

THE LEARNING WALL

P

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 **34** Concept Learning Bricks from the P section. Please refer to The Learning Wall Introduction and Explanation at www.PEPnonprofit.org for details on how to implement these items in your classroom.

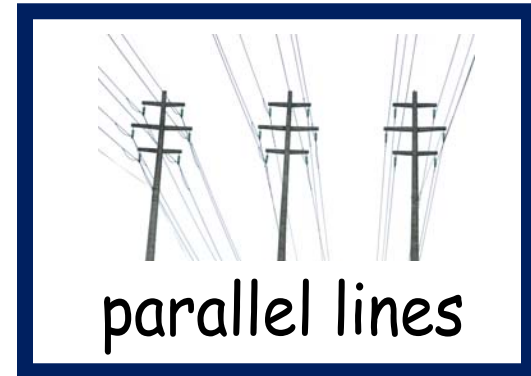
Pp

parallel lines, parallelogram, parenthesis, penny, pentagon, percent, perimeter, perpendicular lines, pi, pictograph, pint, place value 1s, place value 10s, place value 100s, place value 1,000s, place value 10,000s, place value 100,000s, place value 1,000,000s, place value 10,000,000s, place value 100,000,000s, place value 1,000,000,000s, place value 10,000,000,000s, place value 100,000,000,000s, plane figure, plot, polygon, positive number, pound, prime factorization, prime number, probability, product, protractor, pyramid



Parallel Lines

Question: What are parallel lines?



Answer: Parallel lines are two lines that will never cross and are always the same distance apart.

Gesture: Hold both arms out in front of you like parallel 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.

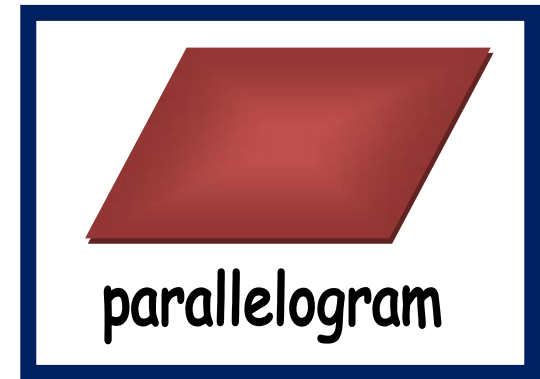


parallel lines



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Parallelogram

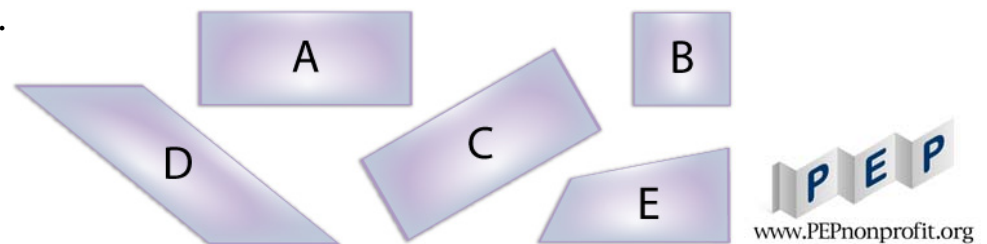


Question: What is a parallelogram?

Answer: A parallelogram is a 4-sided flat shape with straight sides where opposite sides are parallel

Gesture: Hold both arms up at an angle and parallel to one another. Then hold arms horizontal to the ground and parallel to one another.

Examples: Draw five shapes on the board (see example below). Have students discuss the similarities and differences between the five. Finally have the students determine which shape doesn't belong in the group and prove why.





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parallelogram

Parenthesis

(first)

parenthesis

Question: How are parenthesis used for in a math problem?

Answer: Everything in parenthesis must be done first in a math problem

Gesture: Cup both of your hands (to look like parenthesis) and then hold up one finger (parenthesis is done first).

Examples: IF using the “Please Excuse My Dear Aunt Sally” memory cue, explain that in the order of operations, everything in the parenthesis is to be done first. Give students problems with parenthesis, but have them only focus on the parenthesis. $5 + 8(6 - 2)^2 \div 4$ Explain that if there were no parenthesis, we’d go to the E part of the memory cue.





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(first)

parenthesis

Penny

Question: What is a penny?



Answer: A penny is worth one cent. There are one hundred pennies in one dollar.

Gesture: Pinch your thumb and finger together, as if holding a penny, then hold up one finger to show it's worth one cent.

Examples: Show how one penny can be written 1¢ or $\$0.01$. 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, I have 5 coins. The total is $\$0.18$. What are my coins? Since we are working on pennies, you must include one penny in every money puzzle problem.



penny



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Pentagon

Question: What is a pentagon?



Answer: A pentagon is a five sided flat shape with straight lines.

Gesture: Draw a pentagon in the air and hold up five fingers (five sides).

Examples: Have students create illustrations of pentagons. Be sure to point out that they don't all look like the patch on the soccer ball. As long as their shapes match the definition, they can draw it. Do a gallery walk inside your classroom where students can see all of the other pentagons drawn and decide if any of them do not match the criteria for being a pentagon.



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pentagon

Percent

Question: What is a percent?



Answer: A percent is the number of parts out of a hundred of something.

Gesture: Hold your arms wide apart, then pretend to cut out a portion (move your hands to represent the percent cut out).

Examples: Using ads as a way to connect percent to real life situations, present a couple of questions. In a department store, a \$40 dress is marked, "Save 25%." What is the discount? What is the sale price of the dress? Allow students to work in pairs and see if they can determine the price of the dress.



percent

Perimeter

Question: What is perimeter?

Answer: Perimeter is the distance around a two dimensional shape.

Gesture: Draw a rectangle in the air and then hold your forearms like an addition sign (add all sides).

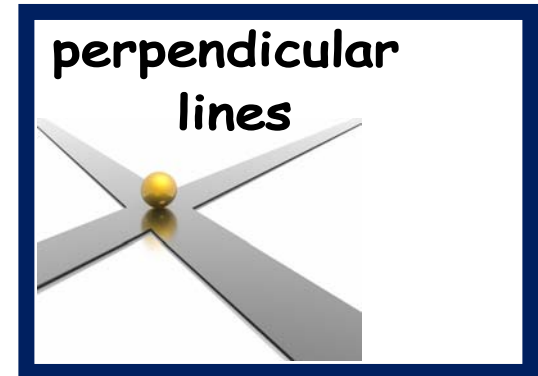
Examples: Have your students feel the difference between perimeter and area by having them close their eyes and use their touch to examine two cardboard polygons, one of which has pompons glued around the edge (perimeter) and the other which has pompons glued all over its surface (area). Once your students notice the difference between the two, have the class review polygon shapes. As each polygon appears have the class tell how many sides each polygon has and how to measure its perimeter. Explain that perimeter can be measured using different units, depending upon the size of the polygon. Examples: inch, centimeter, yards, miles, etc.



perimeter



Perpendicular Lines



Question: What are perpendicular lines?

Answer: Perpendicular lines are lines that are at right angles (90 degrees) to each other.

Gesture: Hold your arms out in front of you and cross them like perpendicular lines.

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.

perpendicular lines



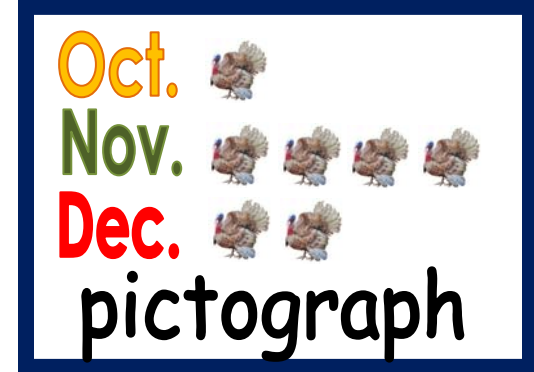


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3.14159265358979
3.14159265358979
pi

Pictograph

Question: What is a pictograph?



Answer: A pictograph uses pictures or symbols to represent an assigned amount of data.

Gesture: Hold up five fingers and then pretend to draw five of something (circles, chickens, etc)

Examples: Create a survey together about students' favorite fruit. Record their answers on the board using a tally chart. Then use the data in the tally chart to create a pictograph. To challenge students, have each symbol in the graph stand for more than one vote, such as two or three. Display the pictograph in the classroom. If possible, serve the fruit that gets the most votes.

Oct.



Nov.



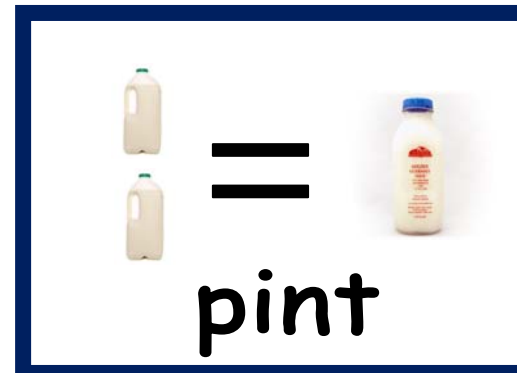
Dec.



pictograph

Pint

Question: What is a pint?



Answer: A pint measures 16 fluid ounces. When measuring a liquid, there are 2 pints in a quart and 8 pints in a gallon.

Gesture: Touching your forearm (wrist to elbow) call that one pint. Touching your bicep (elbow to shoulder) call that a second pint. Then straighten you arm as you show two pints are in one quart (straight arm is the gesture for quart).

Examples: Show a pint measure and explain that a pint is a unit of measurement that is larger than a cup. Ask a student to pour 2 cups into the pint measure to demonstrate that 2 cups are equal to 1 pint. Explain that we use the abbreviation "pt" to stand for pints. Brainstorm different items that come in pint sizes, such as ice cream, milk, and blueberries.



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=



paint

Place Values 1s

Question: What is the 1s place value?

378,594
TH
place value: 1s

Answer: The 1s place value is the first number from the right.

Gesture: Hold up three fingers and waggle the third finger as you say ones.

Examples: Take 10 separate pieces of paper and label them each from 0 to 9. Then give a student one, two, or three 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. Write the number on the board and have students say the number out loud and model the number using manipulatives. Have students take turn throwing bean bags.

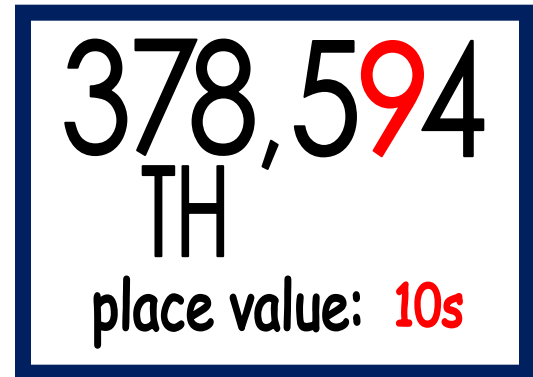
378,594

TH

place value: 1s

Place Value 10s

Question: What is the 10s place value?



The diagram shows the number 378,594. The digit 9 is highlighted in red. Below the number, the label "TH" is centered under the 9. Below "TH", the text "place value: 10s" is written, with "10s" in red.

Answer: The 10s place value is the second number from the right.

Gesture: Hold up three fingers and waggle the second finger as you say tens.

Examples: Take 10 separate pieces of paper and label them each from 0 to 9. Then give a student one, two, or three 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. Write the number on the board and have students say the number out loud and model the number using manipulatives. Have students take turn throwing bean bags.





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378,594

TH

place value: 10s

Place Value 100s

Question: What is the 100s place value?

378,594
TH
place value: 100s

Answer: The 100s place value is the third number from the right.

Gesture: Hold up three fingers and waggle the first finger as you say hundreds.

Examples: Take 10 separate pieces of paper and label them each from 0 to 9. Then give a student one, two, or three 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. Write the number on the board and have students say the number out loud and model the number using manipulatives. Have students take turn throwing bean bags.



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378,594
TH

place value: 100s

Place Value 1,000s

Question: What is the 1,000s place?



378,594
TH
place value: 1,000s

Answer: The 1,000s place value is the first number after the first comma from the right.

Gesture: Make a comma in the air (thousands), then hold up three fingers and waggle the third finger as you say ones.

Examples: Play “Make it Texas Size!” or “Make it Rhode Island Size!” from our Acing Math: One Deck at a Time download at www.PEPnonprofit.org All you need is a deck of cards and some scratch paper. You can create your game boards to be as big as you like depending on the place value you are working on.

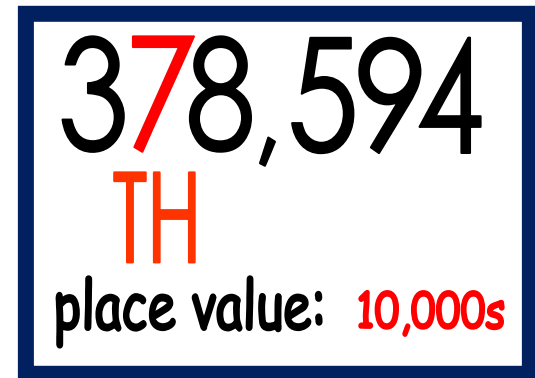
378,594

TH

place value: 1,000s

Place Value 10,000s

Question: What is the 10,000s place?



Answer: The 10,000s place value is the second number after the first comma from the right.

Gesture: Make a comma in the air (thousands), then hold up three fingers and waggle the second finger as you say tens.

Examples: Play “Make it Texas Size!” or “Make it Rhode Island Size!” from our Acing Math: One Deck at a Time download at www.PEPnonprofit.org All you need is a deck of cards and some scratch paper. You can create your game boards to be as big as you like depending on the place value you are working on.



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378,594
TH

place value: 10,000s

Place Value 100,000s

Question: What is the 100,000s place value?



Answer: The 100,000s place value is the third number after the first comma from the right.

Gesture: Make a comma in the air (thousands), then hold up three fingers and waggle the first finger as you say hundreds.

Examples: Play “Make it Texas Size!” or “Make it Rhode Island Size!” from our Acing Math: One Deck at a Time download at www.PEPnonprofit.org All you need is a deck of cards and some scratch paper. You can create your game boards to be as big as you like depending on the place value you are working on.



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378,594

TH

place value: 100,000s

Place Value 1 millions

612,378,594
M TH

place value: 1 millions

Question: What is the 1 millions place value?

Answer: The 1 millions place value is the first number after the second comma from the right.

Gesture: Make two commas in the air (millions), then hold up three fingers and waggle the third finger as you say ones.

Examples: Write various numbers on the board. Have the students read and identify various place values to the millions. Example: Write 2,365,476 on the board. Ask the students what is the value of the 5. What is the value of the 2? Tell the students to create a number that has a seven in the ten thousands place. The students can use any number they choose to complete the chart.



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612, 378, 594
M TH

place value: 1 millions

Place Value 10 millions

Question: What is the 10 millions place value?

612,378,594
M TH
place value: 10 millions

Answer: The 10 millions place value is the second number after the second comma from the right.

Gesture: Make two commas in the air (millions), then hold up three fingers and waggle the second finger as you say tens.

Examples: Write various numbers on the board. Have the students read and identify various place values to the millions. Example: Write 2,365,476 on the board. Ask the students what is the value of the 5. What is the value of the 2? Tell the students to create a number that has a seven in the ten thousands place. The students can use any number they choose to complete the chart.



www.PEPnonprofit.org

612,378,594
M TH

place value: 10 millions

Place Value 100 Millions

612,378,594
M TH
place value: 100 millions

Question: What is the 100 millions place value?

Answer: The 100 millions place value is the third number after the second comma from the right.

Gesture: Make two commas in the air (millions), then hold up three fingers and waggle the first finger as you say hundreds.

Examples: Write various numbers on the board. Have the students read and identify various place values to the millions. Example: Write 2,365,476 on the board. Ask the students what is the value of the 5. What is the value of the 2? Tell the students to create a number that has a seven in the ten thousands place. The students can use any number they choose to complete the chart.



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612,378,594

M

TH

place value: 100 millions

Place Value 1 Billions

897,612,378,594
B M TH

place value: 1 billions

Question: What is the 1 billions place value?

Answer: The 1 billions place value is the first number after the third comma from the right.

Gesture: Make three commas in the air (billions), then hold up three fingers and waggle the third finger as you say ones.

Examples: Using construction paper, have students create their own number spanning from one billion to 999 billion. Once they have created their numbers, collect all of the cards and shuffle them up. Redistribute the cards randomly to students. When you say go, have students find two other students and have them line up smallest to biggest by holding up their papers for you to check for understanding. When you say go, have the students find a new group of three and do the same thing. You can also mix up and have them go biggest to smallest, or have them find people who have the same number in a certain billion place value. Options are endless.



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897,612,378,594

B

M

TH

place value: 1 billions

Place Value 10 Billions

897,612,378,594
B M TH

place value: 10 billions

Question: What is the 10 billions place value?

Answer: The 10 billions place value is the second number after the third comma from the right.

Gesture: Make three commas in the air (billions), then hold up three fingers and waggle the second finger as you say tens.

Examples: Using construction paper, have students create their own number spanning from one billion to 999 billion. Once they have created their numbers, collect all of the cards and shuffle them up. Redistribute the cards randomly to students. When you say go, have students find two other students and have them line up smallest to biggest by holding up their papers for you to check for understanding. When you say go, have the students find a new group of three and do the same thing. You can also mix up and have them go biggest to smallest, or have them find people who have the same number in a certain billion place value. Options are endless.



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897,612,378,594

B

M

TH

place value: 10 billions

Place Value 100 Billions

897,612,378,594
B M TH

place value: 100 billions

Question: What is the 100 billions place value?

Answer: The 100 billions place value is the third number after the third comma from the right.

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897,612,378,594

B

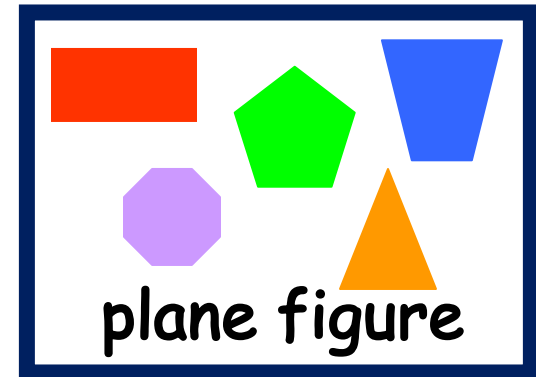
M

TH

place value: 100 billions

Plane Figure

Question: What is a plane figure?



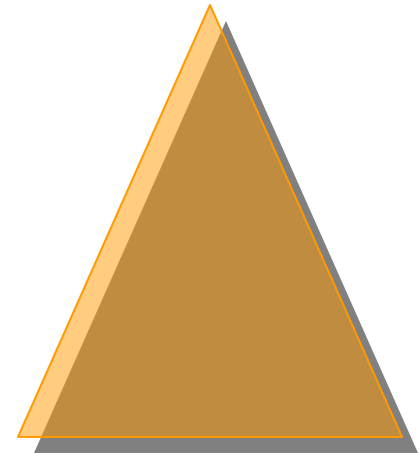
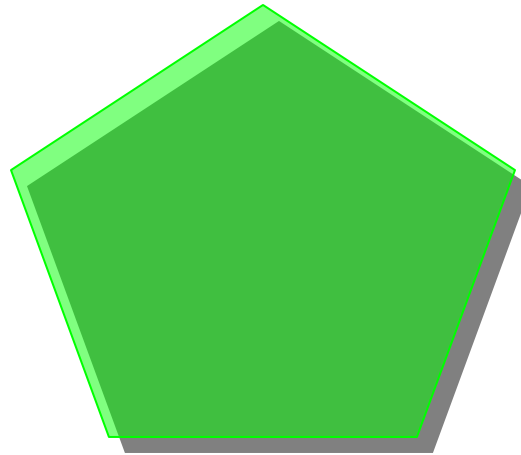
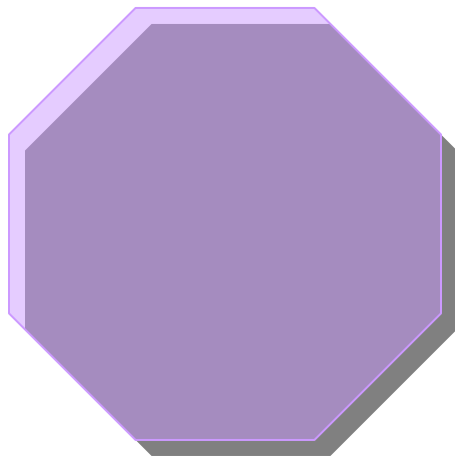
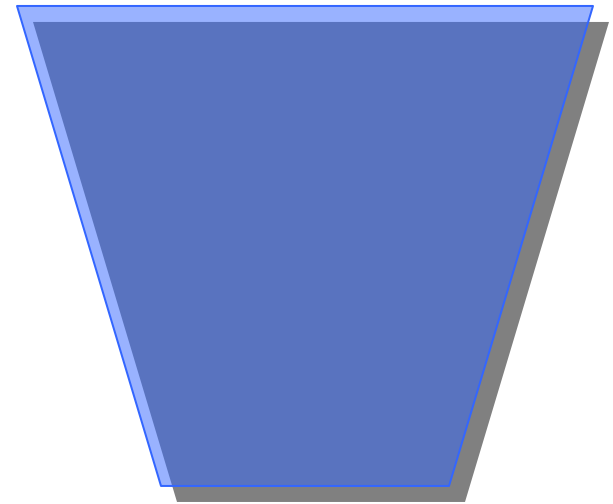
Answer: A plane figure is a geometric shape with a flat surface.

Gesture: Draw a shape in the air and then hold your hand flat (to show flat surface).

Examples: Have students go on a scavenger hunt for shapes around the school. Divide the students into small groups and give each group a list of different-shaped items to find. Groups can write where they find each item or if possible, bring the item along.



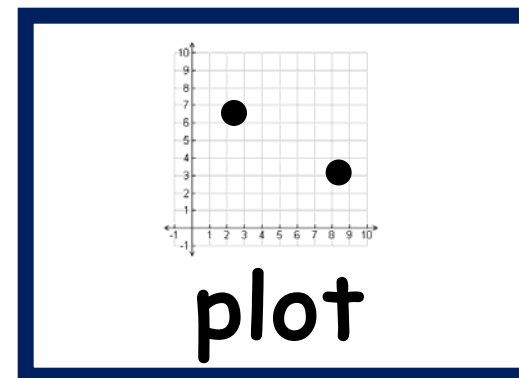
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plane figure

Plot

Question: What does it mean to plot?



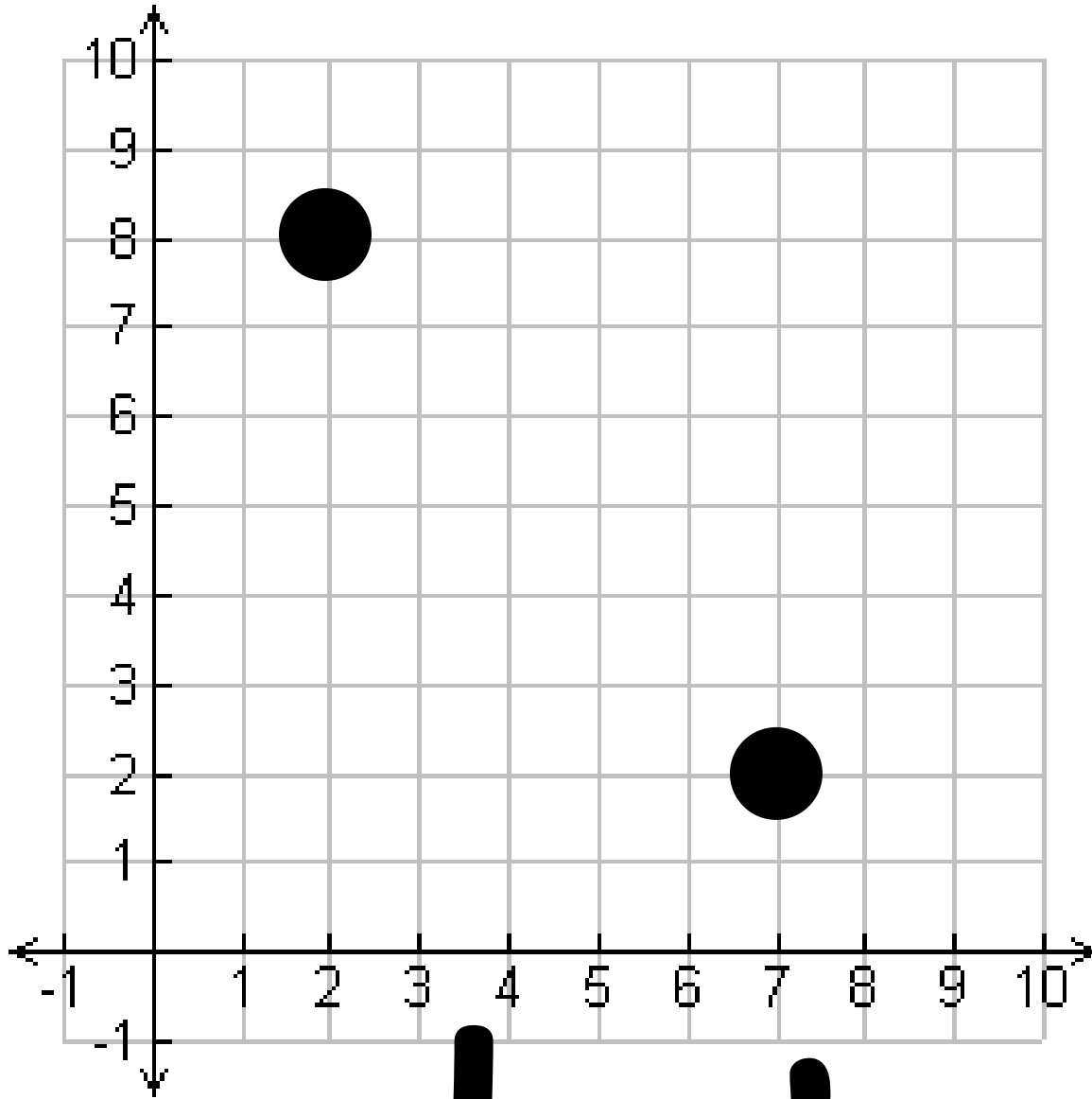
Answer: To plot means to draw on a map or graph.

Gesture: Hold five fingers up and then hold your arms horizontal to the ground (x axis). Hold up two fingers and then point up and down (y axis). Pretend to plot a point at (5,2) and hold up your fist.

Examples: Go to www.PEPnonprofit.org and download **Coordinate Fours**. It is a game designed to reinforce plotting points on all four quadrants of a coordinate plane.



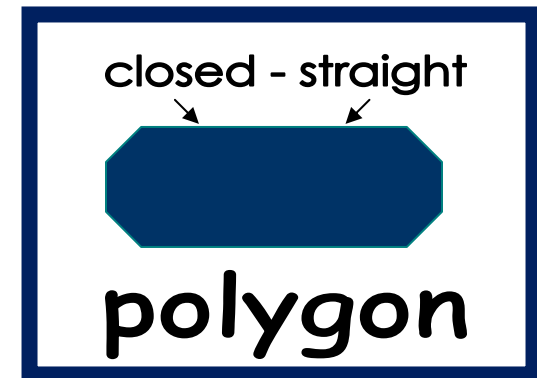
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plot

Polygon

Question: What is a polygon?



Answer: A polygon is a 2-Dimensional, closed shaped with straight lines.

Gesture: Hold up two fingers (2-Dimensional), draw a straight line with your finger, and pretend to close a door (closed shape).

Examples: Lead students into a discussion on the importance of naming polygons with special names. Discuss how we don't just say, "Hey Girl" or "Hey Boy", but that each person has a special name. Discuss the special names of polygons to include: square, rectangle, trapezoid, triangles (obtuse, right, acute), rhombus, parallelogram, etc. Have students look around the room and try to identify any of the polygons discussed.

closed - straight

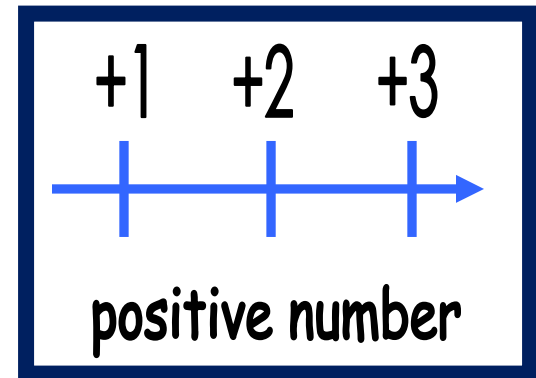


polygon



Positive Number

Question: What is a positive number?



Answer: A positive number is a quantity greater than zero.

Gesture: Hold up one finger in front of you, then two fingers a little higher than the one, then three fingers a little higher than the two, etc....

Examples: Ask the questions, “What are positive numbers?” and “What are negative numbers?” Write student responses on the board. Use the negative symbol (-) when writing student examples that are negative and (+) for positive. This introduces the symbol to the students right away. You are looking for students to have a general understanding that positive numbers indicate a gain of some kind (could be football yards or temperature), and that negative numbers indicate a loss or decrease (temperature again “below zero” or football penalty- loss of yards). Allow students to create situations that dictate if the result would be positive or negative.

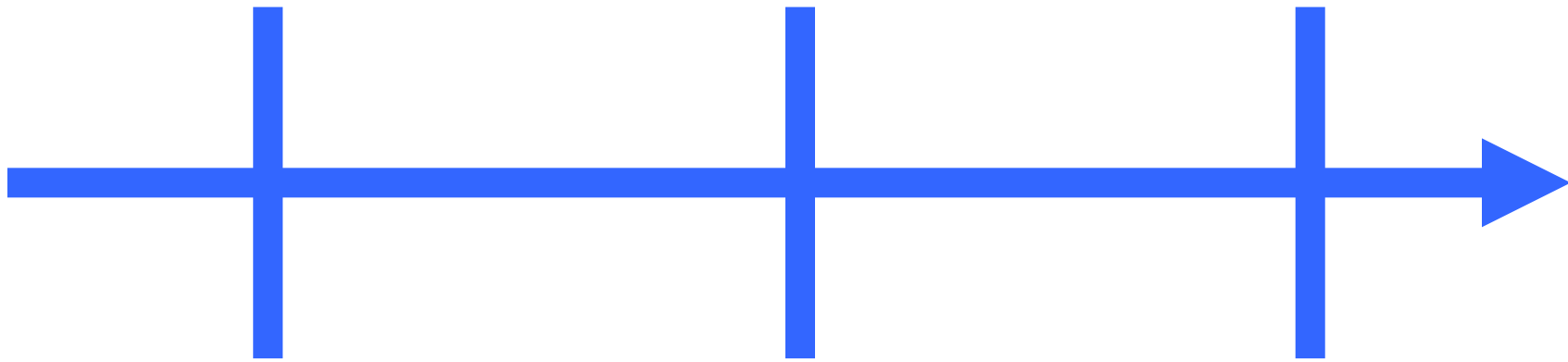


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+1

+2

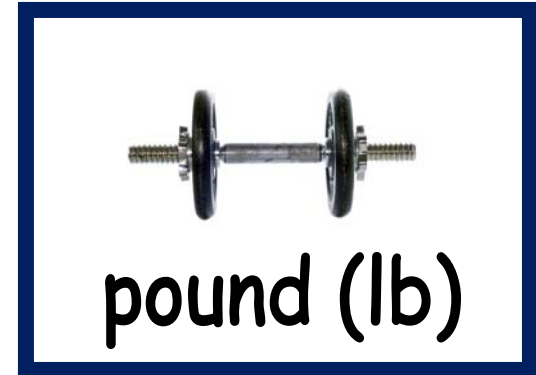
+3



positive number

Pound

Question: What is a pound?



Answer: A pound is abbreviated by lb and is equal to sixteen ounces.

Gesture: Pretend to lift a dumbbell to represent a pound.

Examples: Have a student present an object to the class. Then have other students find examples of objects that are lighter or heavier than the object. Students can use a scale to measure the exact weight and compare. If possible they can subtract to find the difference in weight. Then challenge students to find objects that weigh about the same.



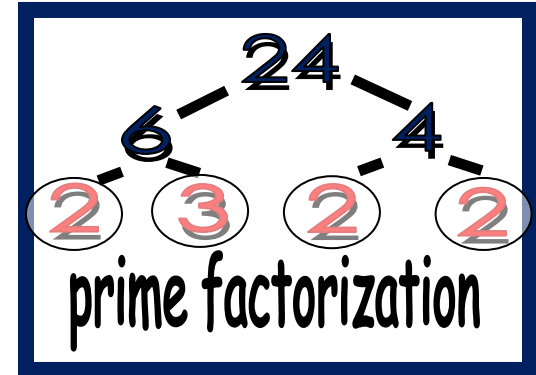
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pound (lb)

Prime Factorization

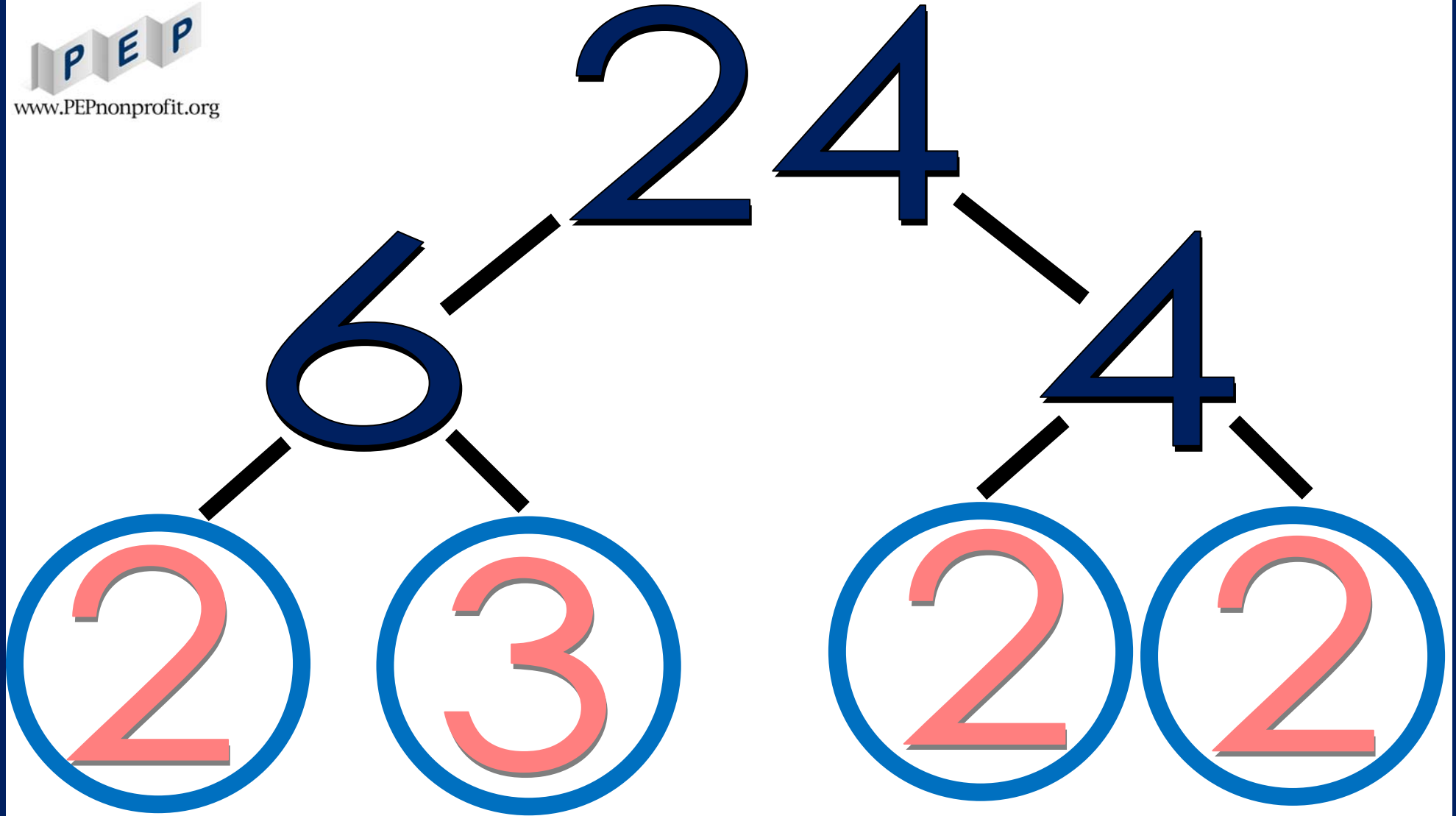
Question: What is prime factorization?



Answer: Prime factorization is finding the factors of a number that are all prime.

Gesture: Sweep your hands across the front of yourself (to show all of the factors becoming prime). Then hold one hand out as a fist (the fist will represent a prime number) and the other hand hold up two fingers (to show it only has two factors).

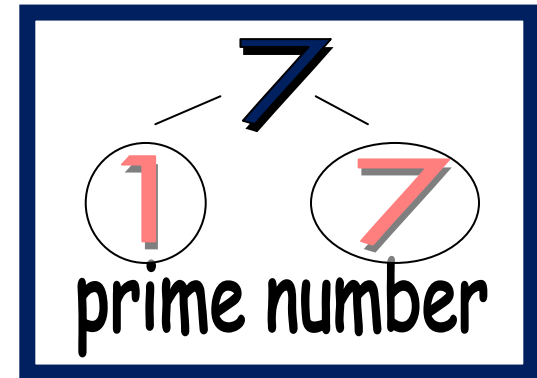
Examples: Go to www.PEPnonprofit.org and download **Prime and Composite Lines**. It is a game designed to reinforce both composite and prime numbers. To add the piece of prime factorization, for any number they choose that is composite, have them create the prime factorization tree for that number before the next turn is taken.



prime factorization

Prime Number

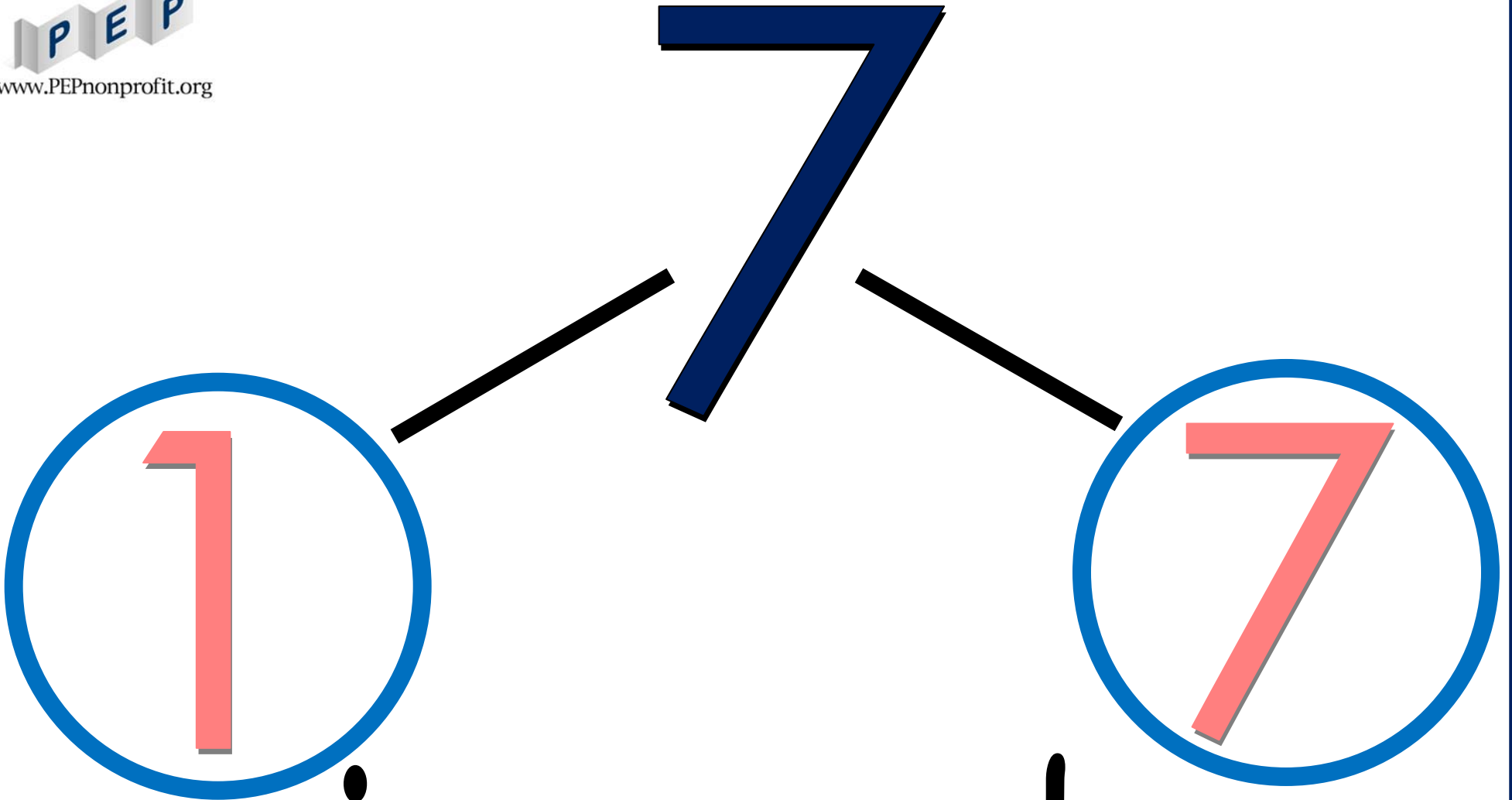
Question: What is a prime number?



Answer: A prime number can be divided evenly only by, or itself.

Gesture: Hold one hand out as a fist (the fist will represent a prime number) and the other hand hold up two fingers (to show it only has two factors).

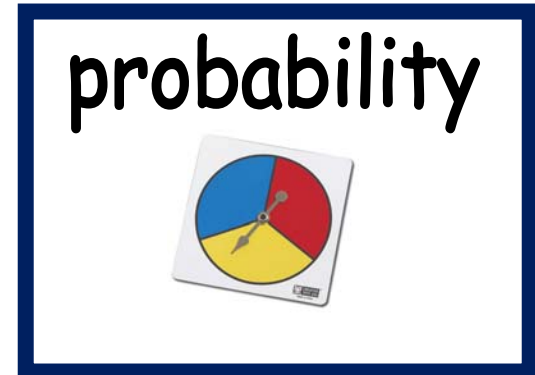
Examples: Go to www.PEPnonprofit.org and download **Prime and Composite Lines**. It is a game designed to reinforce both composite and prime numbers.



prime number

Probability

Question: What is probability?

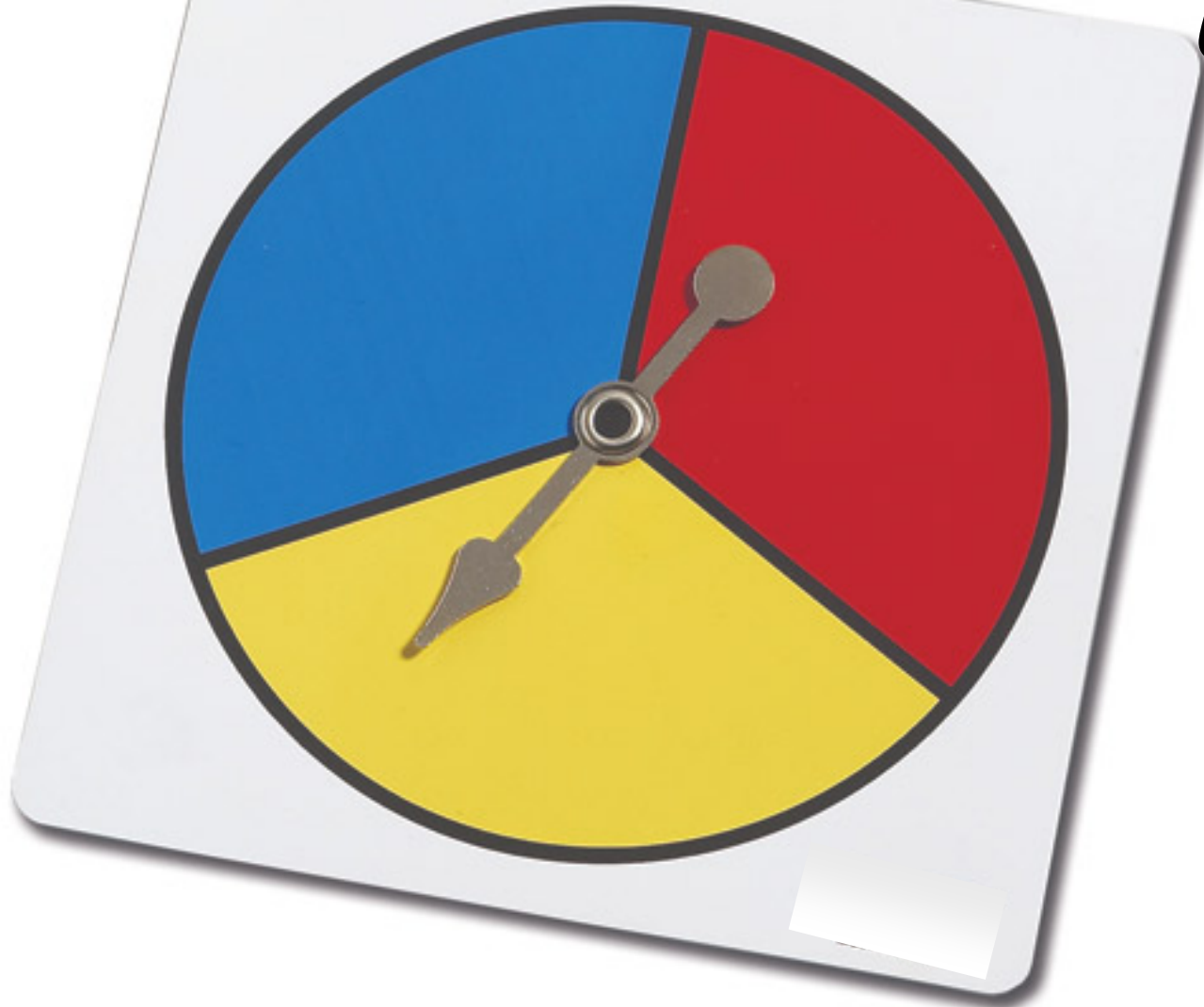


Answer: Probability is the chance something will happen.

Gesture: Spin your arm around as if it was the arm of a probability spinner.

Examples: For an activity other than using spinners, put two different colors of M&Ms in a bag (2 of one color and 8 of another color to start out). Ask the students which color would most likely be pulled out/which color would most likely not be pulled out? Reach in the bag 10 times and use tally marks to record your observation. Then talk about why or why not their tally chart matched their prediction. Ask the question what will happen if we add more of the color that is fewer. Do this several times. This will help the students see that probability depends on different variables.

probability



Product



Question: What is a product?

Answer: A product is the answer in a multiplication problem.

Gesture: Cross your arms to form a multiplication sign.

Examples: Give your students some products on the board. They have to determine some possible factors to get the given product.

product factors

$$10 = 5 \times 2$$

$$50 =$$

$$24 =$$

product factors

$$12 =$$

$$22 =$$

$$110 =$$

product factors

$$94 =$$

$$121 =$$

$$40 =$$



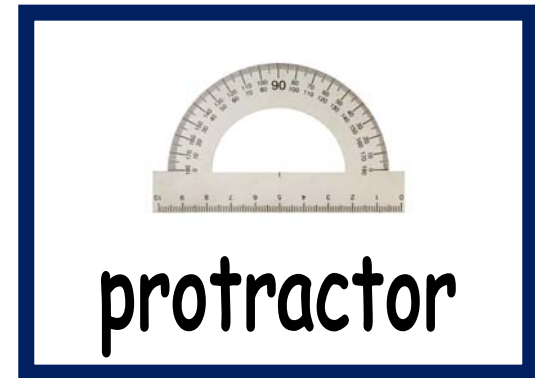
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answer

product

Protractor

Question: What is a protractor?



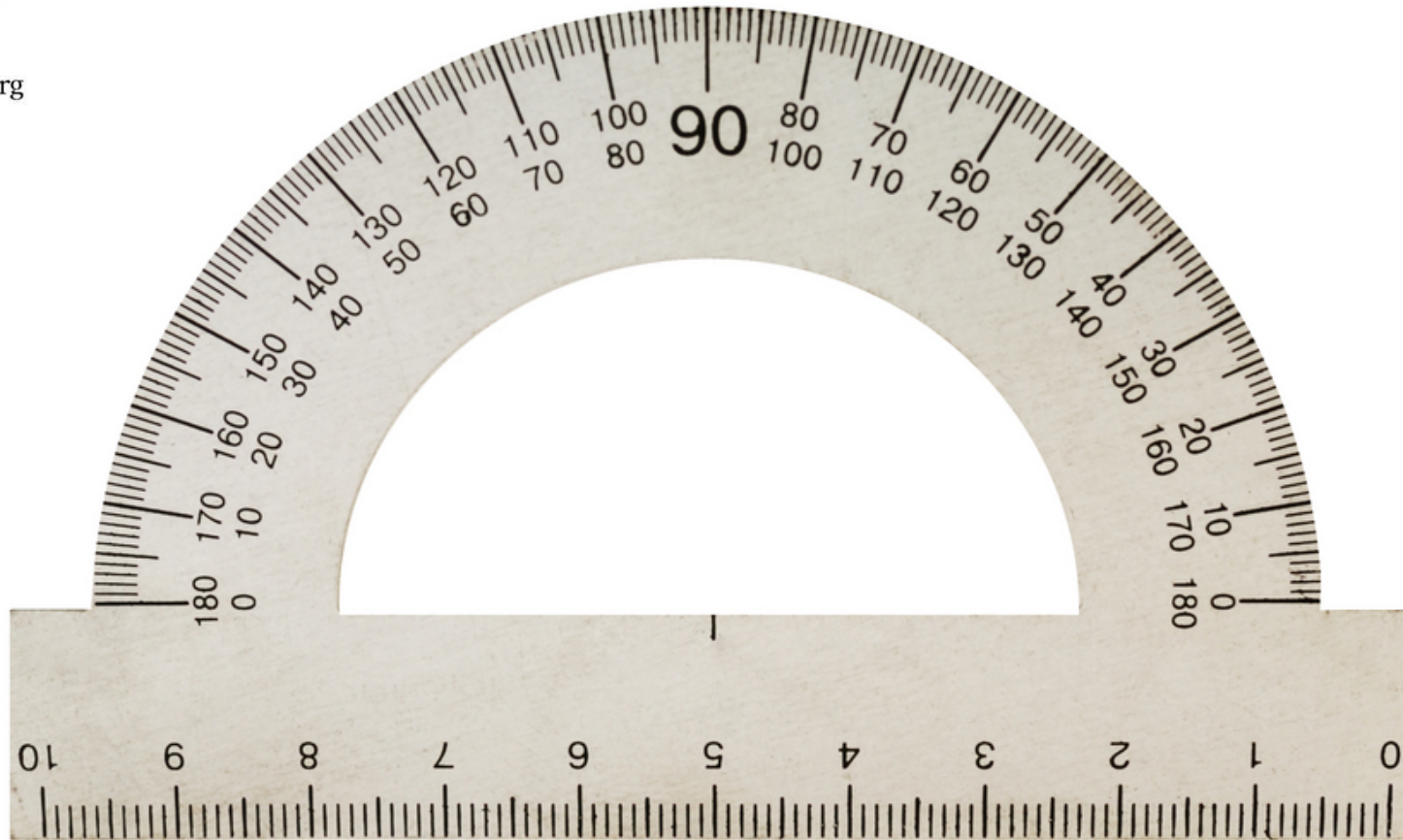
Answer: A protractor is an instrument used in measuring or drawing angles.

Gesture: Draw a straight line and then connect the two end points with a half circle to form a protractor. Then hold your two arms out to form an angle (right, acute, or obtuse).

Examples: As you show the class a protractor, ask them, “What is this used for?” After fielding a few answers, proceed to different types of angles. Ask the question, “How do people use angles in everyday life?” For example, carpenters use angles to construct buildings, skateboarders use angles to make their ramps, cars have to be parked at certain angles to fit into their spaces, and a person playing pool has to figure out the correct angle in order to get the ball in a pocket. After your discussion of the uses of angles and a protractor, give your students a protractor and two popsicle sticks. Students will utilize popsicle sticks to create a variety of angles, then use a protractor to measure the angles they create.



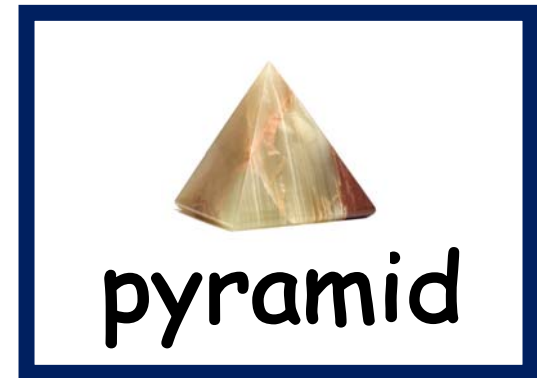
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protractor

Pyramid

Question: What is a pyramid?



Answer: A pyramid is a solid object with a flat base and the sides are triangles that meet at the top.

Gesture: Hold your hand out flat to show that a pyramid has a flat base, then draw a few triangles and tap the top of each one to show they meet at the top.

Examples: Using toothpicks and marshmallows have your students construct pyramids with different bases.





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pyramid