Grade 6 Mathematics
Vocabulary Word Wall Cards

Mathematics vocabulary word wall cards provide a display of mathematics content words and associated visual cues to assist in vocabulary development. The cards should be used as an instructional tool for teachers and then as a reference for all students. The cards are designed for print use only.

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Ratio

a comparison of any two quantities
Equivalent Relationships

\[ 56\% = \frac{56}{100} = \frac{14}{25} = 0.56 \]

| ▲ to □ | 4 to 3 or 4:3 |
| ▲ to all of set A | 4 to 7 or 4:7 or \( \frac{4}{7} \) |
| □ (set A) to ● (set B) | 3 to 5 or 3:5 |
| set B to set A | 9 to 7 or 9:7 |
\[ 2 \frac{4}{9} = 2.444... = 244\overline{4}\% \]

\[ 1.8 = 180\% = \frac{180}{100} = 1 \frac{4}{5} \]
Equivalent Relationships

Fraction: \( \frac{8}{20} = \frac{2}{5} \)

Decimal: 0.4

Percent: 40%
Absolute Value

distance a number is from zero

\[ |5| = 5 \quad |{-5}| = 5 \]
Perfect Squares

\[0^2 = 0 \cdot 0 = 0\]
\[1^2 = 1 \cdot 1 = 1\]
\[2^2 = 2 \cdot 2 = 4\]
\[3^2 = 3 \cdot 3 = 9\]
\[4^2 = 4 \cdot 4 = 16\]
\[5^2 = 5 \cdot 5 = 25\]
\[6^2 = 6 \cdot 6 = 36\]
\[7^2 = 7 \cdot 7 = 49\]
\[8^2 = 8 \cdot 8 = 64\]
\[9^2 = 9 \cdot 9 = 81\]
\[10^2 = 10 \cdot 10 = 100\]
Exponential Form

$2^3 = 2 \cdot 2 \cdot 2$

$n^4 = n \cdot n \cdot n \cdot n \cdot n$

- **base**
- **exponent**
- **factors**
## Powers of Ten

<table>
<thead>
<tr>
<th>Power of Ten</th>
<th>Meaning</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$10^5$</td>
<td>$10 \cdot 10 \cdot 10 \cdot 10 \cdot 10$</td>
<td>100,000 One hundred thousand</td>
</tr>
<tr>
<td>$10^4$</td>
<td>$10 \cdot 10 \cdot 10 \cdot 10$</td>
<td>10,000 Ten thousand</td>
</tr>
<tr>
<td>$10^3$</td>
<td>$10 \cdot 10 \cdot 10$</td>
<td>1,000 One thousand</td>
</tr>
<tr>
<td>$10^2$</td>
<td>$10 \cdot 10$</td>
<td>100 One hundred</td>
</tr>
<tr>
<td>$10^1$</td>
<td>10</td>
<td>10  Ten</td>
</tr>
<tr>
<td>$10^0$</td>
<td>1</td>
<td>1  One</td>
</tr>
</tbody>
</table>
Fraction Multiplication

How much is $\frac{3}{8}$ of $\frac{2}{3}$?

$\frac{3}{8} \cdot \frac{2}{3} = \frac{6}{24}$

$\frac{3}{8} \cdot \frac{2}{3} = \frac{6}{24} = \frac{1}{4}$
Fraction Division

\[
\frac{3}{4} \div \frac{1}{2} = \frac{1}{2}
\]

How many halves are in three-fourths?

There are 1 \(\frac{1}{2}\) halves in three-fourths.
Fraction Division

\[
\frac{3}{4} \div \frac{1}{2}
\]

How many halves are in three-fourths?

There are \(1\frac{1}{2}\) halves in three-fourths.

\[
\frac{3}{4} \div \frac{1}{2} = 1 \frac{1}{2}
\]
# Multiplication and Division of Decimals

<table>
<thead>
<tr>
<th>Multiplier</th>
<th>Multiply</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27 ∙ 1</td>
<td>27</td>
</tr>
<tr>
<td>0.1</td>
<td>27 ∙ 0.1</td>
<td>2.7</td>
</tr>
<tr>
<td>0.01</td>
<td>27 ∙ 0.01</td>
<td>0.27</td>
</tr>
<tr>
<td>0.001</td>
<td>27 ∙ 0.001</td>
<td>0.027</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Divisor</th>
<th>Divide</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>27 ÷ 1</td>
<td>27</td>
</tr>
<tr>
<td>0.1</td>
<td>27 ÷ 0.1</td>
<td>270</td>
</tr>
<tr>
<td>0.01</td>
<td>27 ÷ 0.01</td>
<td>2,700</td>
</tr>
<tr>
<td>0.001</td>
<td>27 ÷ 0.001</td>
<td>27,000</td>
</tr>
</tbody>
</table>
Comparing Integers

-5 < 1 or 1 > -5

-5 < -4 or -4 > -5
Integer Operations

Addition
-5 + 6 = 1

Subtraction
1 − 6 = -5
Integer Operations

Key:  

Addition

-5 + 6 = 1

Subtraction

1 - 6 = -5
Integer Operations

Multiplication
3 \cdot (-4) = -12

How many tiles are in 3 groups of -4 tiles?

Division
-12 \div -4 = 3

How many groups of -4 tiles are in -12 tiles?
Order of Operations

Grouping Symbols

Exponents

Multiplication or Division

Addition or Subtraction
<table>
<thead>
<tr>
<th>$\pi$ approx</th>
<th>3.14159...</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3.14</td>
</tr>
<tr>
<td></td>
<td>$\frac{22}{7}$</td>
</tr>
</tbody>
</table>

$\pi = \frac{\text{circumference}}{\text{diameter}}$
Circumference

\[ C = \pi d \]

\[ C = 2\pi r \]

\[ C = \text{perimeter of a circle} \]
Area of a Circle

\[ A = \pi r^2 \]
Perimeter

the measure of the distance around a figure

\[ P = a + b + c + d \]

\[ P = e + f + g \]
Area

the number of square units needed to cover a surface or figure

Area = 12 Square Units
Coordinate Plane

ordered pair \((x, y)\)
What is the length of side AB in the figure ABCD?
A(-1,-2) and B(-1,-4)
The length of AB is |\(-2 - (-4)\)| or |\(-4 - (-2)\)| or 2 units.
Congruent Figures
have exactly the same shape and size

\[ AB \cong PQ \]

\[ \angle BAC \cong \angle PQR \]

\[ \square ABCD \cong \square HGFE \]
Regular Polygons

have congruent sides and congruent interior angles
Line of Symmetry

divides a figure into two congruent parts, each of which are mirror images of the other
Mean

a measure of central tendency
(the numerical average of a data set)

2, 3, 4, 7

Balance Point

\[
\frac{2+3+4+7}{4} = \frac{16}{4} = 4
\]
Median

a measure of central tendency
(the middle value of a data set ranked in order)

6, 7, 8, 9, 9
8 = median

5, 6, 8, 9, 11, 12
8.5 = median
Mode

a measure of central tendency
(the data value that occurs most frequently)

<table>
<thead>
<tr>
<th>Data Sets</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>2, 3, 3, 3, 5, 5, 9, 10</td>
<td>3</td>
</tr>
<tr>
<td>5.2, 5.4, 5.5, 5.6, 5.8, 5.9, 6.0</td>
<td>none</td>
</tr>
<tr>
<td>1, 1, 2, 5, 6, 7, 7, 9, 11, 12</td>
<td>1, 7</td>
</tr>
</tbody>
</table>

bimodal
Range

difference between the greatest and least values in a data set

Data set

\[ 2 \frac{1}{2}, 3, 3 \frac{3}{4}, 3 \frac{7}{8}, 5, 5 \frac{1}{2}, 9 \frac{1}{6}, 10 \frac{4}{5}, 15 \frac{1}{2}, 20 \]

\[ 20 - 2 \frac{1}{2} = 17 \frac{1}{2} \]

Range = \[17 \frac{1}{2}\]
Circle Graph

Types of Animals on Mr. Segal’s Farm

- Pigs: 35%
- Chickens: 20%
- Cows: 30%
- Sheep: 15%
- Goats: 10%
Comparing Graphs

Types of Animals on Mr. Segal’s Farm

Which graph(s) shows the type of animal that is most common on Mr. Segal’s farm?
Which graph(s) shows how many pigs are on Mr. Segal’s farm?
Which graph(s) help(s) determine the total number of animals on Mr. Segal’s farm?
Which graph(s) help(s) determine for which type of animals there are 3 or more?
Which graph(s) help(s) determine the percent of animals with four legs?
Comparing Graphs

Types of Animals on Mr. Segal’s Farm

Which graph(s) shows the type of animal that is most common on Mr. Segal’s farm?
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Which graph(s) help(s) determine the percent of animals with four legs?
Comparing Graphs
Types of Animals on Mr. Segal’s Farm

Number of Animals

Circle Graph

Line Plot

Which graph(s) shows the type of animal that is most common on Mr. Segal’s farm?
Which graph(s) shows how many pigs are on Mr. Segal’s farm?
Which graph(s) help(s) determine the total number of animals on Mr. Segal’s farm?
Which graph(s) help(s) determine for which type of animals there are 3 or more?
Which graph(s) help(s) determine the percent of animals with four legs?
Ratio Table

a table of values representing a proportional relationship that includes pairs of equivalent ratios

The ratio of $y$ to $x$ in a proportional relationship is 8:4, create a ratio table.

<table>
<thead>
<tr>
<th>$x$</th>
<th>$y$</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td>3</td>
<td>6</td>
</tr>
<tr>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>11</td>
<td>22</td>
</tr>
</tbody>
</table>

\[
\frac{y}{x} = \frac{2}{1} = \frac{6}{3} = \frac{8}{4} = \frac{22}{11}
\]
Proportional Relationship

Ratio Table Example

Terry’s neighbor pays him $17 for every 2 hours he works. Terry works for 8 hours on Saturday.

A ratio table represents the proportional relationship:

<table>
<thead>
<tr>
<th>Hours</th>
<th>1</th>
<th>2</th>
<th>4</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pay in $</td>
<td>?</td>
<td>17</td>
<td>34</td>
<td>?</td>
</tr>
</tbody>
</table>

How much does Terry earn per hour?

\[
\frac{17}{2} = \frac{?}{1}
\]

Terry earns $8.50 per hour

How much will Terry earn in 8 hours?

\[
8.50 \cdot 8 = 68.00
\]

He will earn $68.00 in 8 hours.
Unit Rate

number of units of the first quantity of a ratio compared to 1 unit of the second quantity

Example: A store advertises $25 for 5 DVDs. Find the cost for 1 DVD or unit rate.

\[
\frac{25}{5} = \frac{?}{1}
\]

The unit rate is $5.00 for 1 DVD
Unit Rate

Examples

$2 \text{ per gallon} = \frac{\$2}{1 \text{ gallon}}$

$70 \text{ miles per hour} = \frac{70 \text{ miles}}{1 \text{ hour}}$
Connecting Representations

The ratio of gallons of yellow paint to gallons of blue paint is 3:1.

Find three equivalent ratios.

- Tape diagram: 3:1, 6:2, 9:3, 12:4
- Double number line:
  - Yellow: 3, 6, 9, 12
  - Blue: 1, 2, 3, 4
- Graph:
  - Yellow increases linearly with blue.
Equation

a mathematical sentence stating that two expressions are equal

\[ 2x = 10 \]

\[ -38 = y - (-21) \]

\[ \frac{1}{3}x = -16 \]
Expression

a representation of quantity

$16$

$x$

$2 + 3^4$

$3(2 + 3.9) - \frac{8}{9}$
Variable
a symbol used to represent an unknown quantity

\[ y \]

\[ 3 + x = 2.08 \]

\[ A = \pi r^2 \]
Coefficient
the numerical factor in a term

\((-4) = 2x\)

\((-7)y\)

\(\frac{1}{3} a = -5\)
Term

a number, variable, product, or quotient in an expression of sums and/or differences

$$3y^2 + 2y - 8$$

3 terms

$$-5x + (-2)$$

2 terms

$$\frac{2}{3}a$$

1 term
## Verbal and Algebraic Expressions and Equations

<table>
<thead>
<tr>
<th>Verbal</th>
<th>Algebraic</th>
</tr>
</thead>
<tbody>
<tr>
<td>A number multiplied by 5</td>
<td>$5n$</td>
</tr>
<tr>
<td>The sum of negative two and a number</td>
<td>$-2 + n$</td>
</tr>
<tr>
<td>The sum of a number and two is five</td>
<td>$y + 2 = 5$</td>
</tr>
<tr>
<td>Negative three is one-fifth of a number</td>
<td>$-3 = \frac{1}{5}x$</td>
</tr>
</tbody>
</table>
Inequality

\[ y < 4 \text{ or } 4 > y \]

\[ x + (-5) \geq -7 \]
\[ x \geq -2 \]

\[ -3 < a - 7 \]
\[ 4 < a \text{ or } a > 4 \]