



ELEMENTARY MATHEMATICS VOCABULARY

Home Guide for Vocabulary Lists and Activities

Abstract

The purpose of this toolkit is to identify key mathematical terminology coupled with activities that explore these terms. These activities can be used as a resource for parents or guardians to build mathematical vocabulary at home or as classroom vocabulary building activities.

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Introduction

Mathematical terminology can often seem intimidating to both students and caregivers. Often it can feel like one is learning a new language. Luckily, there are multiple resources available to help students and caregivers better understand unfamiliar mathematical terminology and concepts. The purpose of this Toolkit is to identify key mathematical terminology and highlight some activities that you could do with your students and provide as a resource for at home activities to help build mathematical vocabulary. Each section highlights key words and provides a definition. After the definitions, several activities that can be used in the classroom and at home.

Grades PK-1 (Ages 5-7) Vocabulary

Below is a list of vocabulary words and definitions for grades PK-1.

| Word | Definition |
|-------------------------|--|
| Addend | The value being added in an addition problem. |
| Addition | A mathematical operation that combines the sizes of two values. This is represented by the symbol + (e.g. $3 + 5$ is a quantity of 3 combined with a quantity of 5 to have a quantity of 8). |
| Add/plus/increase | Carrying out the operation of addition. |
| Circle | A rounded shape where the edge is always the same distance from the center. |
| Difference | The result of a subtraction operation. |
| Equal | A comparison of the size of two values where the size of the first value is the same as the size of the second value. This is represented by the symbol = (e.g. $3 = 3$). |
| Fact Family | A relationship between 3 values across two different but related operations (e.g. $2 + 3 = 5$ and $5 - 3 = 2$ is a fact family because the values 2, 3, and 5 are related similarly in addition and subtraction). |
| Greater than | A comparison of the size of two values where the size of the first value is higher than the size of the second value. This is represented by the symbol > (e.g. $5 > 3$). |
| Hexagon | A 6-sided shape. |
| Less than | A comparison of the size of two values where the size of the first value is lower than the size of the second value. This is represented by the symbol < (e.g. $3 < 5$). |
| Pentagon | A 5-sided shape. |
| Rectangle | A 4-sided shape with all angles the same measure. |
| Square | A 4-sided shape with all sides the same length and all angles the same measure (right angles). |
| Subtract/minus/decrease | Carrying out the operation of subtraction. |
| Subtraction | A mathematical operation that reduces the size of the first value by the size of the second value. This is represented by the symbol – (e.g. $5 - 3$ is a quantity of 5 reduced by a quantity of 3 to have a quantity of 2). |
| Sum | The result of an addition operation. |
| Triangle | A 3-sided shape. |

Grades PK-1 (Ages 5-7) Activities

Children in this age range are beginning to learn names for different shapes. This is a great time to build good, strong definitions of geometric shapes. Children are also learning about different aspects of numbers such as how they represent quantity.

Activity 1: Labeling

An easy way to help children in this age group is to label items around the house that correspond to these shapes. This helps build the students' reading concepts but also associates the word with that particular item. It can also serve as a reminder to a parent or guardian to talk about what that word means when you interact with that item. For example, you might have a label on a can as a cylinder or label a round rug as a circle. This could also prompt conversation such as, the can is round like the rug, why do they have different labels? The labels would not need to be permanent, just having sticky notes that can be used to stick to the item can help create a concrete connection for the child.

Activity 2: Higher or Lower Game

Children are often developing ideas of quantity in this age group. Older students in this age group will also be developing ideas of probability. The Higher or Lower Game simply has students guess if the next card to come out will be higher or lower than the previous card. This can be done with any deck of cards (for younger students, it might help to remove face cards such as jacks, queens, kings, and aces). Have the child guess if the next card is higher or lower, draw the next card and discuss if their guess was correct or not. You can help promote thoughts on probability as well by asking the child to think about why they have a better chance for one answer than the other. This can also be played virtually using sites such as <https://www.mathsisfun.com/games/higher-or-lower.html>.

Activity 3: Reading a Book

There are several books available that are very specific about building vocabulary for this age group. *The Everyday House* by Cynthia Rylant is a great example of a book that can build vocabulary for shapes.

Activity 4: Playing a Game

In early grades such as 1st grade, students are developing their concepts of addition and subtraction. There are several games that can be played with students that review these concepts. Clumsy Thief is a great game that helps students practice basic addition skills. For younger students, Clumsy Thief Jr. only works with addition skills for numbers 1-10. Players work to make combinations of numbers that add up to a specific value (10 for the junior version and 100 for the original version). This could be created easily at home as well using some card stock and writing in pairs of values that add up to a specific number. This is a great way to help your child recognize and work with addition and subtraction fact families.

Grades 2-3 (Ages 7-9) Vocabulary

Below is a list of vocabulary words and definitions for grades 2-3.

| Word | Definition |
|-------------------|---|
| 2-Dimensional | A figure that can be completely represented on a flat surface using length and width dimensions. Examples include shapes such as squares, circles, triangles, rectangles, etc.). |
| 3-Dimensional | A figure that has depth as well as the length and width dimensions. Examples include solids such as spheres, cubes, cylinders, prisms, and pyramids. |
| Analog Clock | A way of representing time using hour and minute hands. Hours are read as the values the hand points to while minutes are read as the value it points to multiplied by 5. |
| Cents | United States currency that is a portion of a dollar. One cent is one hundredth of a dollar or 100 cents is equal to one dollar. It can be written using the ¢ symbol after the number or as a decimal using the \$ symbol. For example, 25¢ and \$0.25 both represent twenty-five cents. |
| Closed figure | A 2-dimensional shape that is completely enclosed. |
| Cube | A 3-dimensional solid that is made up entirely of equal squares and has six faces. |
| Digital Clock | A way of representing time by listing the hour first, followed by a colon and the number of minutes. Morning times are represented with am and afternoon times are representing with pm. |
| Dime | A coin that has a value of ten cents. |
| Dollars | United States currency that is usually made in the form of bills. The symbol \$ is placed in front of the amount. For example, \$5 is read as five dollars. |
| Edge | The line segments where the faces of a 3-dimensional solid meet. |
| Expanded Notation | A way of writing a number by showing the number as the sum full place value of each digit. For example, 356 written in expanded notation is $300 + 50 + 6$ |
| Face | A 2-dimensional surface of a 3-dimensional solid. For example, dice have six faces. |
| Net | A 2-dimensional representation of a 3-dimensional solid. |
| Nickel | A coin that has a value of five cents. |
| Penny | A coin that has a value of one cent. |
| Polygon | A 2-dimensional closed figure made of straight-line segments. Example: triangle, hexagon, octagon (note circles and ovals are not polygons). |
| Quarter (coin) | A coin that has a value of twenty-five cents. |

Grades 2-3 (Ages 7-9) Activities

Children in this age range are often learning about how to manage time and money.

Activity 1: Planning a Schedule

Have students make a schedule using the following description. In the first column, have them write the name of the activity. In the second column, have them write the start time and draw it on the clock. In the third column, have them write the finish time and draw it on the clock. In the fourth column, have them write how much time is allotted for that activity. Have them redraw the start and finish times in different colors and color in between the hands to show the length of time (if the length is in hours and minutes, have them color the separate pieces in different colors). Be sure to include different terminology from the word bank when talking about the time aspects.

Activity 2: Imaginative Play

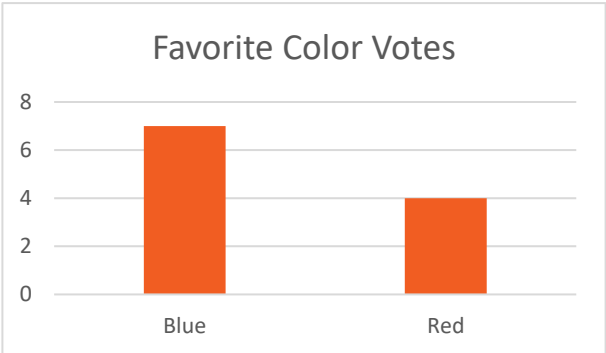
Have your child set up an imaginary store and either have play money or make play money to be used. Have students set prices for different things in the store. You can use the play money to “purchase” different items from the store. This can also be expanded by giving the child different chores that they can do to earn “money” that they could use to buy privileges. This can be play money that you create yourself. This could also be done with allowances and have students create a savings jar so that they count how much money is saved and keep track of it over time.

Activity 3: Folding Nets

You can purchase shape magnets or print out copies of some nets that can be folded into 3-dimensional figures. Have students lay out the magnets on a flat surface for the 3-D shape they want to make and then see if they can put them together to make the figure. Alternatively, they can draw them out on a piece of paper, cut them out, and then fold them to make the 3-D figure. Be sure to discuss what it means for the figures to be closed and use terms such as faces, edges, vertices (even counting them and looking for patterns). Sample nets can be found at multiple websites such as <https://www.math-salamanders.com/3d-geometric-shapes.html>.

Grades 4-5 (Ages 9-11) Vocabulary

Below is a list of vocabulary words and definitions for grades 4-5.

| Word | Definition |
|----------------------|--|
| Bar graph | <p>A graph that has labels for one axis and frequencies for the other axis. A bar is made for each label that extends to the frequency that occurs. For example, if 7 people vote for blue and 4 people vote for red a bar graph would appear as follows:</p>  |
| Decimal | A way of writing a portion of a whole by listing it as a value out of a power of ten using decimal point. For example, 2.356 is a decimal because the .356 portion is a representation of 356 out of 1000. |
| Denominator | The bottom number in a fraction or the divisor. |
| Improper fraction | A fraction with a numerator that is larger than the denominator. This represents a value larger than 1 when positive. |
| Percent | Means out of 100. When related to a fraction, it is the numerator of the fraction when the denominator is 100. When related to a decimal, it corresponds to the first two decimal places. It is written with the symbol %. Example: 32% is the same thing as 0.32 and 32/100 |
| Pictograph | A graph that is used to compare quantities of values. It is like a bar graph except that pictures are used instead of bars. |
| Pie Chart | A graph that is used to compare ratios or percents of values. It is called "pie" because it is usually drawn as a circle. |
| Stem and leaf plot | <p>A way to represent numbers that lists values with similar beginnings more efficiently.</p> <p>For example, if 3 5 is used to represent 35 one could represent 31, 33, 35, 38, and 39 as follows: 3 1, 3, 5, 8, 9</p> |
| Tenths | The first place to the right of the decimal. This is equivalent to the value out of 10. For example, 0.2 is read as two tenths and is the same as 2/10. |
| Equivalent fractions | Fractions that can reduce to the same value. For example, 3/4 and 6/8 are equivalent fractions. |
| Fraction | A ratio of two numbers or a number divided by another number. These can be written as proper fractions, improper fractions, and mixed numbers. |
| Hundredths | The second place to the right of the decimal. This is equivalent to the value out of 100. For example, 0.05 is read as five hundredths and is the same as 5/100. |
| Dot plot/Line plot | A way to show how often certain values occur. It is made up with a number line and dots are placed above the value for each occurrence. |

| | |
|---------------|---|
| Mixed number | A number that has both a whole value and a partial fraction value. |
| Numerator | The top number in a fraction or the number being divided. |
| Ordered Pair | A description of where a point is on the coordinate plane. These are written in parentheses with the x-coordinate first and the y-coordinate second. |
| Origin | This is the point where the x-axis and the y-axis intersect in the coordinate plane. It's ordered pair is (0,0). |
| Quadrant | The coordinate plane is divided into 4 sections by the x-axis and y-axis. The top right is quadrant 1, the top left is quadrant 2, the bottom left is quadrant 3, and the bottom right is quadrant 4. |
| Thousandths | The third place to the right of the decimal. This is equivalent to the value out of 1000. For example, 0.007 is read as seven thousandths and is the same as $\frac{7}{1000}$. |
| Unit fraction | A fraction that has 1 in the numerator. |
| x-axis | The horizontal line in the coordinate plane that corresponds to a y-value of 0. |
| x-coordinate | The first value in an ordered pair that relates to the horizontal location of a point in the coordinate plane. For example, (3, 2) has an x-coordinate of 3 and is a point 3 spaces to the right of the origin. |
| y-axis | The vertical line in the coordinate plane that corresponds to an x-value of 0. |
| y-coordinate | The second value in an ordered pair that relates to the vertical location of a point in the coordinate plane. For example, (3, 2) has a y-coordinate of 2 and is a point 2 spaces to the up from the origin. |

Grades 4-5 (Ages 9-11) Activities

Fractions, decimals, and percentages are key concepts in these grades. Students will begin building their core understanding of these topics and therefore need a good solid foundation as to how to talk about them using appropriate vocabulary. Below are some activities to help build such vocabulary.

Activity 1: Sharing Candy

Have the child share different quantities with siblings or friends and talk about how things are shared using fraction terms. For example, the child can make even divisions of a candy bar that comes with 12 pieces with 3 people. They can think of this as division, 12 divided by 3 gives 4. You could follow up by asking how much of the candy bar they received (4 pieces) out of the total candy bar (12 pieces). Talk about how 4 is the numerator (the part they received) and 12 is the denominator (the whole amount). This can also be related to simplifying fractions terminology by asking how much of the candy bar did they have (one fourth or one quarter of the bar).

Activity 2: Reading a Book

Read the book *If the World Were a Village* by David Smith. Discuss with your child how the denominator of the "village" is 100 because there are 100 people in the village and the numerator is the number of people in the village that fit a given criteria. Discuss with them that this relates to percents because percent means "out of 100" so if there are 32 people that fit a criteria in the village, that is 32 out of 100 or 32%. Have your child pick another topic and find the percentages of people in the world that fit into

different criteria for that topic. Have them determine what that means for the village. They can write a new section for the book to talk about this topic in the village.

Activity 3: Reviewing Charts

Have your child read an age-appropriate article online or in a newspaper or magazine that involves something of interest to them. Discuss with your child what kinds of charts and graphs are provided in the article and what they mean. Have your child think about something they want to explain with a chart or graph (this could be something like their stats in a game they play, comparing numbers of different types of toys, etc.). Have them decide what chart would best illustrate this information and help them create it.

Activity 4: Playing a Game

There are several activities that can be used to practice graphing. For example, playing a game of Battleship can be a great way to get students used to finding values in a grid. You can even adjust the game of battleship (and make it free) by using coordinate planes and plotting points to make your “ships.” Another great activity could be gardening. Many plants need a specific amount of room for growth and gardens can be formed into a grid for planting.

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