

# THE LEARNING WALL

## T - Z

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 **23** Concept Learning Bricks from the T - Z sections. Please refer to The Learning Wall Introduction and Explanation at [www.PEPnonprofit.org](http://www.PEPnonprofit.org) for details on how to implement these items in your classroom.

Tt

tenth, transformation, translation,  
trapezoid, triangle

Uu

unit, unlikely, unlike  
denominators

Vv

variable, vertex, vertical,  
volume

Ww

week, word form

Xx

x-axis, x-coordinate

Yy

y-axis, y-coordinate,  
yard, year

Zz

zero – product property

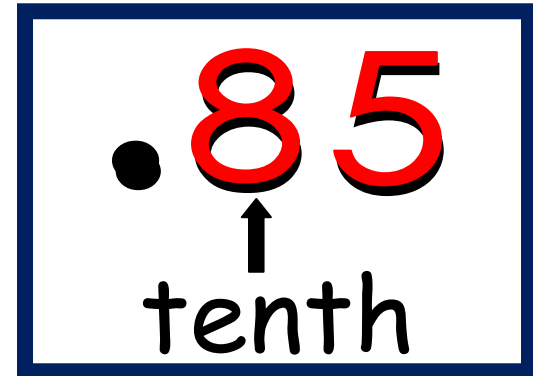
#s

180 degrees for triangle,  
360 degrees for circle



# Tenth

**Question:** What is a tenth?



**Answer:** A tenth is one out of ten equal parts. It is also the first number after a decimal point.

**Gesture:** Punch a decimal point, then hold up one finger to represent the tenths spot.

**Examples:** Take 10 separate pieces of paper and label them each from 0 to 9. Give a student 1 bean bag to throw at different numbers to create a number. For example, if a student throws a bag on a 2, he or she forms the number 2. Next have the class decide what that number would be if it were out of ten. How do we write 2 tenths?



[www.PEPnonprofit.org](http://www.PEPnonprofit.org)

• 85

↑  
tenth

# Transformation

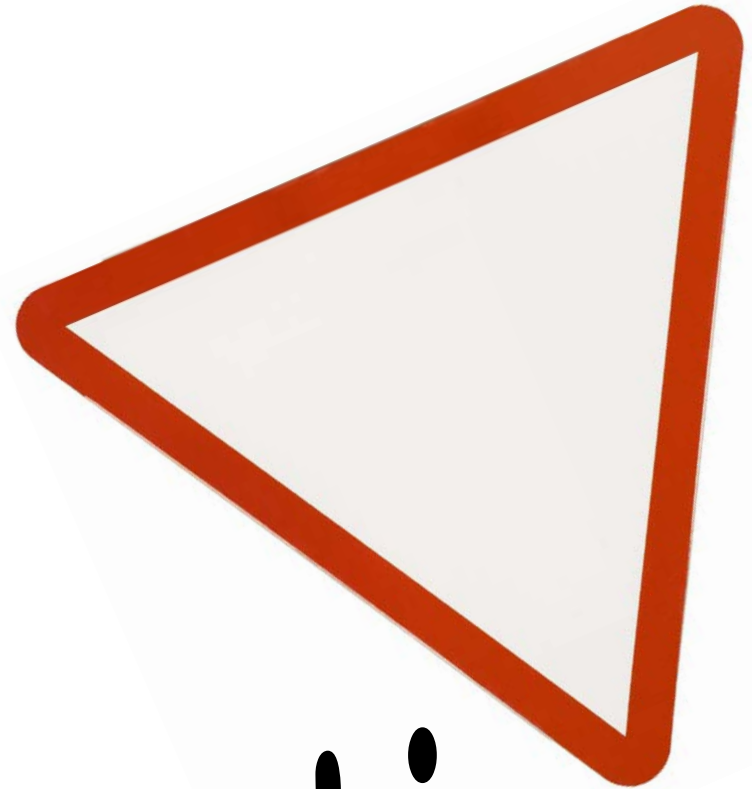
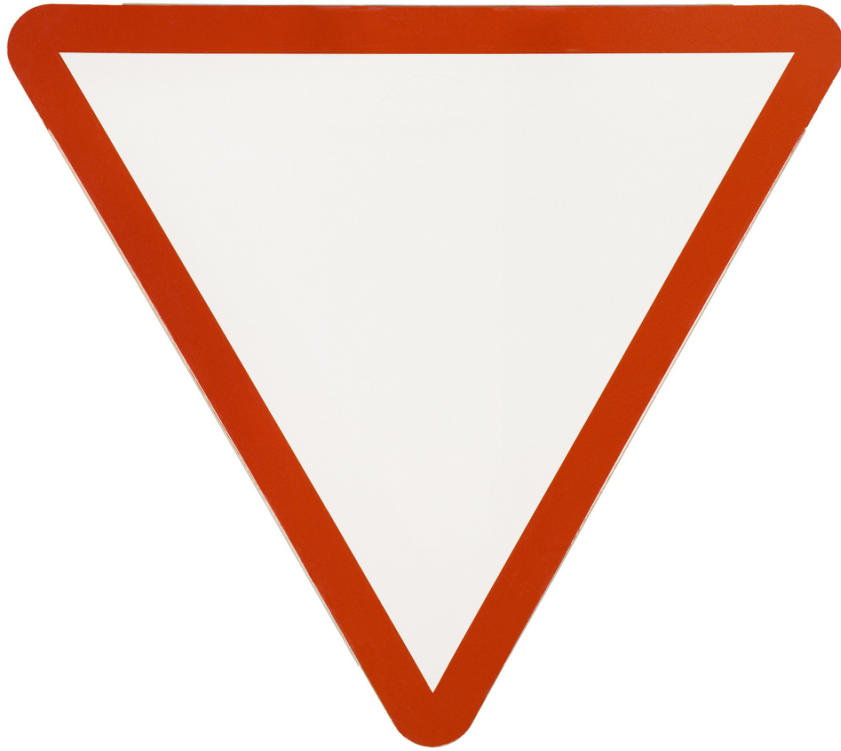
**Question:** What is a transformation?



**Answer:** A transformation is when you move a shape so that it is in a different position, but still has the same size, area, angles and line lengths.

**Gesture:** Create a triangle with your fingers (from both hands). Move the triangle in different positions, but have it maintain its shape and size.

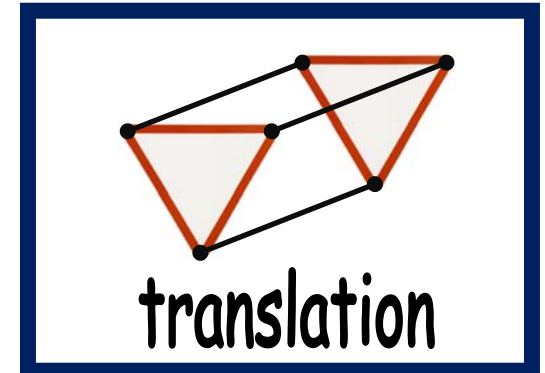
**Examples:** Give your students different geometric shapes (square, triangle, rhombus, trapezoid, rectangle). Have them place one shape on top of their desks. Next, allow students to switch desks with another student. Students are aloud to turn, flip, rotate, slide their partners shape as much as they like until you stay stop. When you say stop, have students go back to their original desk. Ask the following question: Even though your partner moved and manipulated your shape for 30 seconds, does it appear to be different in size, area, angles and line lengths? Give them some time to answer and the welcome them to the world of transformations!



transformation

# Translation

**Question:** What is a translation?



**Answer:** A translation is moving a figure to a new location with no other changes. Every point moves the same distance and same direction.

**Gesture:** Hold your hand out in front of you. Move it to another spot, but don't change position of your hand.

**Examples:** Develop a pattern that will allow each student to "translate" himself/herself to a new seat in the classroom. Place the translation directions on 3x5 cards. Ask students to move to their new positions under the given translation. Here are some sample translation card instructions: 1 desk right, 2 desks back. 1 desk right, 4 desks forward.

Draw out a translation grid of your classroom setting before you do this. That way every students will translate themselves to a different, unoccupied, desk.



[www.PEPnonprofit.org](http://www.PEPnonprofit.org)



# translation

# Trapezoid

**Question:** What is a trapezoid?



**Answer:** A trapezoid is a 4-sided flat shape with straight sides that has a pair of opposite sides parallel.

**Gesture:** Hold your arms parallel in front of your chest and belly button. Next draw two lines coming in at an angle to show they are not parallel.

**Examples:** Give each student a mini whiteboard, dry erase marker, and eraser. Give mathematical definitions of shapes you have discussed in class. For example, tell the kids you are thinking of a 4-sided flat shape with straight sides that has a pair of opposite sides parallel. Have the students draw the shape you described on their whiteboards and show when you call, “Ready. Set. Show!”

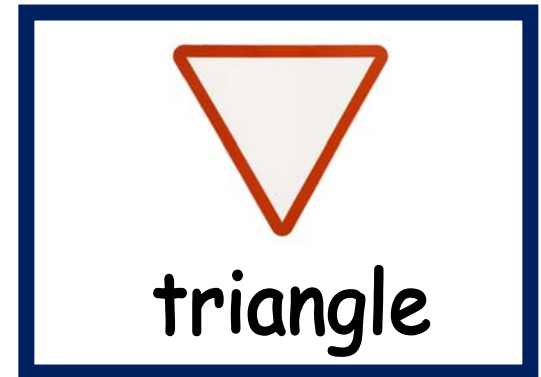




trapezoid

# Triangle

**Question:** What is a triangle?



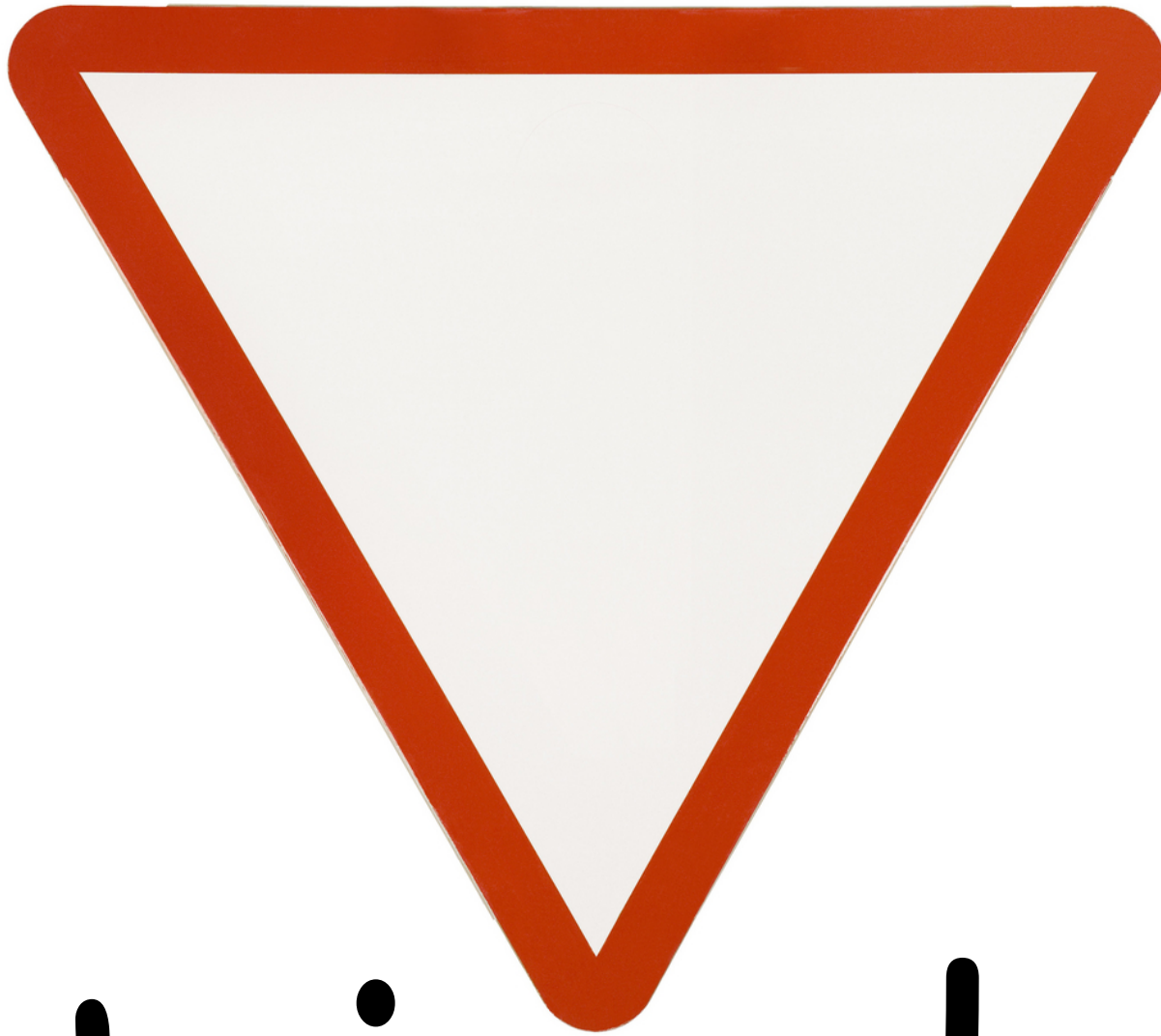
**Answer:** A triangle is a 3-sided flat shape with straight lines.

**Gesture:** Create a triangle with your fingers (from both hands).

**Examples:** Give students some pipe cleaners. Have them create three different types of triangles (scalene, isosceles, and equilateral). On your call, have them trade a triangle with another student, for example you could have them trade a scalene for a scalene. This will force them to use what they know about triangles when deciding which to give away and also evaluating if the triangle given to them is correct or not.



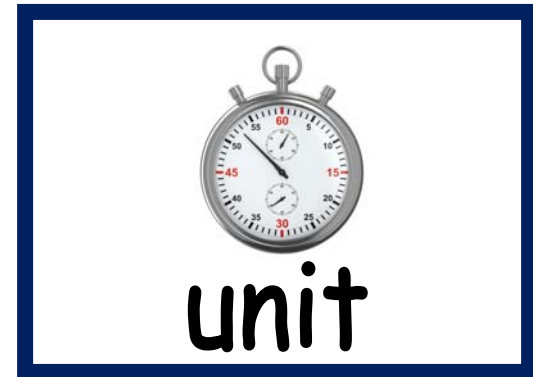
[www.PEPhonprofit.org](http://www.PEPhonprofit.org)



triangle

# Unit

**Question:** What is a unit?



**Answer:** A unit is the quantity used as a standard of measurement. For example, units of time are second, minute, hour, day, week, month, year and decade.

**Gesture:** Move your hand in a circle very quickly (second). Move your hand in a circle quickly, but slower than the second (minute). Move your hand in a circle at a medium pace (hour). Move your hand in a circle slowly (day). Move your hand in a circle very slowly (week). Move your hand in a circle painfully slowly (month). Move your hand in a circle agonizingly slowly (year). Move your hand in a circle so slow that it never completes the circle (decade).

**Examples:** Give students a baggie of pre-cut phrases, such as: sneeze, hold your breath, watch a movie, eat breakfast, lunch, and dinner, grass growing long enough to be needed to be cut, moon going through all of it's phases, a birthday, and kindergarten to tenth grade. Have students sort the list of items from a second to a decade.



unit

# Unlikely Event

**Question:** What is an unlikely event?



**Answer:** An unlikely event does not have a very good chance of happening, but is not impossible. It is unlikely to pull a red marble from a group of 12 blue marbles and 1 red marble.

**Gesture:** Nod your head side to side as to indicate NO 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 if they think the student will win if you and the student race across the classroom. Now move yourself to the middle of the room....it is unlikely the student will win the race if you have such a large head start, but it is not impossible!



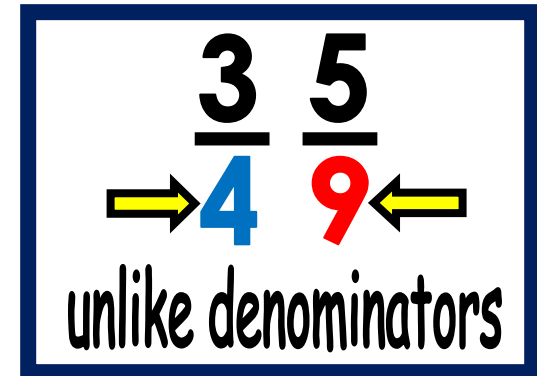
[www.PEPnonprofit.org](http://www.PEPnonprofit.org)

unlikely



event

# Unlike Denominators



**Question:** What are unlike denominators?

**Answer:** Unlike denominators are fractions that have different denominators. In order to add and subtract fractions with unlike denominators it is important to make them like.

**Gesture:** Hold up four fingers (down low to represent the denominator). Hold up nine fingers (down low to represent the denominator). Finally, shake a finger meaning no to show that the denominators are not alike.

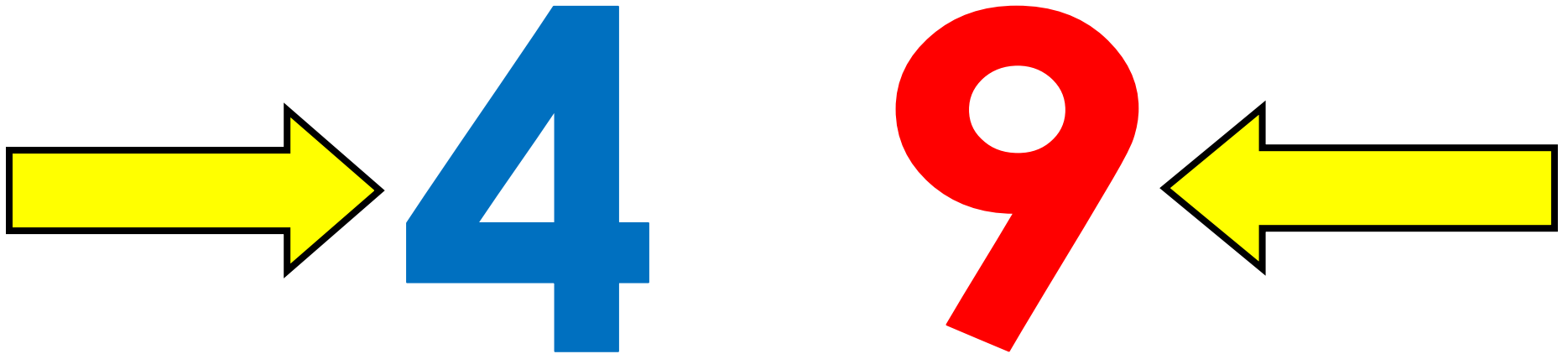
**Examples:**  $\frac{1}{2} + \frac{1}{3}$  The main rule is that you can't do anything until the denominators are the same! Find the least common denominator (LCD)... It's really just the LCM of the denominators, 2 and 3. The LCM of 2 and 3 is 6, therefore the LCD is 6. This first part is just getting the students to see how to get like denominators and the importance of doing so.





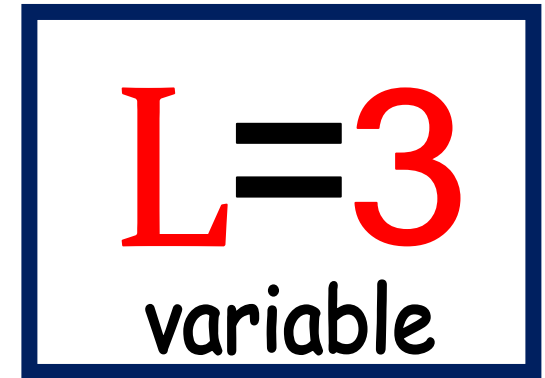
www.PEPnonprofit.org

$$\frac{3}{4} \quad \frac{5}{9}$$



unlike denominators

# Variable



**Question:** What is a variable?

**Answer:** A variable is a letter or symbol used to take the place of a number (usually not known).

**Gesture:** Make a L with one hand (not on your forehead). Hold both arms parallel to the ground (equal). Hold up three fingers.

**Examples:** Using Post-it-notes (both numbers and variables), write expressions. For example, you can make expressions such as  $2 + 3$  and  $8 - 1$  using the notes. Be sure to make more numbered Post-it-notes as needed. Turn the expressions into equations by adding equal signs and answers using new notes. For example, the expressions will now be  $2 + 3 = 5$  and  $8 - 1 = 7$ . Stick a variable Post-it-note over one of the numbers in each equation. For example, the equation  $2 + 3 = 5$  would now appear as  $2 + a = 5$  with the variable covering the note with the 3 on it. Have students “discover” the hidden numbers or variables.



[www.PEPnonprofit.org](http://www.PEPnonprofit.org)

**L = 3**

**variable**

# Vertex

**Question:** What is a vertex?



**Answer:** A vertex is a point where two more straight lines meet. A corner.

**Gesture:** Hold one arm flat and parallel to the ground. Hold the other arm vertical to the ground. Place your elbow of the vertical arm to the hand of the parallel arm. Where the elbow and hand meet is the vertex.

**Examples:** Give groups of students a closed box (cereal, cardboard, etc...). Have them identify all of the vertices on the rectangular prism by marking each vertex with a marker. Point out that when we have more than one vertex, that is called vertices.



[www.PEPnonprofit.org](http://www.PEPnonprofit.org)



vertex

# Vertical

**Question:** What is vertical?



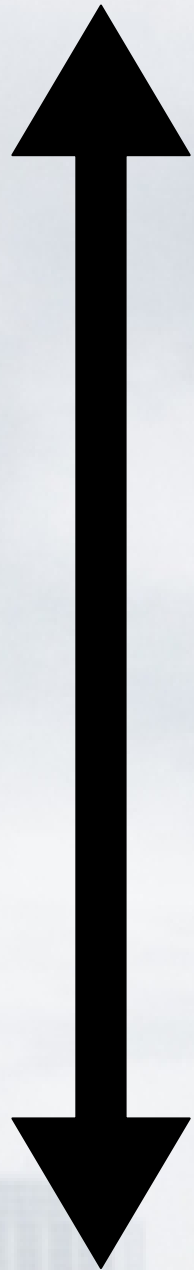
**Answer:** A vertical line is a line that runs up and down on a page.

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

**Examples:** Give students a number of problems written horizontally. Have them rewrite the problems, but this time in a vertical manner. We want kids to understand that addition, subtraction, and multiplication problems can be written in a variety of ways.



[www.PEPnonprofit.org](http://www.PEPnonprofit.org)



— 0 0 — + — 0 0 >

# Volume

**Question:** What is volume?



**Answer:** Volume is the amount of a 3-dimensional space an object takes up (like boxes in a garage). The formula for volume is length x width x height.

**Gesture:** With your right hand make a letter L with your thumb and pointing finger (length). Cross both of your arms like an X (multiplication symbol). With your left hand make the letter W with three fingers (width). Cross both of your arms like an X (multiplication symbol). Raise your hand over your head (height).

**Examples:** Bring in a cardboard box (the case kind that reams of paper come in). The students should measure the cardboard box and calculate the volume. Next have them measure one of the reams of paper. Calculate the volume of the ream of paper. Compare the volume of the cardboard box to the volume of the ream of paper. Ask the students to estimate how many reams of paper will fit into the cardboard box. Next, have them calculate how many should fit. Finally, have them fill the cardboard box with reams of paper and compare this to the calculations.





volume

# Week

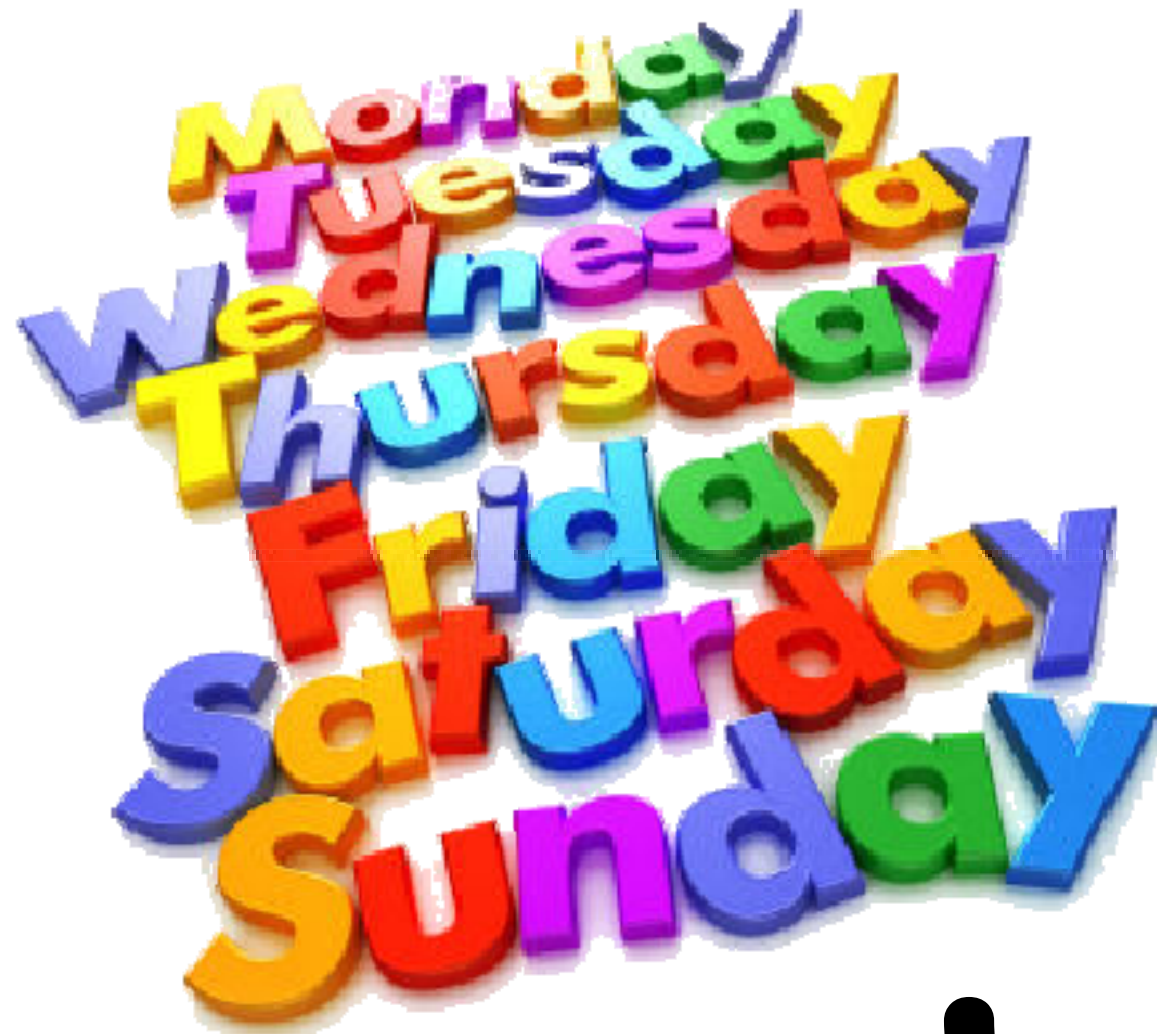
**Question:** What is a week?



**Answer:** A week is seven days. Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, and Saturday.

**Gesture:** Hold up 7 fingers and then name each day of the week as you touch a different finger.

**Examples:** Students will use 1 finger to represent seconds, 2 fingers to represent minutes, 3 fingers to represent hours, 4 fingers to represent days, and 5 fingers to represent weeks. Ask the class a variety of questions based on seconds, minutes, hours, days, and weeks. For example, ask the class to think about how long it will take for water to turn to ice in a freezer (hours). Another example could be to ask them how long it will take for a bad hair cut to grow out (weeks).



**week**

# Word Form

**Question:** What is word form?

five hundred eighty two

word form

**Answer:** Word form is a way to write a number using words.

**Gesture:** Hold your hands out very closely together, then pretend to write as if you were holding a pencil.

**Examples:** Have numbers written in a variety ways on the board:  $500 + 80 + 2$ , five hundred 82, five hundred eighty two, and 582. Ask students which of these three numbers is the biggest and why? Hopefully they will see that ALL of these numbers are the same, just written in different forms. Have students write in multiple forms (standard, word, expanded, short word) as you call out numbers.





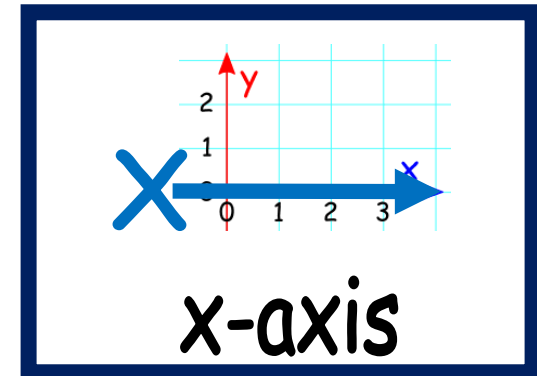
[www.PEPnonprofit.org](http://www.PEPnonprofit.org)

five hundred eighty two

word form

# X-Axis

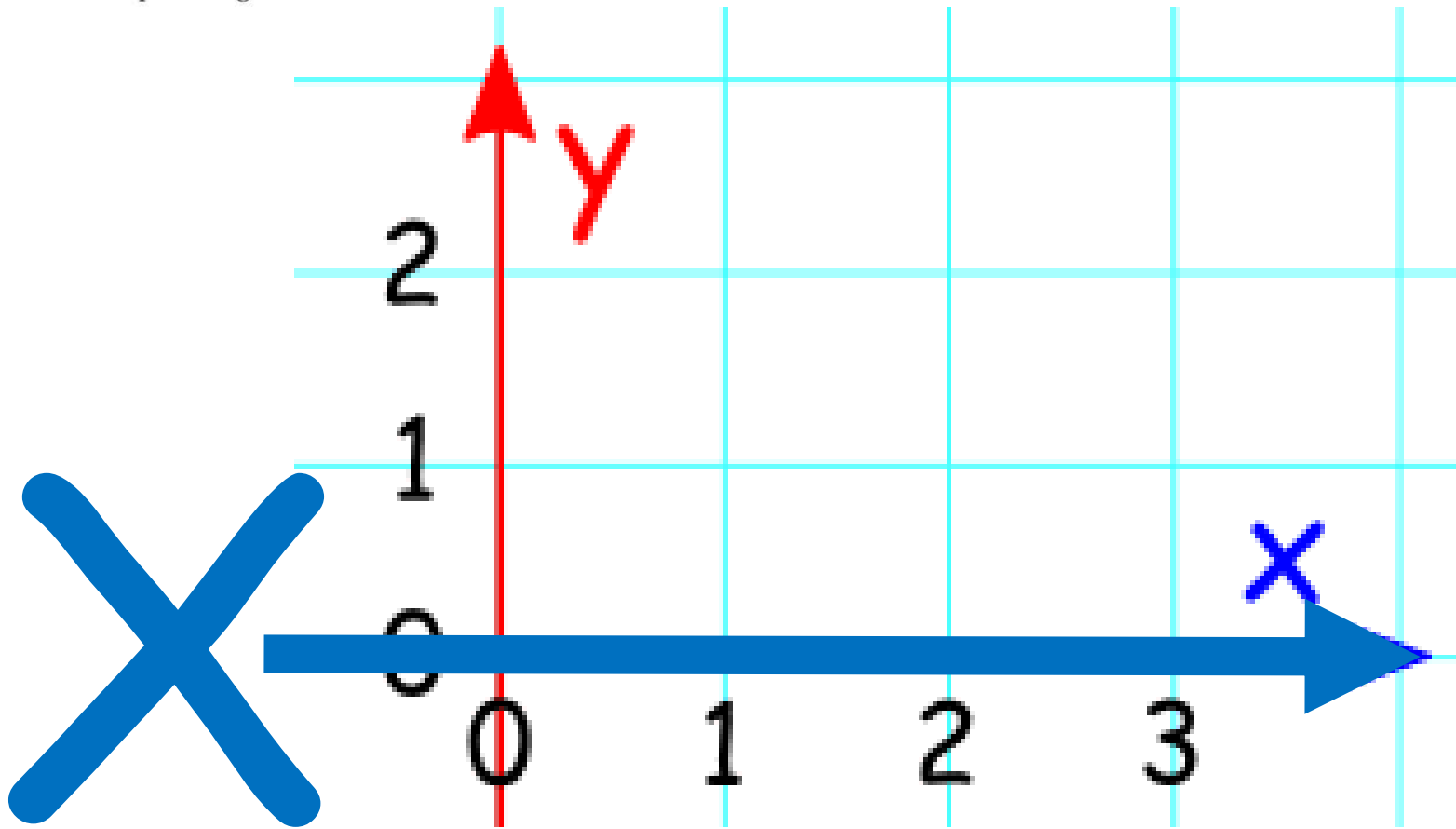
**Question:** What is the x-axis?



**Answer:** The x-axis line on a graph that runs horizontally (left-right) through zero.

**Gesture:** Cross two fingers to form an X and then hold out one arm horizontally.

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



x-axis

# X-Coordinate

**Question:** What is an x-coordinate?



**Answer:** An x-coordinate is the horizontal value in a pair of coordinates. How far to the right or left the point is. \*Remember that x comes before y in the alphabet and in coordinate pairs.

**Gesture:** Hold your arms out in front of you and form an X. Point to the left, then to the right, to show the x-coordinate is moves horizontally. Then hold up one finger to show that x-coordinate is first in a coordinate pair.

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

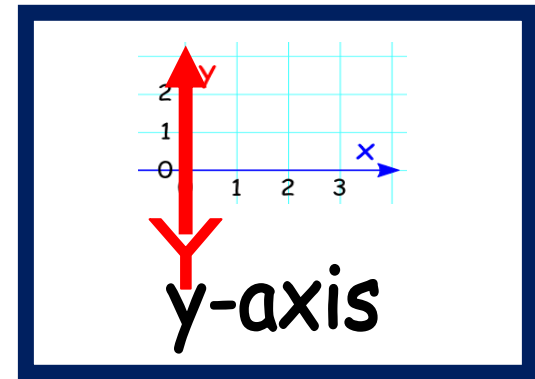


4, 6  
x, y

x-coordinate

# Y-Axis

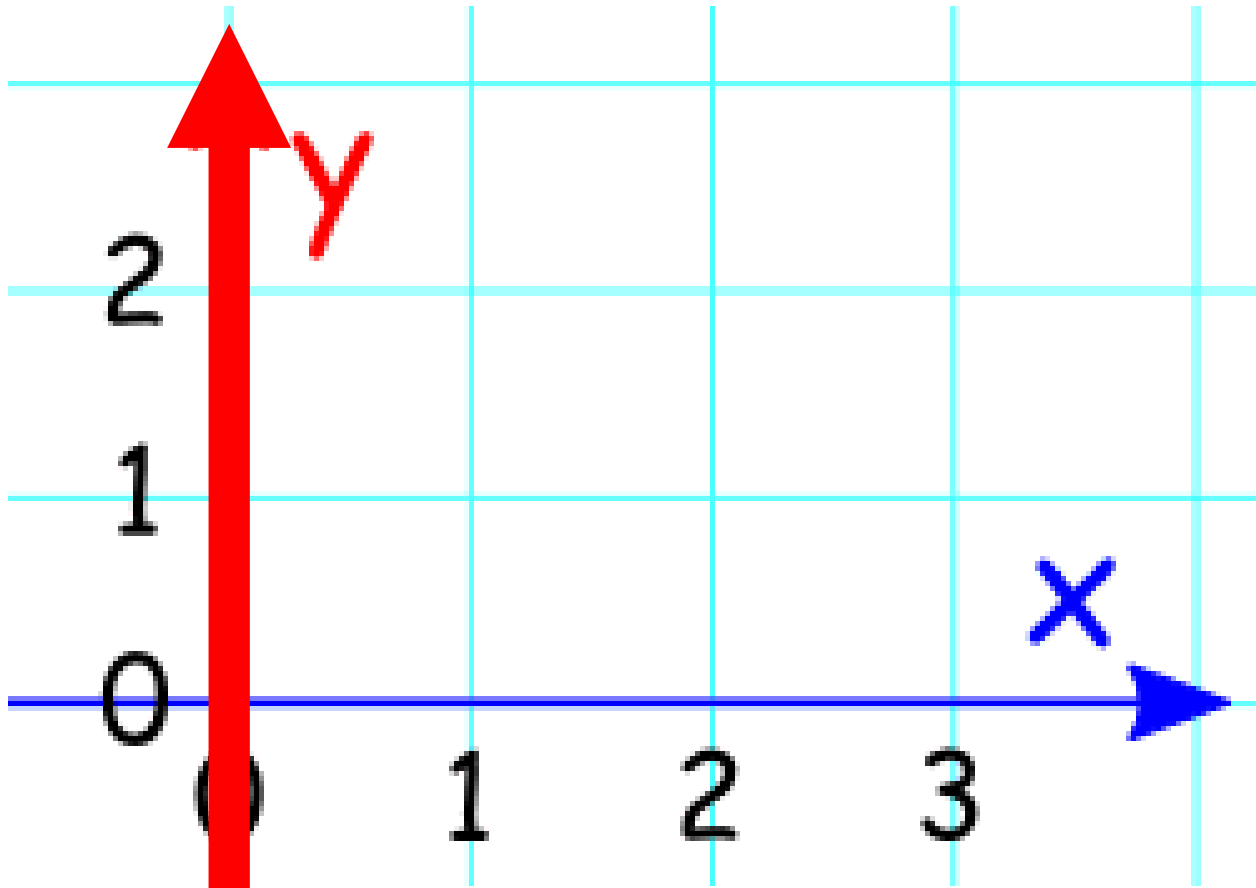
**Question:** What is the y-axis?



**Answer:** The y-axis is line on a graph that runs vertically (up-down) through zero.

**Gesture:** Hold your arms straight up over your head, like your body is the lower part of the Y and your arms straight up and a part is the upper part of the Y. Then hold your arm vertically.

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



**Y**

**y-axis**

# Y-Coordinate

**Question:** What is a y-coordinate?



**Answer:** A y-coordinate is the vertical value in a pair of coordinates. How far up or down the point is. \*Remember that x comes before y in the alphabet and in coordinate pairs.

**Gesture:** Hold your arms straight up over your head, like your body is the lower part of the Y and your arms straight up and a part is the upper part of the Y. Point up and then down, to show the y-coordinate is vertical. Then hold up two fingers to show that y-coordinate is second in a coordinate pair.

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



[www.PEPnonprofit.org](http://www.PEPnonprofit.org)

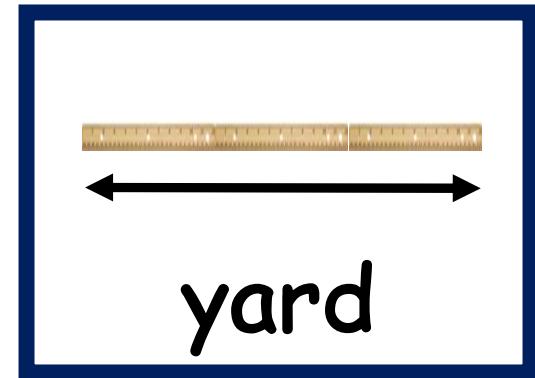
4, 6

x, y

y-coordinate

# Yard

**Question:** What is a yard?



**Answer:** A yard is a unit used to measure length/distance and is equal to three feet.

**Gesture:** Hold arms in front of you about one foot apart from side to side. Cross your arms like an X (multiplication sign) and hold up three fingers.

**Examples:** Have students start with feet side by side and move one set of toes ahead of the other set of toes to represent inches or “small.” Next, have students place one foot in front of the other to represent feet or “medium.” Finally have students take one giant step forward or backward to represent yards or “large.” Call out different measurements: Example: Move forward 2 feet, back 5 inches, sideways 1 yard. Discuss which one is largest (yard). Brainstorm things measured in yards.



[www.PEPnonprofit.org](http://www.PEPnonprofit.org)



yard

# Year

**Question:** What is a year?



**Answer:** A year is 365 days (52 weeks) or (12 months)

**Gesture:** Pretend to blow out a birthday cake candle.

**Examples:** Label each corner of your classroom: day, week, month, and year. Ask the kids some questions and have them go to the appropriate corner. You need 52 of me to make a full calendar. The sun goes up and down once on one of these. There are seven days in each.... A birthday occurs every..... As your students go to the corners they think is correct, allow them to discuss with the people in that corner why they chose that particular spot. Let each corner share out their responses.







365 days

52 weeks

12 months

year



# Zero – Product Property

$$0 \times 5 = 0$$

zero - product property

**Question:** What is the zero – product property?

**Answer:** Zero - product property states that if the product of two factors is zero, then at least one of the factors must be zero.

**Gesture:** Hold up five fingers. Cross your arms to form a multiplication sign. Hold up a zero with your fingers. Hold both arms parallel to the ground (equal sign). Hold up a zero with your fingers.

**Examples:** The product of any number and 0 is always 0. (True)

Write the following expression on the board and ask students to do mental math:

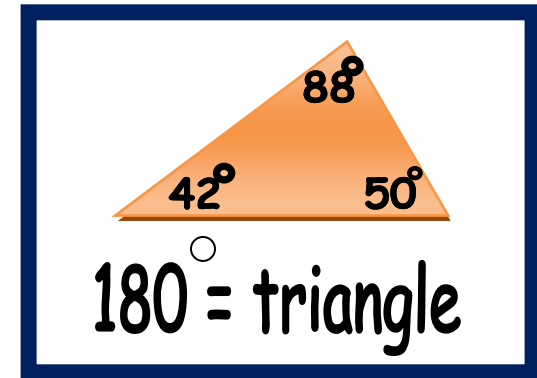
$81 \times 34 \times 0 \times 29$ . Ask them if they could use more numbers in the multiplication and ever come up with a product other than zero when one factor is 0 and multiplication was the operation. They may use their calculators to check. Do this multiple times to hit home that any digit multiplied by zero will result with a product of zero.

$$0 \times 5 = 0$$

zero - product property

# 180 Degrees = Triangle

**Question:** How many degrees in a triangle?



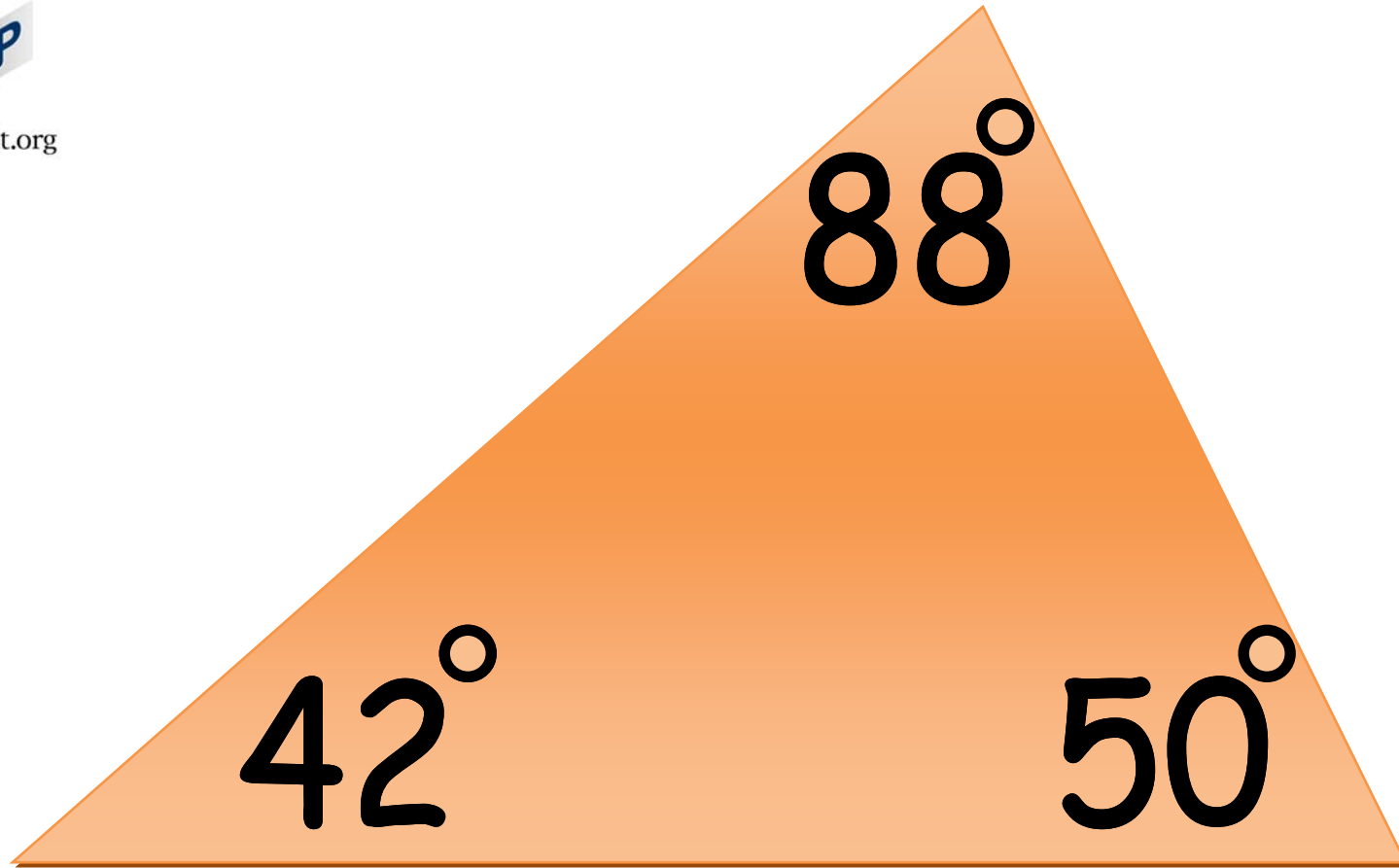
**Answer:** A triangle is 180 degrees.

**Gesture:** Draw a triangle in the air with your finger. Then hold up one finger, then eight fingers, and finally make a zero with your hand.

**Examples:** Provide students with triangles that have two angles with numbers attached. Have students determine what the missing angle, or third angle, is by having them add the two angles together and subtracting the sum from 180 to figure out the third angle.



[www.PEPhonprofit.org](http://www.PEPhonprofit.org)



$180^\circ = \text{triangle}$

# 360 Degrees = Circle

**Question:** How many degrees are in a circle?

**Answer:** A circle is 360 degrees.

**Gesture:** Draw a circle in the air with your finger. Then hold up three fingers, then six fingers, and finally make a zero with your hand.

**Examples:** Give your students a circle graph with multiple sectors. Have your students figure out how many degrees are in each sector (pie piece). Then have them add them all up to see if they come up with 360.

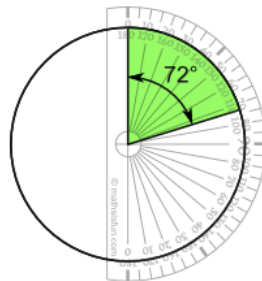
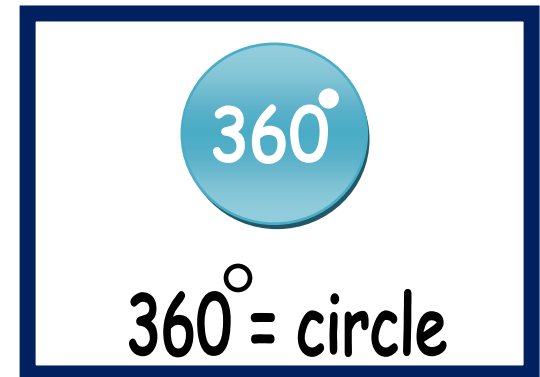


Image from [www.mathisfun.com](http://www.mathisfun.com)





[www.PEPhonprofit.org](http://www.PEPhonprofit.org)



**360° = circle**