Baseball Field Geometry

Activity	Time	Description
Activity 1	20 minutes	You will learn about different types of angles and how to identify angles used on the baseball field.
Activity 2	40 minutes	You will use a 10 foot and then a 100 foot tape measure to estimate and record distances on the baseball field. Baseball players have to adapt to different field. You will learn how you can grow your brain to adapt to new situations.

Baseball Field Geometry

Chad J. McNeely/U.S. Navy, 2009

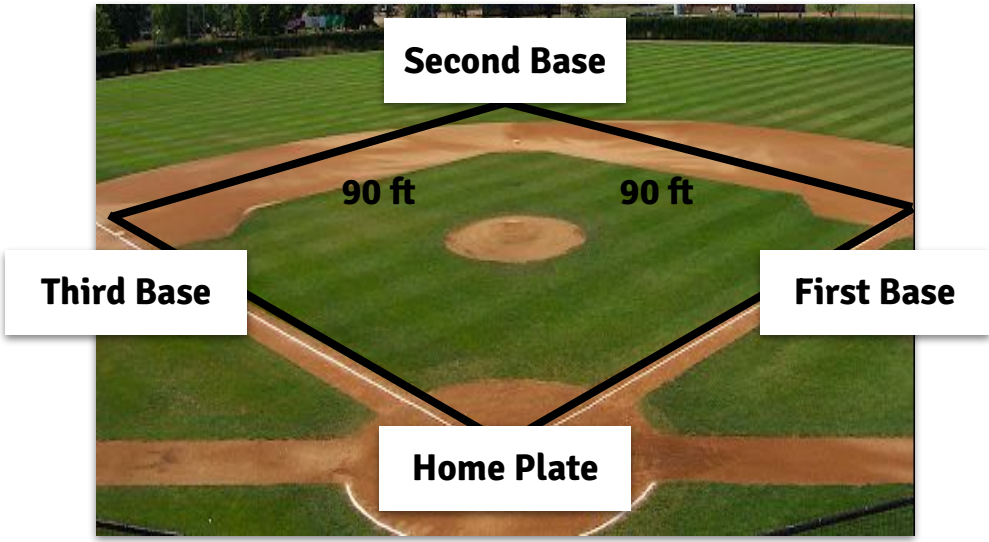
"There are three types of baseball players: Those who make it happen, those who watch it happen, and those who wonder what happens."
–Tommy Lasorda

What does this quote mean to you?

What message is Tommy Lasorda trying to send?

Activity 1: Shapes on the Baseball Field

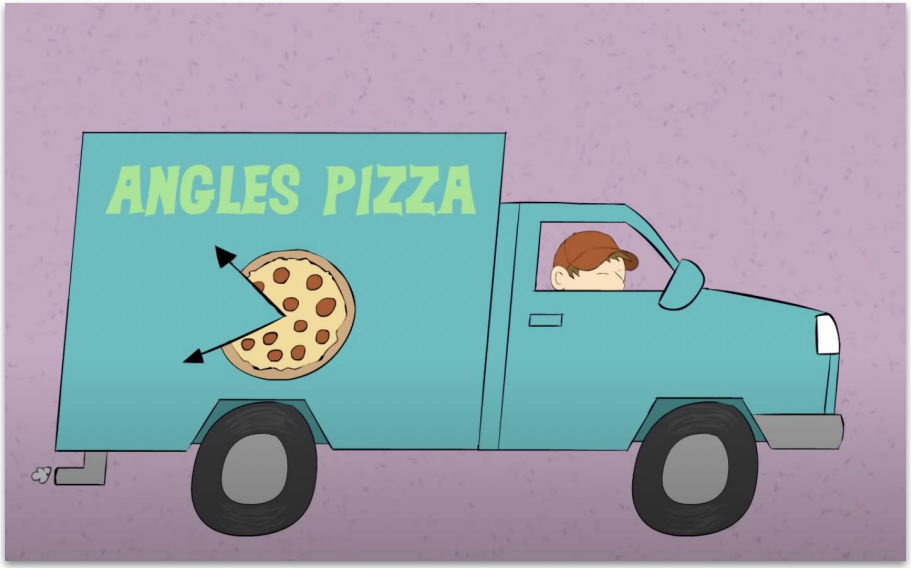
- What **SHAPES** do you see on the baseball field?
- What do you notice about distance between the bases?
- What else do you notice?

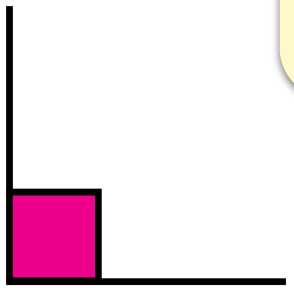


There are also ANGLES on a Baseball Field!

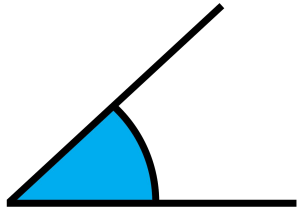
What did you learn about angles from the video?

[Angles Song | Acute, Obtuse, & Right Angles]

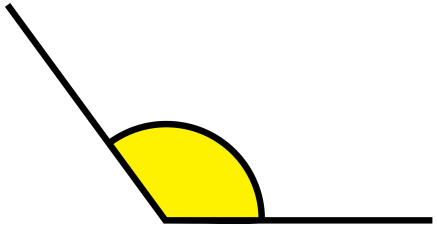




RIGHT ANGLE
Exactly 90°

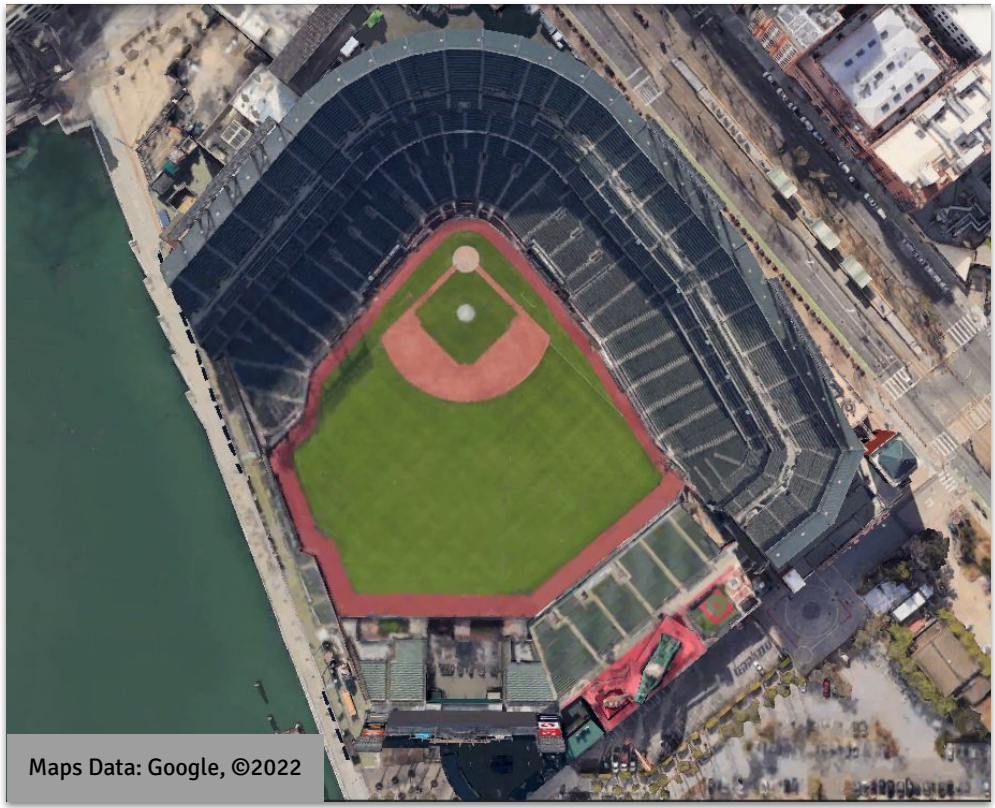


ACUTE ANGLE
Less than 90°



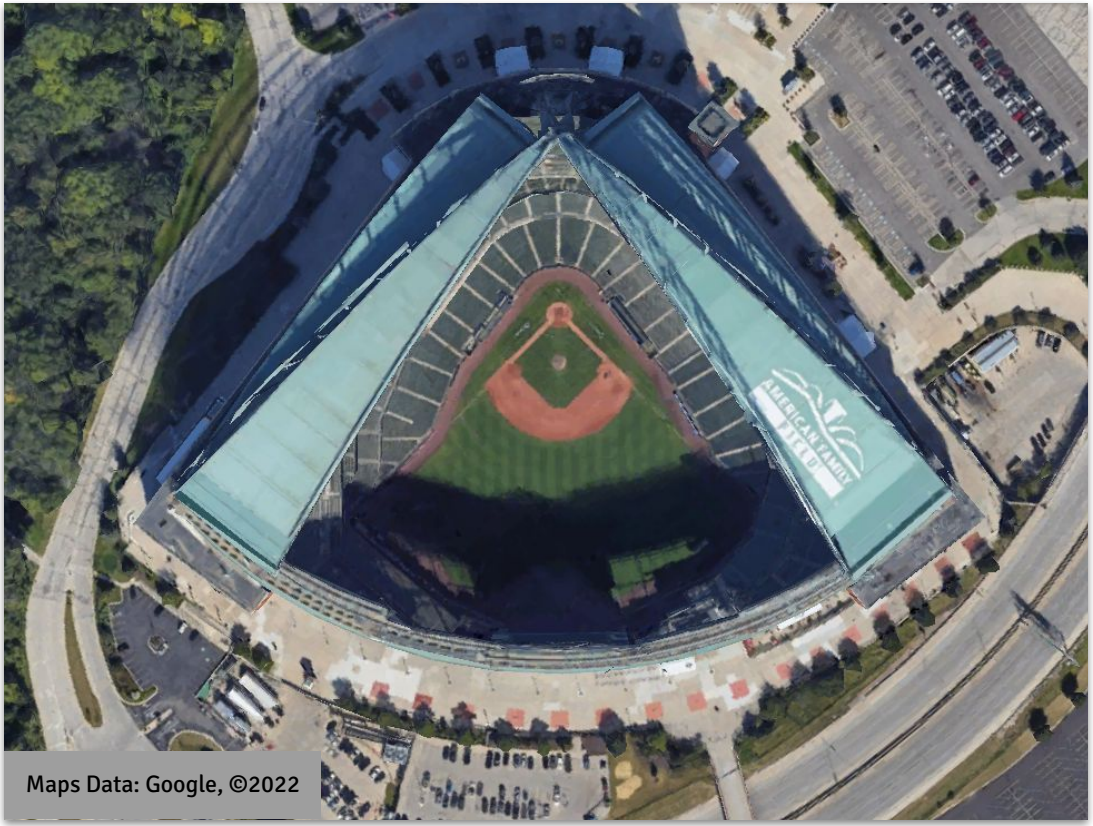
OBTUSE ANGLE
More than 90°

Let's Find Angles on a Baseball Field!

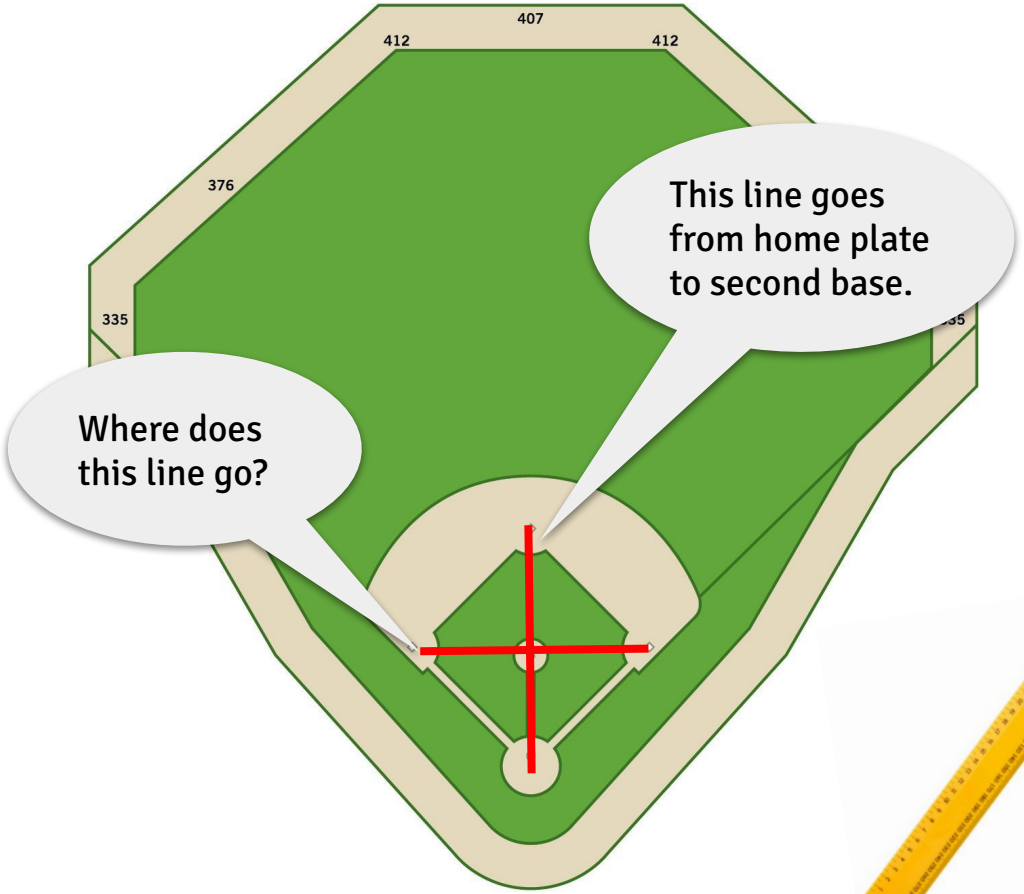


What angles do you see at Oracle Park in San Francisco, the Giants' stadium?

Let's Find Angles on a Baseball Field!



What angles do you see at American Family Field in Milwaukee, the Brewers' stadium?



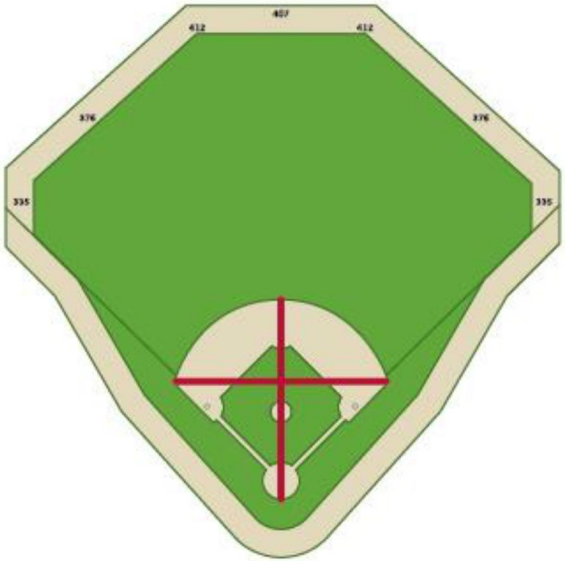
Exploring Angles on a Baseball Field

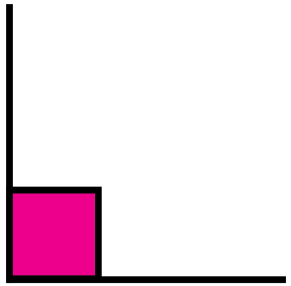
- Are the lengths of the two red lines the same? How can you check to be sure?
- What kind of angles are formed at the intersection of these lines (where the two lines cross)?

Demonstrate:
How to Use a Protractor to Measure Angles

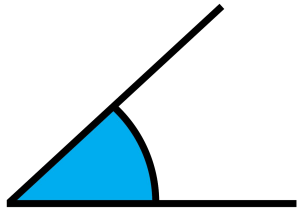
Have you ever used a protractor?

VIDEO [Math Antics: Measuring Angles](#) (0:00 - 2:31)

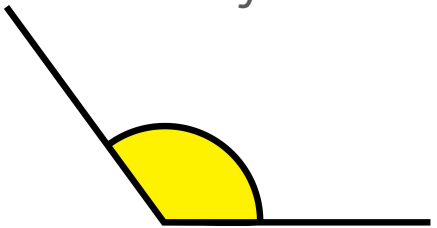




RIGHT ANGLE
Exactly 90°



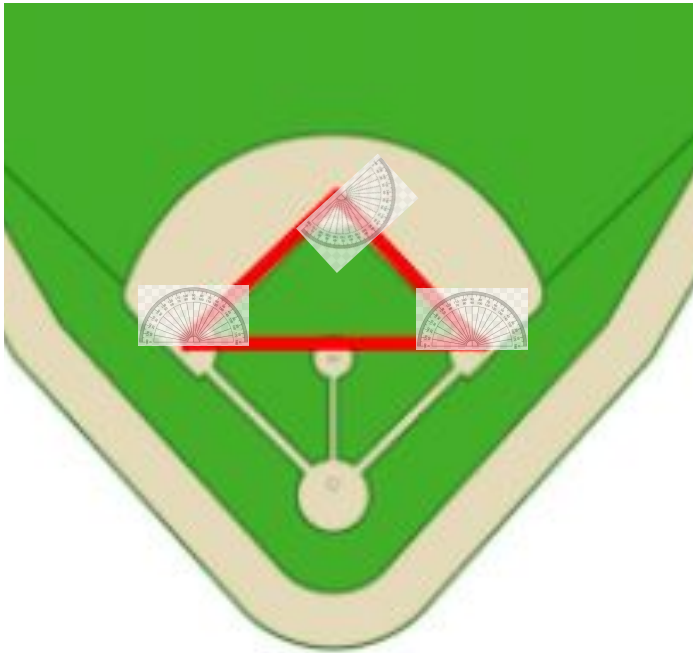
ACUTE ANGLE
Less than 90°



OBTUSE ANGLE
More than 90°

Using a Protractor to Measure Angles on a Field

- The base of the protractor should be aligned with one side of the triangle
- The circle in the middle of the base of the protractor should be placed on a corner (vertex) of the triangle.



Scenario 1

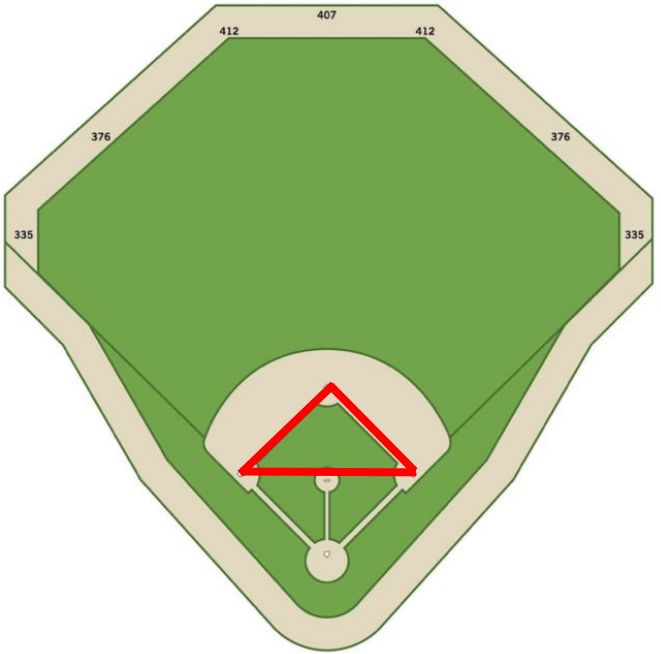
Directions: Use the information in the scenario to draw a triangle on a baseball field (Worksheet 1).

The second baseman is standing on second base with the ball, then throws it to the player standing on third base. The third baseman throws it to the player standing on first base and the first baseman throws it back to second base. Create a triangle on the field from the information.

Measure each of the angles using a protractor.

Record the angle measurements on your worksheet.

Then identify the type of triangle that you formed.



You can use a protractor to determine if the angles are acute, obtuse, or right angles.

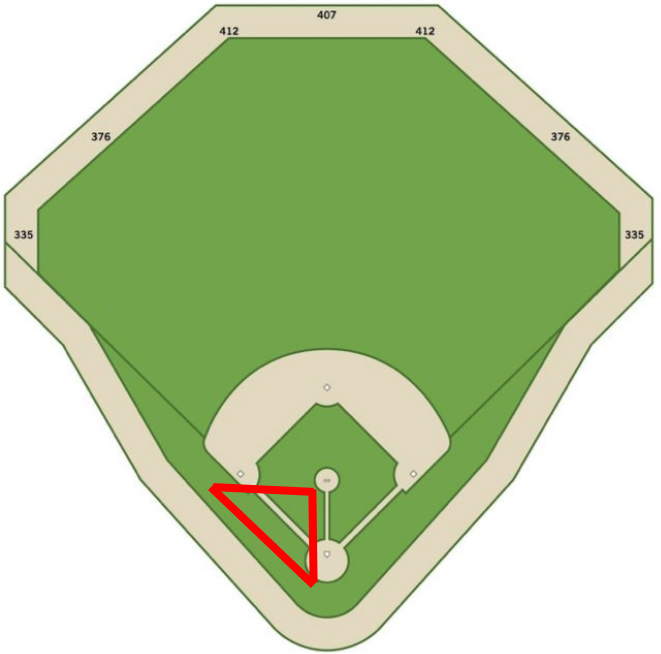
Scenario 2

Directions: Use the information in the scenario to draw a triangle on a baseball field (Worksheet 2).

Pitcher has the ball then throws it to the player standing on third base, who throws it to the catcher at home plate. The catcher then throws the ball back to the pitcher. Create a triangle on the field from the information.

Measure each of the angles using a protractor. Record the angle measurements on your worksheet.

Then identify the type of triangle that you formed.



You can use a protractor to determine if the angles are acute, obtuse, or right angles.

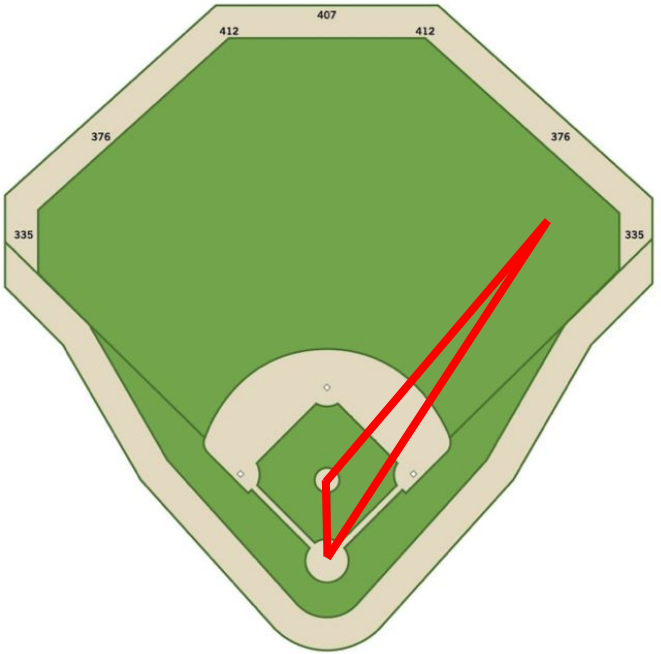
Scenario 3

Directions: Use the information in the scenario to draw a triangle on a baseball field (Worksheet 3).

The pitcher pitches to the batter. The batter hits the ball towards right field. The right fielder catches the ball and throws it back to the pitcher. Create a triangle on the field from the information.

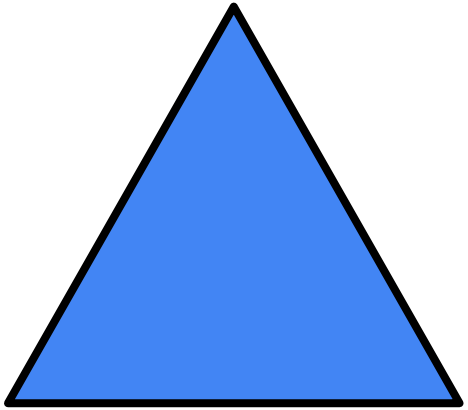
Measure each of the angles using a protractor. Record the angle measurements on your worksheet.

Then identify the type of triangle that you formed.

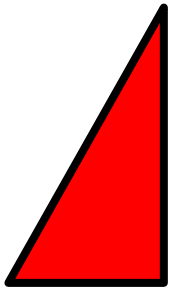


You can use a protractor to determine if the angles are acute, obtuse, or right angles.

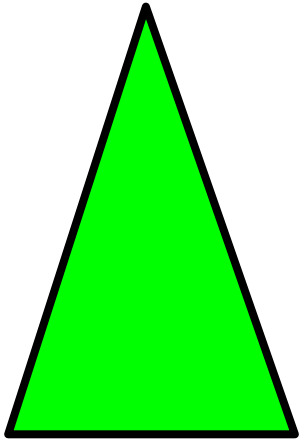
Types of Triangles



Equilateral Triangle

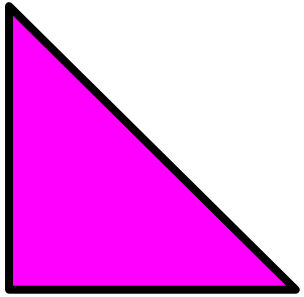


Right Triangle

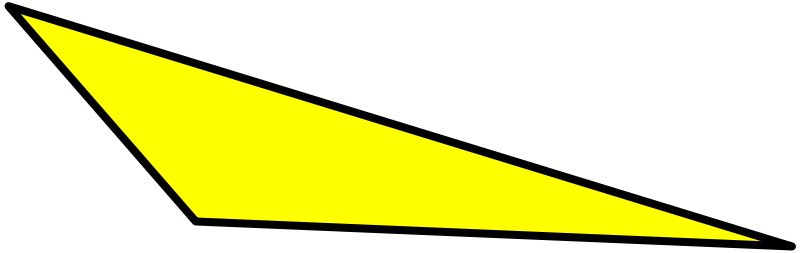


Isosceles Triangle

What kind of triangles did we draw on the field?



Isosceles Right Triangle



Scalene Triangle

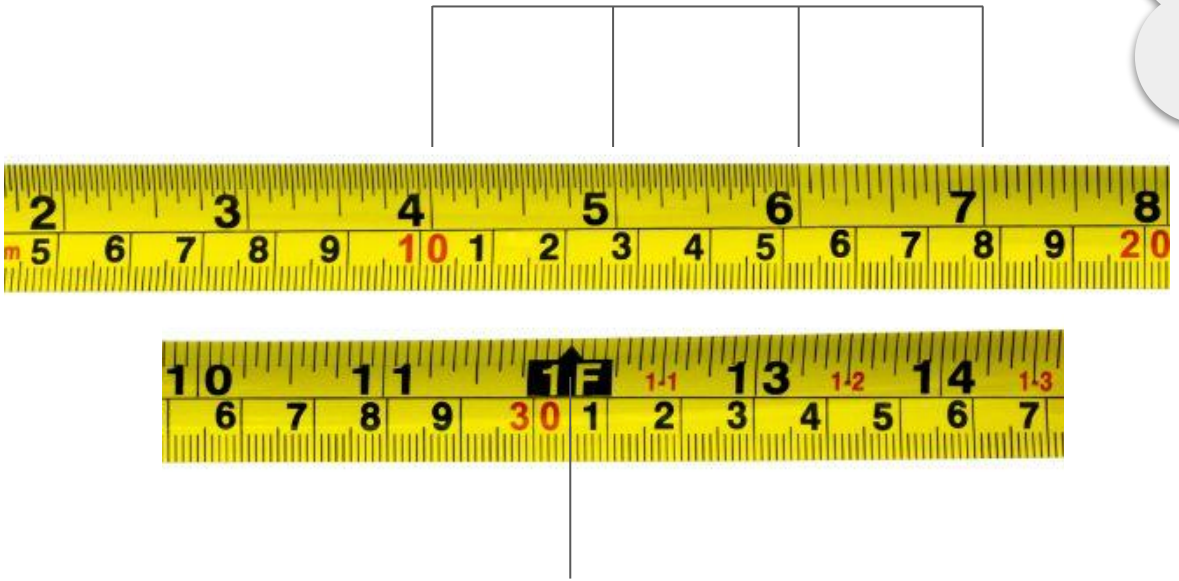
- What did you discover about shapes and angles on a baseball field?

- How might you use this information if you are setting up a baseball field for a game?

Activity 2 - Part 1: Let's Measure Distances on our Baseball Field!

- What do you know about measuring distance? What tools do you use?
- Where do you start when you measure? What do the numbers on the measuring tape mean?

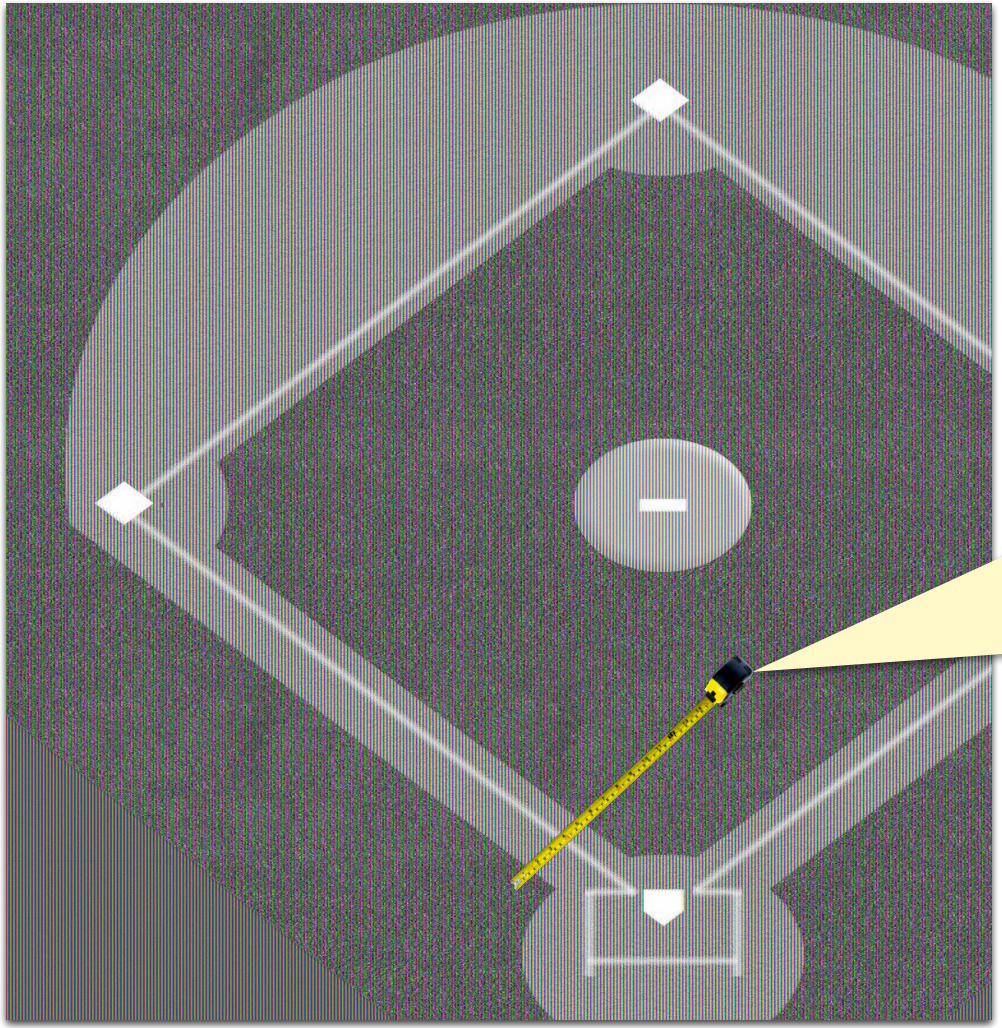
What do these lines tell us?



What does this tell us? What does the F stand for?

Safety first!

How do we keep each other and ourselves safe while using a measuring tape?



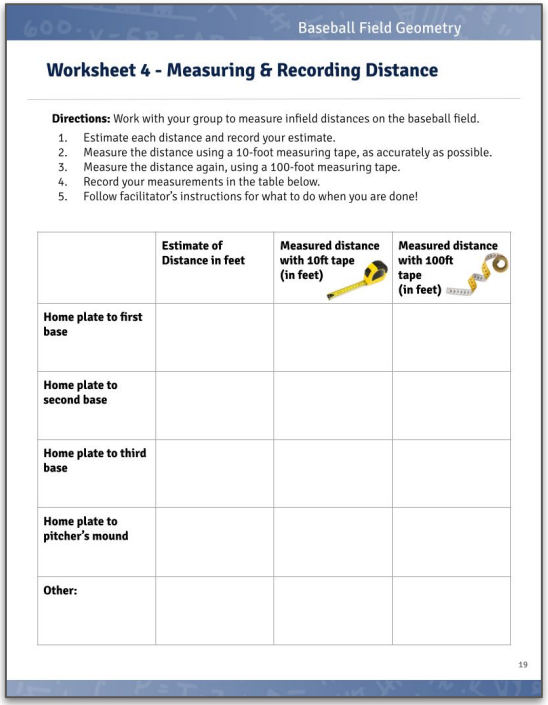
What if you are trying to measure from home plate to first base and your measuring tape runs out?

What could you do?

Measure **INFIELD** Dimensions of your Baseball Field

Directions: Work with your group of 2-4 to measure infield distances on the baseball field.

1. Estimate each distance and record your estimate.
2. Measure the distance using a 10-foot measuring tape, as accurately as possible.
3. Measure the distance again, using a 100-foot measuring tape.
4. Record your measurements on Worksheet 4.
5. *Follow your facilitator's instructions for what to do when you are done!*



Baseball Field Geometry

Worksheet 4 - Measuring & Recording Distance

Directions: Work with your group to measure infield distances on the baseball field.

1. Estimate each distance and record your estimate.
2. Measure the distance using a 10-foot measuring tape, as accurately as possible.
3. Measure the distance again, using a 100-foot measuring tape.
4. Record your measurements in the table below.
5. Follow facilitator's instructions for what to do when you are done!

	Estimate of Distance in feet	Measured distance with 10ft tape (in feet)	Measured distance with 100ft tape (in feet)
Home plate to first base			
Home plate to second base			
Home plate to third base			
Home plate to pitcher's mound			
Other:			

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Reflecting on our Findings (Comparing Measurements)

Look at what you wrote on Worksheet 4.

- How do your estimates compare to your actual measurements?
- Which measuring tool (the 10 ft tape or 100 ft tape) resulted in more accurate measurements? Why do you think that is?

Worksheet 4 - Measuring & Recording Distance

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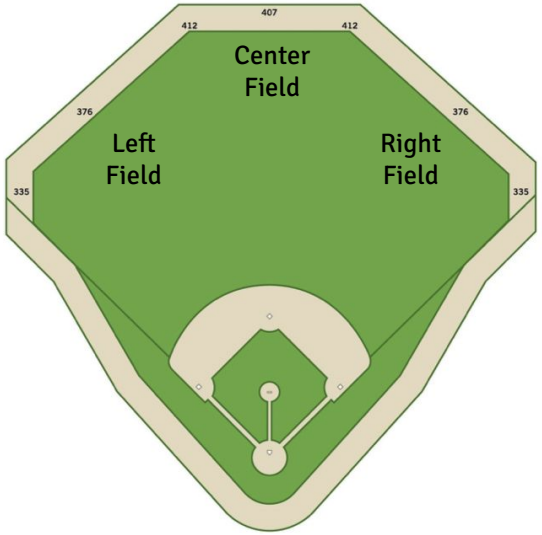
	Estimate of Distance in feet	Measured distance with 10ft tape (in feet) 	Measured distance with 100ft tape (in feet) 
Home plate to first base			
Home plate to second base			
Home plate to third base			
Home plate to pitcher's mound			
Other:			

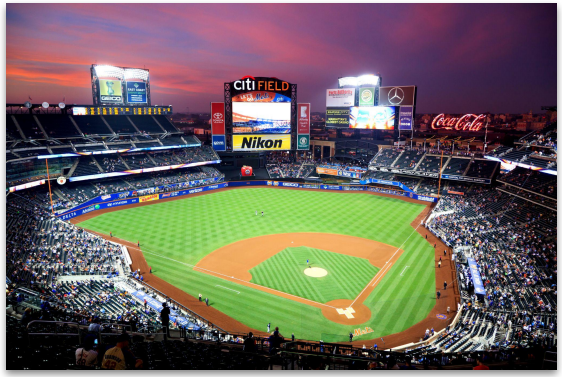
Activity 2 - Part 2: Growth Mindset



What do you notice about the OUTFIELD DISTANCES (left field, center field, right field) at different ballparks?

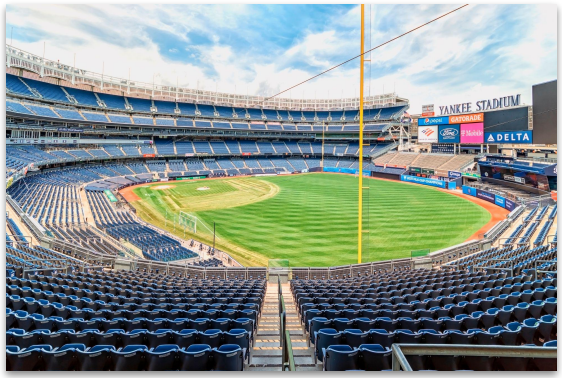
- Are they all the same?
- What differences do you notice?
- How do you think these distances impact baseball players?

Ballpark Name	Left Field (feet)	Center Field (feet)	Right Field (feet)
Chase Field	335	407	335
Wrigley Field	355	390	355
Fenway Park	310	390	302
Yankee Stadium	318	408	314
Oracle Park	365	410	335
Petco Park	334	396	322

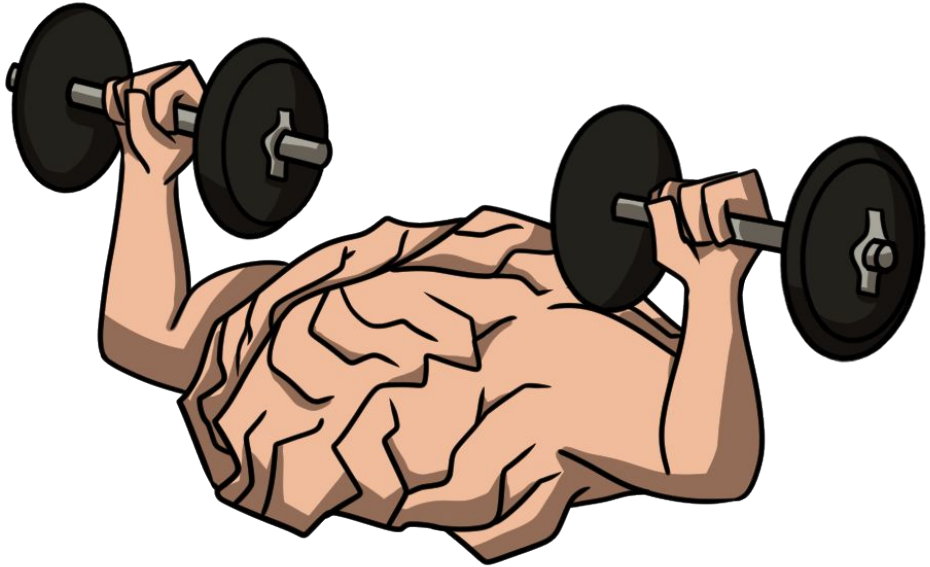


Every time players go to a different ballpark, the field distances are different and they have to adjust.

If they want to hit a home run they have to think about the best place to hit the ball.



How do you adapt to different or new situations?



Are you learning something new in school or outside of school?

Did you know? Your brain is always changing to help you learn new things!

Video about how our brains adapt when we learn new things

OR

Neuroplasticity and learning explained

- What do you do when you are trying to learn something new?
- What helps you grow your brain?
- Share your ideas with a partner.