The Learning Wall

G - L

The 3 – 5 MATH Concept Learning Bricks packet is organized alphabetically, with each concept explanation (concept, question, answer, gesture, and examples) listed first and the Concept Learning Brick visual listed behind the explanation. This section contains **30** Concept Learning Bricks from the G through L sections. Please refer to The Learning Wall Introduction and Explanation at www.PEPnonprofit.org for details on how to implement these items in your classroom.

Gg
gallon, graph, greater than, greatest common factor (GCF)

Hh
half dollar, half hour, hexagon, histogram, horizontal, hour, hundredth

Ii
impossible event, improper fraction, inch, inequality, integer, intersecting lines, inverse operation, isosceles triangle

Jj

Ll
least common denominator (LCD), least common multiple (LCM), less than, likely event, line, line graph, line of symmetry, line segment, liter

Kk
kilogram, kilometer

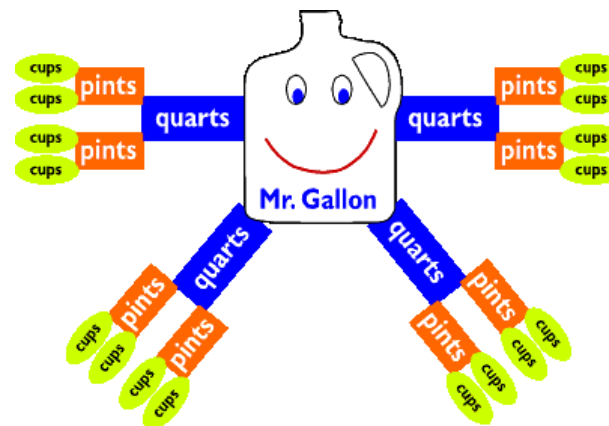# Gallon

gallon

Question: What is a gallon?

Answer: A gallon is used to measure liquids and is equal to four quarts.

Gesture: Touch each of your four limbs (each arm and each leg which represent the four quarts).

Examples: Have your students create a Mr. Gallon to help them remember the capacities associated within a gallon (see picture). Also, have your students brainstorm as many things as they can that would/could be measured in gallons.

gallon

Graph

Question: What is a graph?

Answer: A graph is a diagram of values, usually shown as lines, bars, or parts of a circle.

Gesture: Draw a line with your finger (line graph). Hold your forearms up next to each other (bar graph). Draw a circle in the air with your finger (circle graph).

Examples: Given your students different sets of data. Have them decide which type of graphs would be most appropriate to display the data. Example: 32% of Americans, 12% of Lithuanians, 21% of Germans, 27% of Spaniards, and 8% of others have gained more than 30 pounds in the past four years. Which graph would be used?

100

graph

Greater Than

greater than

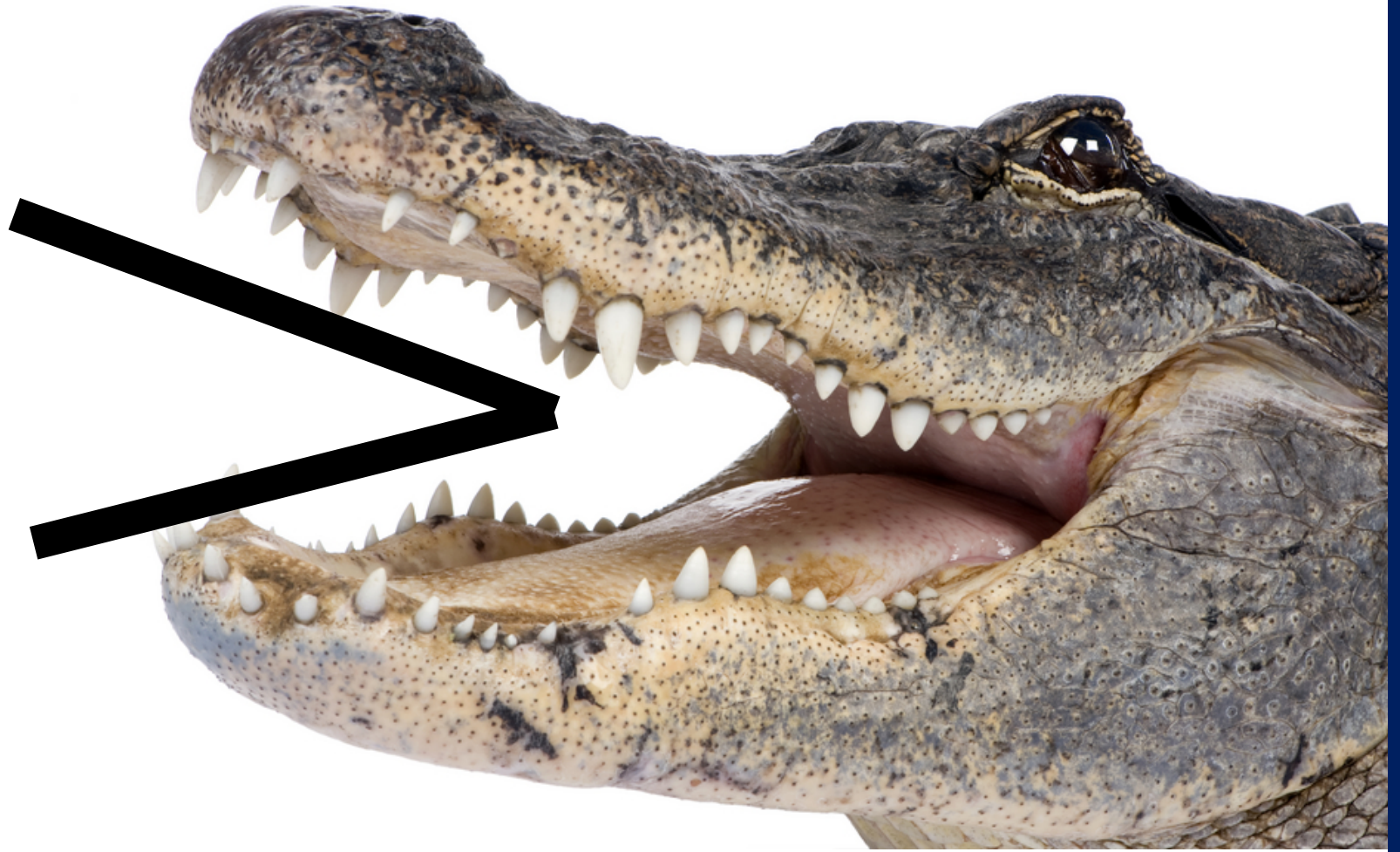**Question:** What is greater than?
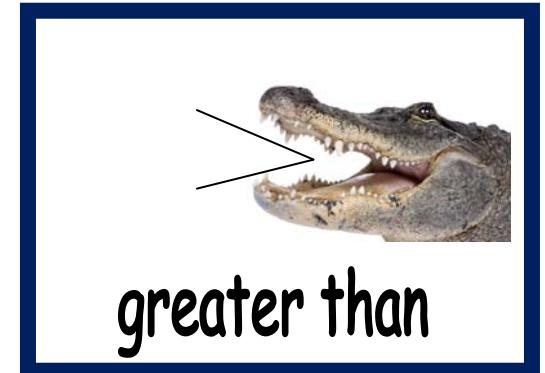
Answer: Greater than means bigger. The symbol > means greater than.

Gesture: Hold your hand in the shape of the greater than symbol, then stretch your hands wide apart to show bigger.

Examples: Give pairs of students a sticky note with a greater/lesser than symbol drawn on it. Next give each pair a deck of playing cards with all face cards and 10s removed. Kids deal out three cards to each player. The player tries to make the largest number possible with those three cards. When both players have their cards on the desk, have them agree which number is larger and place the sticky note in the middle to signify which is greater and lesser than.
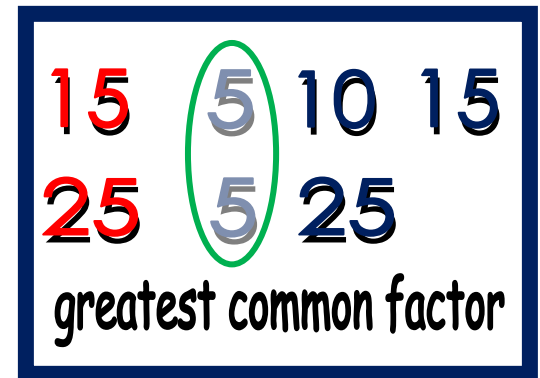
>

greater than

Greatest Common Factor (GCF)

greatest common factor

Question: What is greatest common factor (GCF)?

Answer: The greatest common factor is the largest number that factors evenly into two or more larger numbers. For example, the greatest common factor (GCF) of 15 and 25 is 5, because 5 is the largest number that goes into 15 and 25 evenly.

Gesture: Hold hands far apart (greatest or biggest). Clasp hands (common factor).

Examples: Provide students with real world situations.

Situation 1. Oscar needs to ship 14 rock CDs, 12 classical CDs, and 8 pop CDs. He can pack only one type of CD in each box, and must pack the same number of CDs in each box What is the greatest number of CDs Oscar can pack in each box?

Situation 2. The list shows the amounts of money the club leader collected from members for a camping trip. Each member paid the same amount. What is the most the camping trip could cost per member? Explain. List: Wednesday $36, Thursday $56, Friday $72.

15 5 10 15

25 5 25

greatest common factor

Half Dollar

half dollar

Question: What is a half dollar?

Answer: A half dollar is a coin equal to 50 cents.

Gesture: Hold up five fingers on one hand, and make a zero on the other hand to show a half dollar is worth fifty cents.

Examples: Show how one half dollar can be written 50¢ or $0.50. Put students in groups of two or three. Give each group a cup with an assortment of coins (preferably real coins). Have the groups create money puzzle problems with their coins. For example, How many ways can you make the total $0.75. What are my coins? Since we are working on half dollars, you must include one half dollar in every money puzzle problem.

half dollar

Hexagon

hexagon

Question: What is a hexagon?

Answer: A hexagon is a six sided polygon.

Gesture: Draw a hexagon in the air with your finger, then pretend to turn a wrench.

Examples: Hexagon art project. Using a hexagon die cut, create a multitude of hexagons from many different pieces of construction paper and pictures from magazines. Allow the students the choose as many hexagons as they like to create an artistic honeycomb art project.
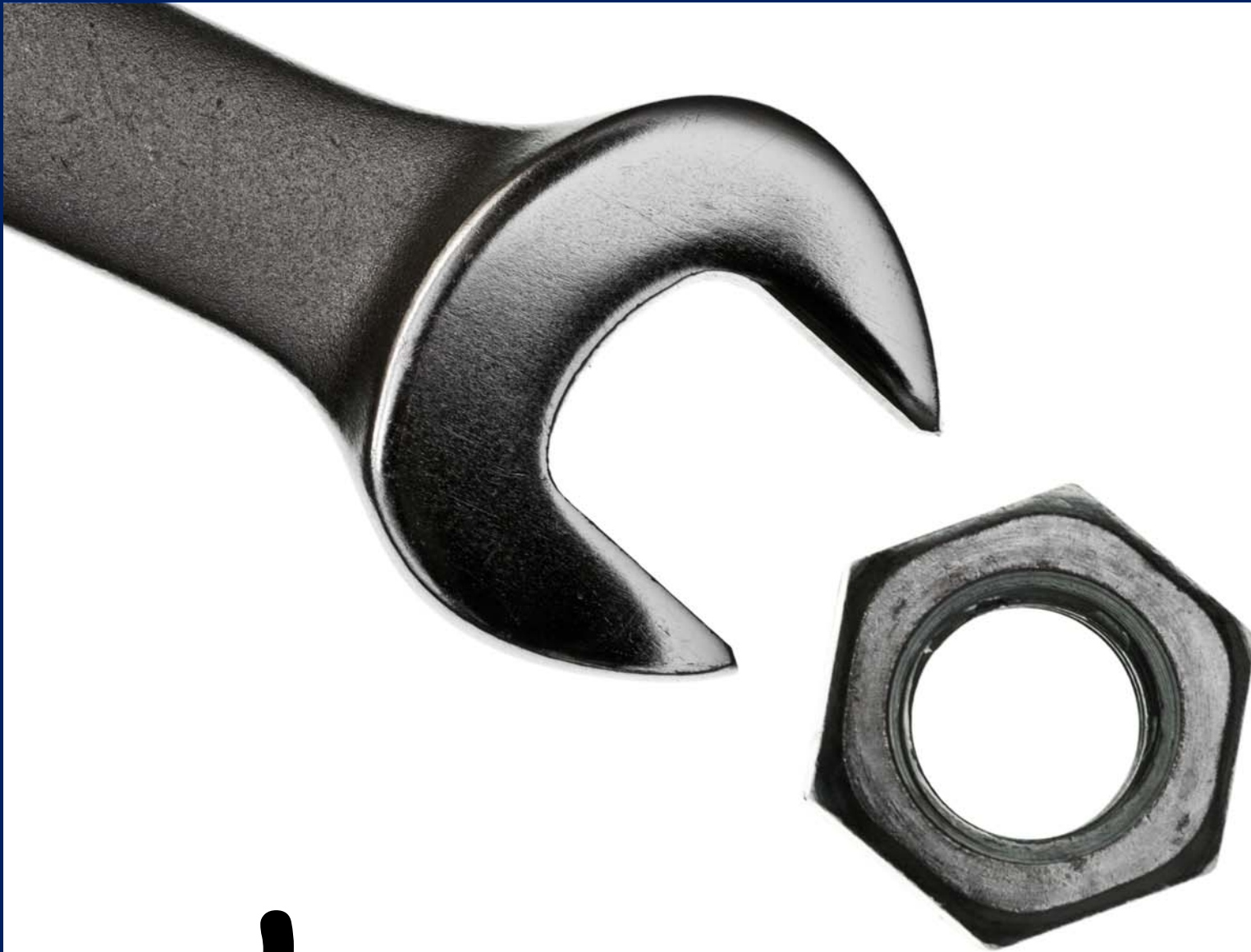
hexagon

Histogram

histogram

Question: What is a histogram?

Answer: A histogram is a graph that uses vertical bars to show how many times something occurs. Histograms do not have any spaces between the bars.

Gesture: Hold up five fingers, then hold your arm vertically. Next, hold up three fingers, and hold your other arm next to your first vertical arm (but not as high, since three is smaller than five).

Examples: Give students this example: If a histogram showed the number of books students read during several months (in intervals) on the x-axis, the y-axis would show the number of students. Using an AR class snapshot, or some other way to record how many books your class has read, create a whole class histogram with the real student data.
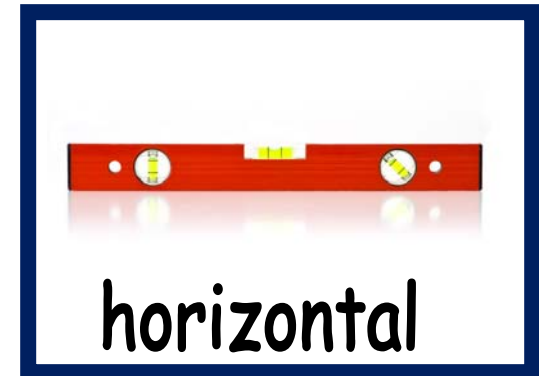
histogram

Horizontal
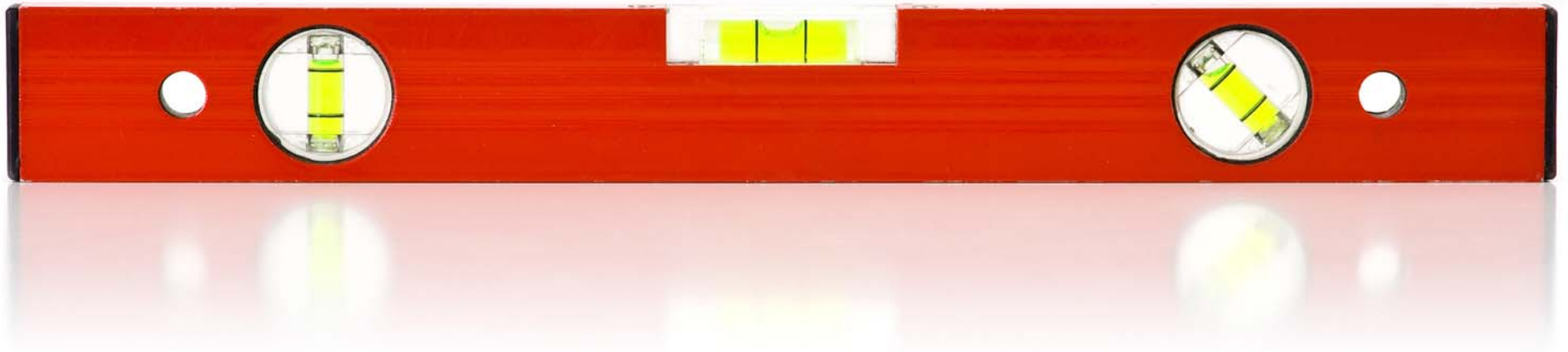

horizontal

Question: What is horizontal?

Answer: A horizontal line is a line that runs left to right on a page, or is parallel to the ground.

Gesture: Hold a single arm in a horizontal position to the ground.

Examples: Write math problems (all vertical addition or subtraction) on your board. Have students rewrite each of the problems a different way. See if they come up with the horizontal version. Explain that when we write problems (or draw lines) left to right on the page is called horizontal. See if the students can come up with other examples of things that are horizontal in the real world.

horizontal

Hour

hour

Question: What is an hour?

Answer: An hour is equal to 60 minutes. It takes about an hour to listen to an entire CD of music (hopefully kids will still recognize a CD).

Gesture: Hold up six fingers and then make a zero with your hand. Hold both arms parallel to the ground (equal sign). Then hold up one finger for an hour.

Examples: Have students brainstorm a list of things that take about an hour to complete. Some possible examples may include: bake a cake, drive 60 miles, watch two TV shows, or play an entire game of soccer.
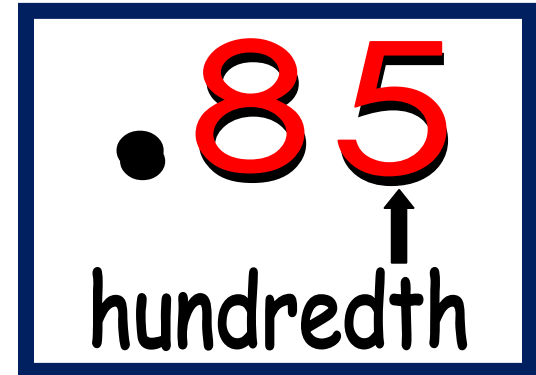
hour

Hundredth

.85
hundredth

Question: What is a hundredth?

Answer: A hundredth is one out of a hundred equal parts. It is also the second number after a decimal point.

Gesture: Punch a decimal point, then hold up two fingers to represent the hundredths spot.

Examples: Take 10 separate pieces of paper and label them each from 0 to 9. Give a student two bean bags to throw at different numbers to create a number. For example, if a student throws bags on a 2 and a 3, he or she forms the number 23. Next have the class decide what that number would be if it were out of a hundred. How do we write 23 hundredths? Repeat several times so all of your students get a chance to throw in the bean bags. *This can be done with a deck of cards as well. Pull the face cards and tens and have students draw two cards and name it out of a hundred.

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.85
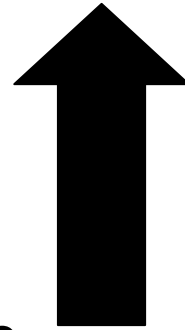
hundredth

Impossible Event

impossible event

Question: What is an impossible event?

Answer: An impossible event has no chance of happening. It is impossible to pull a blue marble from a group of all red marbles.

Gesture: Hold both hands together forming a large ZERO and shake your head.

Examples: Try some probability examples with the kids. For example, how likely is it to pick a red card from the deck (equally likely). Try a few others, then try to trick them with this. A total of five cards are chosen at random from a standard deck of 52 playing cards. What is the probability of choosing 5 aces? It is impossible to choose 5 aces since a standard deck of cards has only 4 of a kind. This is an impossible event.
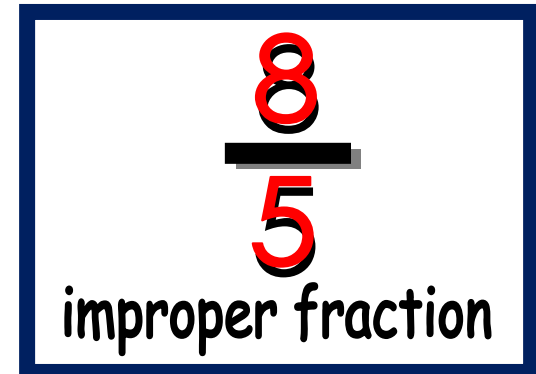
impossible event

Improper Fraction

$$\frac{8}{5}$$
improper fraction

Question: What is an improper fraction?

Answer: An improper fraction is a fraction where the numerator (the top number) is greater than or equal to the denominator (the bottom number). In other words, it is top-heavy.

Gesture: Hold your hands far apart up high (to show a large number up top). Make a slash with your arm for the fraction line. Hold your hands close together down low (to show the smaller number down below).
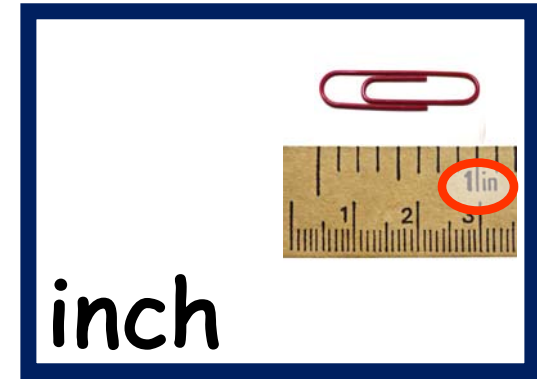
Examples: Write a variety of mixed numbers on your board: 3 ½ , 5 ¾ , etc…. Have the kids come up with the improper fraction for each mixed number.

$$\frac{8}{5}$$

improper fraction

Inch

inch

Question: What is an inch?

Answer: An inch is a measurement of length. There are twelve inches in a foot.

Gesture: Hold your thumb and pointing finger apart about the distance of a paperclip (or an inch). Then hold up one finger on one hand and two fingers on the other hand to represent twelve inches are in a foot.

Examples: Give students a handful of paperclips (small size that are close to one inch). Have them measure a book, pencil, or some other object with the paperclips. Next have them measure the same objects with an inch ruler to see if their estimations were close or not. *Note: kids can link the paperclips together when measuring objects.

1 in

1 2 3

inch

Inequality

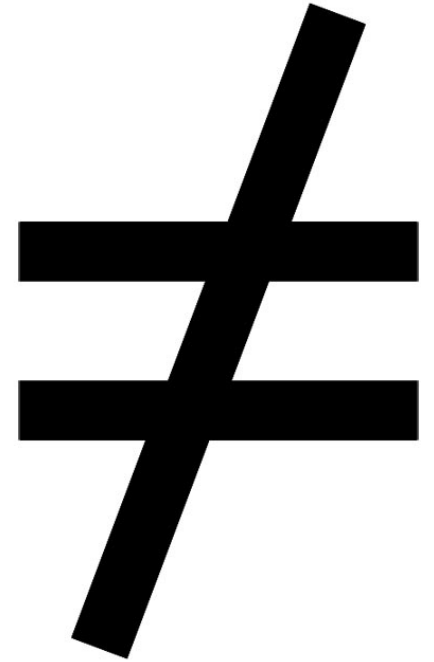inequality

Question: What is an inequality?
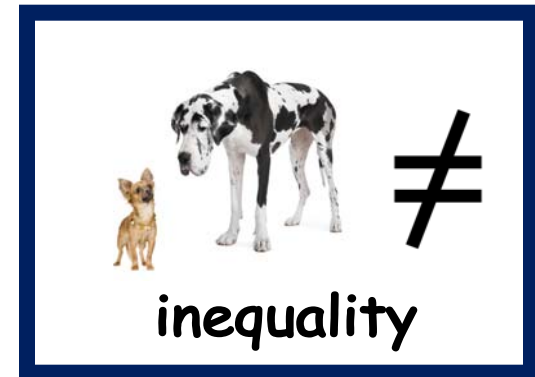
Answer: An inequality is when two values are not equal.

Gesture: Hold five fingers up on one hand. Hold both arms parallel to the ground, then make a slash (inequality sign). Hold up two fingers up on the other hand.

Examples: Start by showing physical examples of quantities. Three oranges in one hand and two oranges in the other hand. Introduce the term inequality and it's meaning. Next, write a variety of number sentences on the board, but leave out the equal or inequality sign. For example: 7 + 3   10, 7 X 4   16 + 5 + 7, 12 – 5   7 +2, and 45 – 5   8 X 6.
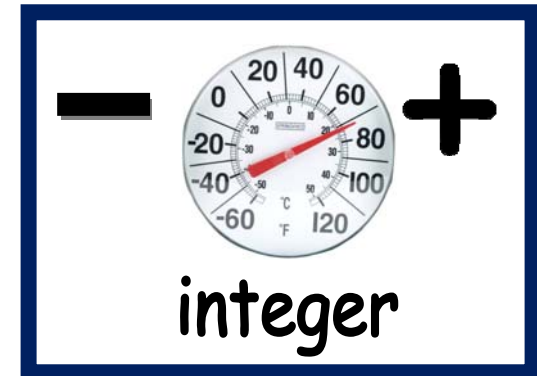
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≠

inequality

Integer
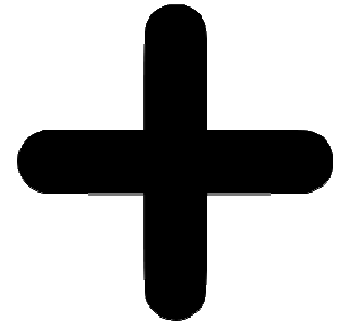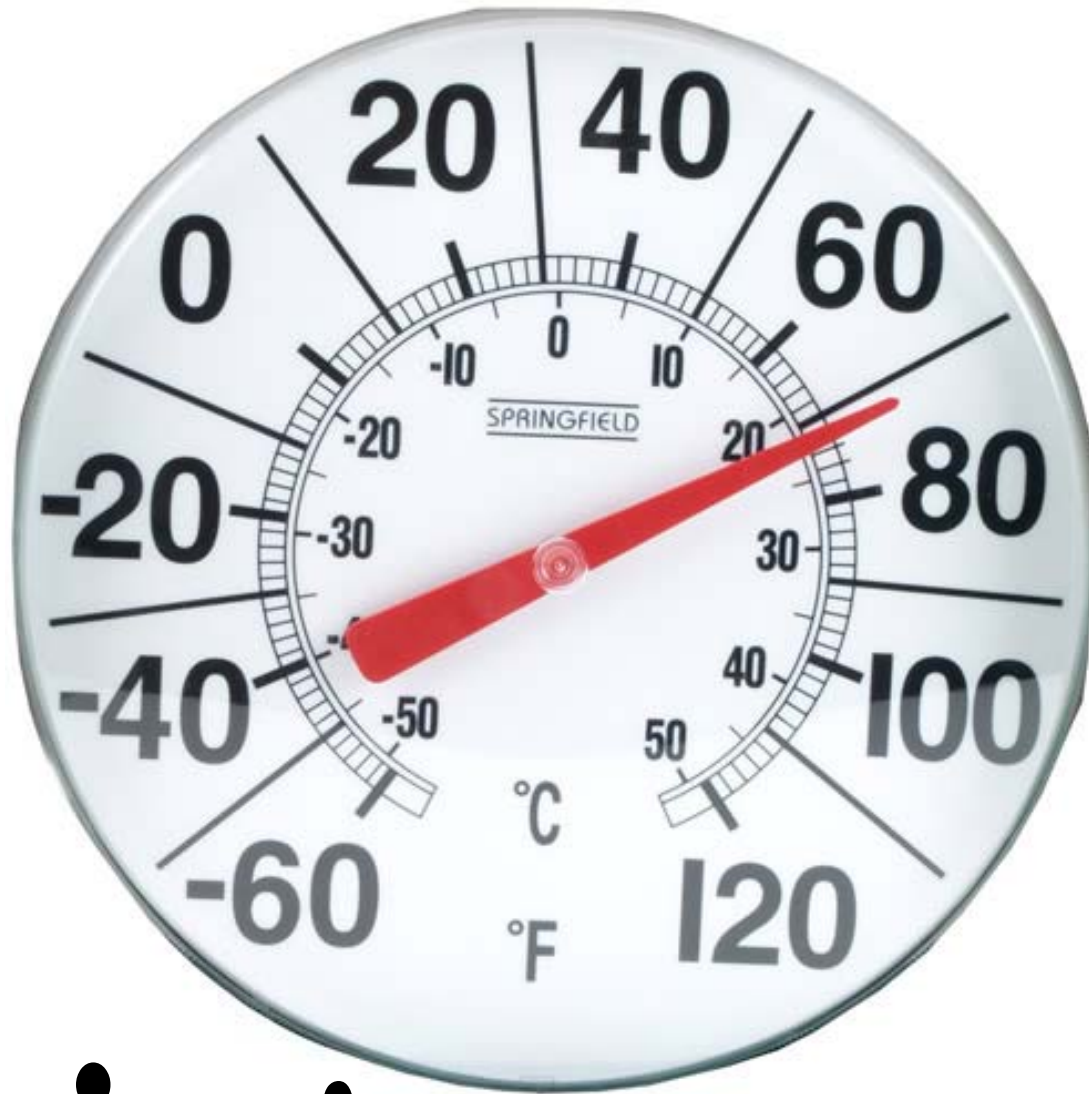

integer

Question: What is an integer?

Answer: An integer is a number with no fractional part. (4, 9, - 17)

Gesture: Hold up 4 fingers and then cross your forearms (positive) and then hold one forearm parallel to the ground (negative).

Examples: Show students that integers can be both positive and negative. Show a thermometer that has both sets of integers. Give some different weather reports from around the world and have students plot them on the thermometer (on board or desk copy). Have students represent the following situations: the temperature goes up 15 degrees from 40, the temperature drops 4 degrees from the previous temperature. Now try money: you have $5, you owe $8.
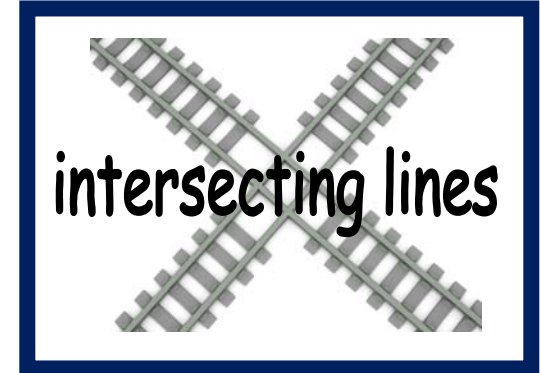
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+

SPRINGFIELD

20 40 60 80 100 120
0
-20
-40
-60
-10 0 10
-20 20
-30 30
-50 50 40
°C
°F

integer

Intersecting Lines

intersecting lines

Question: What are intersecting lines?

Answer: Intersecting lines are lines that cross over and have a common point.

Gesture: Hold both arms out in front of you and then have them cross over to form intersecting lines.

Examples: Group students in small groups of about four. Their objective is to develop their own dance that meets criteria of both parallel and intersecting lines. While the groups perform their dances for the class, audience members will use a record sheet to identify intersecting and parallel movements as they are occurring.

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intersecting lines

Inverse Operation

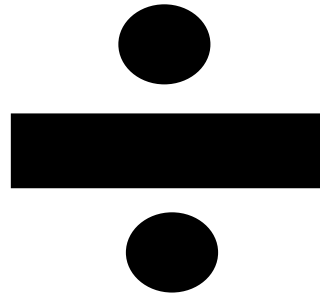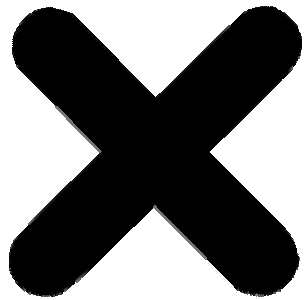**Question:** What is an inverse operation?
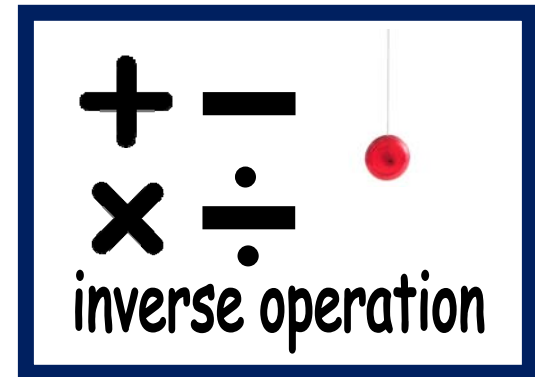
Answer: An inverse operation is the operation that reverses the effect of another operation. Addition is the inverse operation of subtraction. Multiplication is the inverse operation of division. Like the opposite of a yo-yo going down is the yo-yo going back up.

Gesture: Pretend to flick you wrist like you were playing with a yo-yo (the opposite of down is up).

Examples: Provide a word problem: Tammy brought several cans of soda to the picnic. Bill brought 12 cans of soda to the picnic. Tammy could not remember how many cans she brought. Bill counted 20 cans. How can Tammy use the fact that her cans added to Bill's cans made 20 cans to find the number of cans she brought? What operation was used? What operation would undo the situation? (Subtraction) How would you find the number of cans Sandy brought?
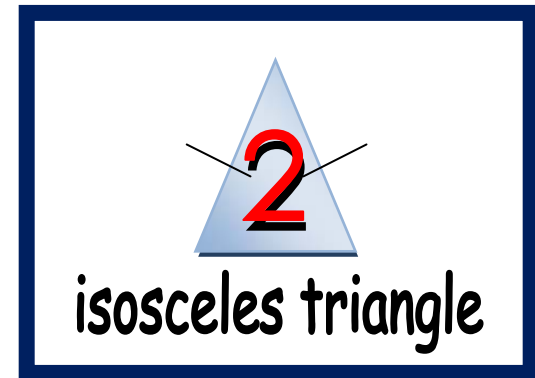
+ − × ÷

inverse operation

Isosceles Triangle

Question: What is an isosceles triangle?

Answer: An isosceles triangle is a triangle with two equal sides. I saw a triangle with two equal sides.

Gesture: Draw a triangle in the air and point to your eyes with two fingers and then hold those two fingers up in the air.

Examples: Provide multiple examples of different types of triangles. Have kids sort triangles into proper categories and write reasons why they sorted their triangles the way they did.
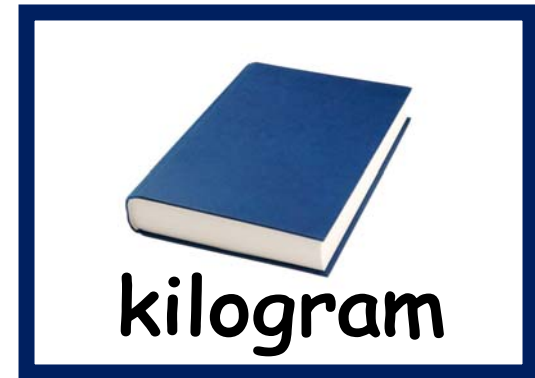
2

isosceles triangle

Kilogram

Question: What is a kilogram?

Answer: A kilogram is a METRIC measurement of mass. The abbreviation is kg.

Gesture: Pretend to open a book. Hold both arms parallel to the ground (equal sign). Hold up one finger to represent one kg.

Examples: Bring in a dictionary, a bag of rice and a liter bottle of water. Tell the students that all of these things have something in common. Let the students make predictions on what they all have in common. If no one answers they all weigh the same, let them lift each item and tell them that each of these items weigh approximately one kilogram. Explain the difference between a kilogram and a pound. Let the students create a list of other things that they think weigh one kg. If possible, have them bring in some of the items on the list the next day and see if they are correct.

kilogram

Kilometer

kilometer

Question: What is a kilometer?

Answer: A kilometer is a METRIC measurement of distance. The abbreviation is km.

Gesture: Pretend to hold a steering wheel. Hold both arms parallel to the ground (equal sign). Hold up one finger to represent one km.

Examples: Understanding metric measurements is important because most parts of the world use the metric system. Explain that kilometers are used to measure long distances, which is the measurement between two places or points. For example, the distance from one end of the country to the other can be measured in kilometers. Have children use a map to find distances to different points of interest. Children choose the correct unit to use to measure different objects or distances. Why would you measure a pencil in centimeters? Why shouldn't you use kilometers to measure a crayon? Discuss together and have children point out what units they would use to measure different objects.
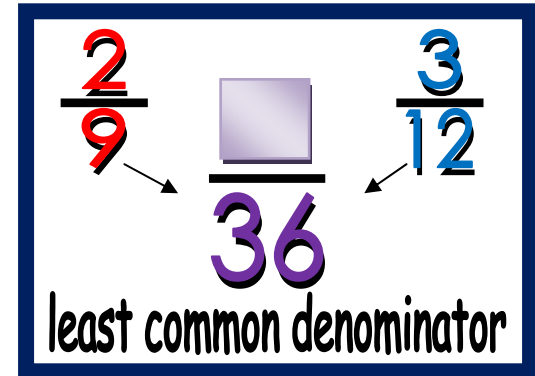
kilometer

Least Common Denominator (LCD)
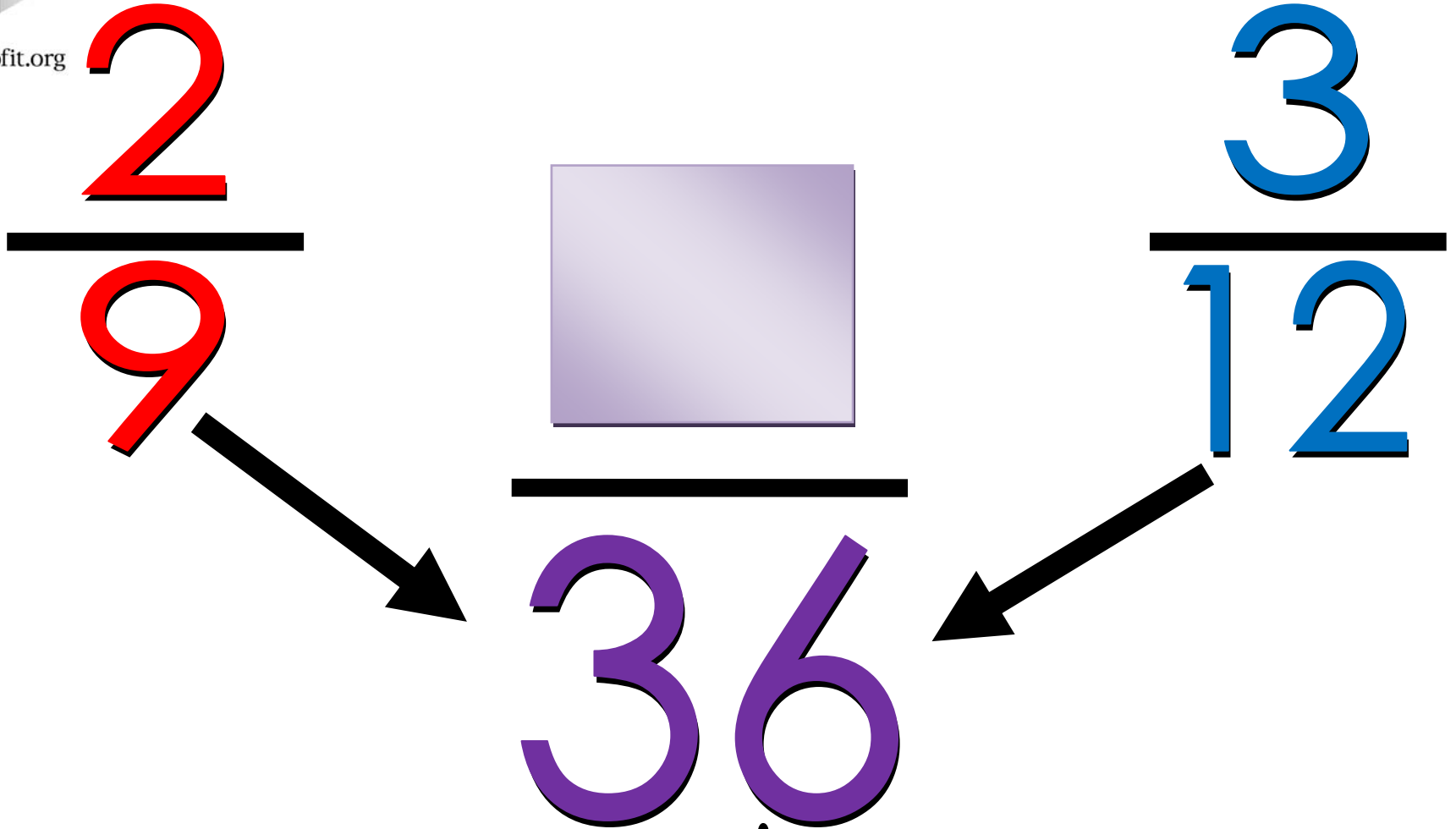

least common denominator

Question: What is the least common denominator (LCD)?

Answer: The least common denominator is the smallest number that can be used for all denominators of 2 or more fractions.

Gesture: Hold hands close together, but not touching (least). Clasp hands (common). Make a slash with your arm and point down (denominator).

Examples: Many of "least common denominators" are rather obvious; with this in mind, start by showing many examples of obvious situations that will allow them to use an intuitive method. From these examples, students will discover a strategy that will allow them to quickly and easily mind most LCDs.

$$\frac{2}{9} \qquad \qquad \frac{3}{12}$$

$$\frac{}{36}$$

least common denominator

Least Common Multiple (LCM)

least common multiple

Question: What is the least common multiple (LCM)?

Answer: The least common multiple is the smallest number that is a multiple of two or more numbers.

Gesture: Hold hands close together, but not touching (least). Clasp hands (common). Make a X with your arms (multiple).

Examples: Provide your students with a real life problem. You and four friends go to lunch on Taco Tuesday and find a deal on packages of 6 tacos. You want to buy the minimum number of packages so you each get the same number of tacos and none are left over. How many packages must you buy?

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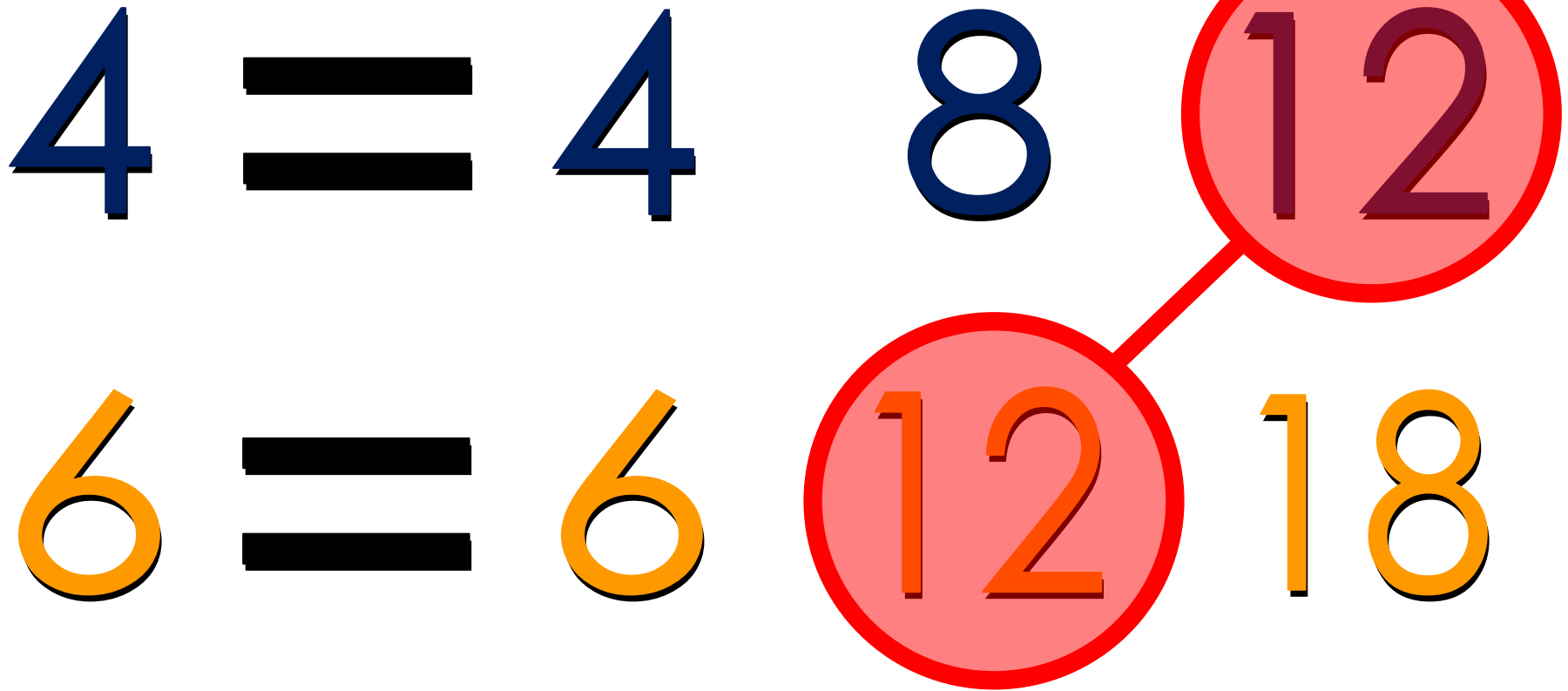
Less Than

less than

Question: What is less than?

Answer: Less than means smaller or fewer. The symbol < means less than.

Gesture: Hold your hand in the shape of the less than symbol, then put your hands close together to show smaller.

Examples: Give pairs of students a sticky note with a greater/lesser than symbol drawn on it. Next give each pair a deck of playing cards with all face cards and 10s removed. Kids deal out three cards to each player. The player tries to make the smallest number possible with those three cards. When both players have their cards on the desk, have them agree which number is smaller and place the sticky note in the middle to signify which is greater and lesser than.

less than

Likely Event

likely event

Question: What is a likely event?

Answer: A likely event has a very good chance of happening, but is not certain. It is likely to pull a blue marble from a group of 12 blue marbles and 1 red marble.

Gesture: Nod your head as you pretend to pull a marble from a bag.

Examples: Chose a student to come to the front of the class. Ask the class who they think will win if you and the student race across the classroom. Let the student have a 1/2 of the room head start. Now ask the class who they think will win.
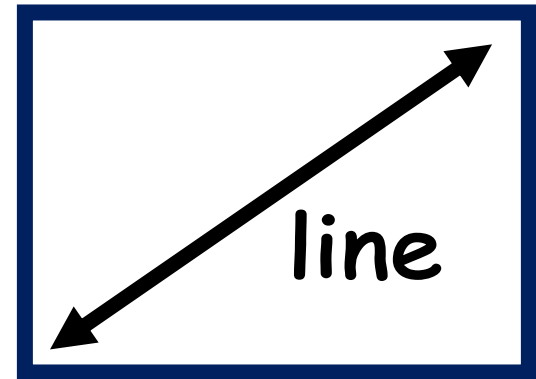
# likely event

Line

Question: What is a line?

Answer: A line is a thin, straight mark that extends in both directions with no end.

Gesture: Hold both of your arms stretched out left to right with your palms facing the floor.

Examples: Have your students design a map of an imaginary city that includes several different kinds of lines, angles and triangles. It must include the following: two sets of streets that are parallel, two sets of streets that are perpendicular, one street that intersects another streets to form an obtuse angle, one street intersects another to form an acute angle, one street that is a line segment, one street that is a line, one street that is a ray, a school in the shape of an equilateral triangle, and a park that is in the shape of a trapezoid.
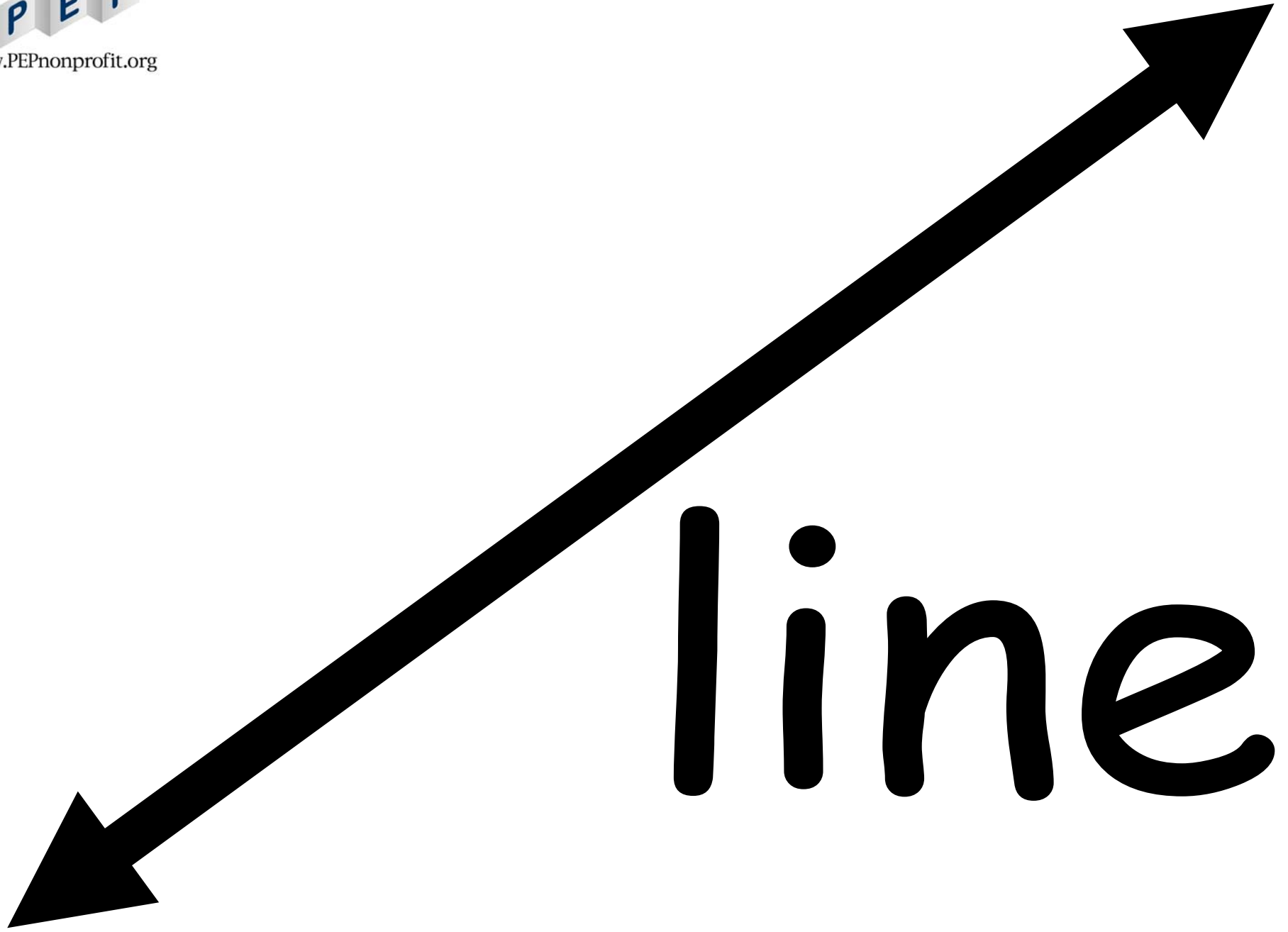
line

Line Graph
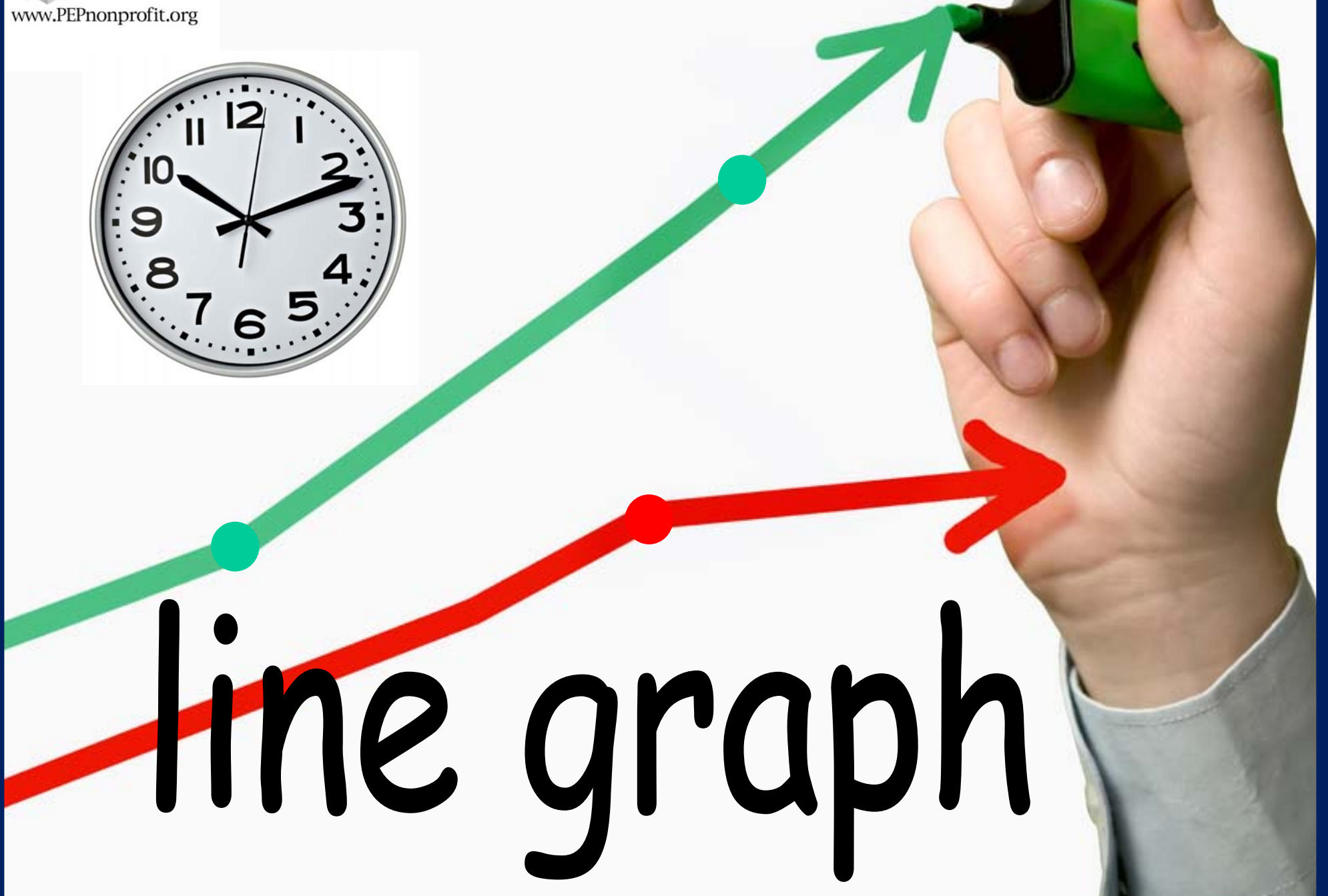

line graph

Question: What is a line graph?

Answer: A line graph is a graph that uses line segments to connect data points and shows changes to data over time.

Gesture: Draw a line graph in the air by making points and connect the dots. Then pretend to look at your watch (changes over time).

Examples: Ask a few questions to the class. Would we use a line graph to show how many people like pizza, how much it rained each month, and how many people live in our city? Let students come up with different scenarios where a line graph would be used.
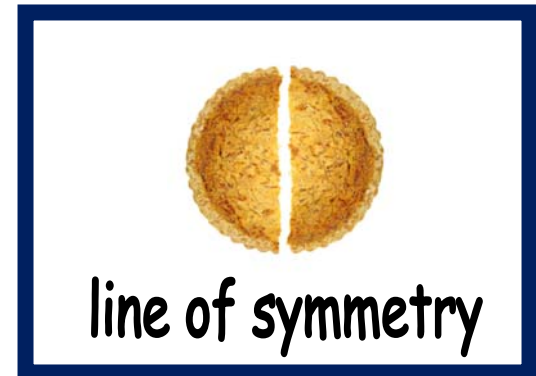
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line graph

Line of Symmetry

line of symmetry

Question: What is a line of symmetry?

Answer: A line of symmetry is a line that divides a figure into two congruent parts.

Gesture: With one hand form a C. With the other hand form a backwards C. Hold your two hands together and then separate to show they are congruent parts.

Examples: Have your students determine how many of the upper case and lower case letters in the alphabet could have a line of symmetry drawn through them. Some correct answers are A, B, C, c, D, E, H, I, ect…..
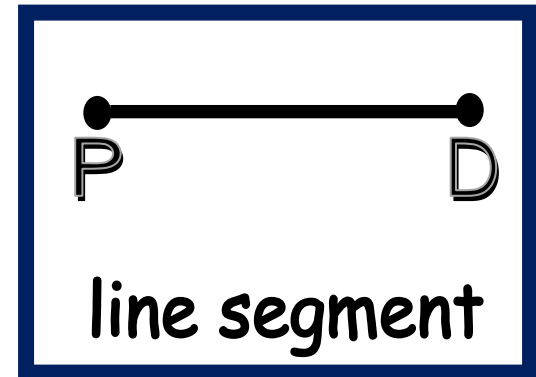
line of symmetry

Line Segment

line segment

Question: What is a line segment?

Answer: A line segment is part of a line that has fixed endpoints and contains all of the points between the two endpoints.

Gesture: Hold both of your arms stretched out left to right with your hands in fists (end points).

Examples: Have your students design a map of an imaginary city that includes several different kinds of lines, angles and triangles. It must include the following: two sets of streets that are parallel, two sets of streets that are perpendicular, one street that intersects another streets to form an obtuse angle, one street intersects another to form an acute angle, one street that is a line segment, one street that is a line, one street that is a ray, a school in the shape of an equilateral triangle, and a park that is in the shape of a trapezoid.

P   D

line segment

Liter

liter

Question: What is a liter?

Answer: A liter is a metric unit used to measure liquids and is equal to 1,000 milliliters.

Gesture: Pretend to shake a soda container (2 liter shown in image) and then twist off the top (sound effect of fizzing optional).

Examples: Start with a joke. What did the alien from planet Metric say when he arrived to earth? "Take me to your LITER!"

Allow students the opportunity to brainstorm things that they have seen that are measured in meters. The soda bottle on the image of this learning brick is 2 liters, do stores sell bottles of drinks in smaller sizes? Bigger? Have the kids look at things in their cupboards when they get home to see if they can find any other items that has the term liter referenced on it.

liter