Incorporate mathematics writing

Any topic in mathematics can be written about, and mathematics writing helps students explore their mathematical ideas and vocabulary. Provide sentence stems and word banks to support students' use of formal vocabulary. When students write about a topic in mathematics for the first time, make sure to model an example first. Highlight strong examples of students' writing to encourage students' best work.

Here is an example of a sentence stem and word bank with a student's mathematics writing sample.

Explain why the inequality below is incorrect. Use the words from the word bank to explain your reasoning.

$$|-5| < |3|$$

Word bank: absolute value, expression, greater than, inequality

This inequality is incorrect because the expression on the left side is greater than the expression on the right side. The absolute value of -5 is 5 because 5 has a distance of 5 units from 0 on the number line. Similarly, the absolute value of 3 is 3 because 3 has a distance of 3 units from 0 on the number line. Because $5 > 3$, the correct inequality should be $|-5| > |3|$.

10. Play the Hot Seat game

This whole-group game is similar to Taboo. Place a chair in front of the class. Students take turns being in the "hot seat." Display a mathematics vocabulary term behind the student in the hot seat so that the rest of the class can read it. The student in the hot seat will call on students when they raise their hands. Students take turns describing the term until the student in the hot seat guesses the term correctly! Provide a word bank to support.

improper
fraction

It is a type of
fraction.

Five-thirds!

The numerator
is greater than
or equal to the
denominator.