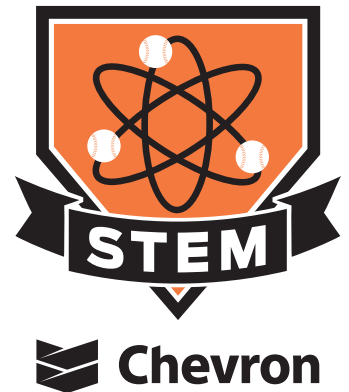


The Giant Launch ←

Hey coach/team parent! This week you're going to launch different kinds of balls with your team to show them how science and math play an important role in baseball and softball. Check out the discussion points and directions below.

What you will need:

- Ball launcher
- Squishy baseballs —players will keep at the end of the lesson
- Wide open field



READ TO YOUR TEAM:

Did you know science and math play a big role in baseball and softball? Today we're going to learn about launch angles!

Do you know what the launch angle is? The **Launch Angle** is the vertical (up and down) angle that the ball leaves a player's bat after being hit. This is also known as trajectory.

(Read team trajectory definition and show them the image on the back.)

Team, this is a science and math experiment! Each of you will have a chance to launch a ball (either a regular baseball/softball or a squishy ball) to see how far it goes.

Your goal is to launch your ball as far as you can!

STEPS:

1. Choose the ball you want to launch (your squishy baseball or a regular baseball/softball)
2. Choose the angle you want to launch it at (straight up at the sky, down towards the ground, straight like a line drive, somewhere in the middle, etc.).
3. Right before you launch, the team will count down from 3 (3, 2, 1!). After that, launch the ball!
4. Run out to where your ball landed and mark its spot with your glove or hat.
5. Run back to the team and cheer on your teammates as they launch their ball!

ACTIVITY WRAP-UP:

Gather team in a circle and ask/discuss the following questions:

1) Which type of ball traveled the farthest and why?

- **Explain:** The mass of the ball will affect the trajectory (*read your team the matter and mass definitions from this sheet*)
- **Answer:** The baseball/softball will travel further than the squishy ball because it has more mass (it is heavier).

2) Does the ball go farther when it's launched straight up into the air, launched between straight up and the ground, or launched close to the ground?

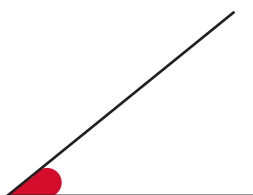
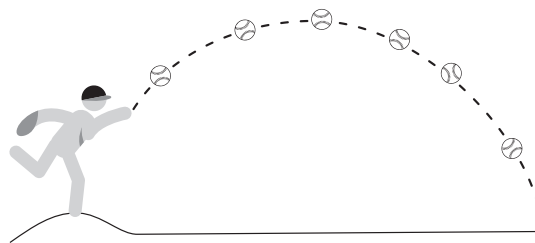
- **Explain:** The angle of the ball will determine how it is launched (i.e: 0 degrees would be a line drive parallel to the ground. Negative 30 degrees would be a grounder/chopper. 30 degrees would be a fly ball. Even foul balls popped up out of play behind the catcher have a launch angle, sometimes over 90 degrees!)
- **Answer:** The best angle to make a ball go far is 45 degrees

3) How does this activity connect to you playing baseball or softball?

- **Explain:** Knowing the angle of the ball will change the way you approach your swing or catch. (Even Giants players study the path the ball takes so they can field the ball and make the out!)
- **Answer:** You now see what the best angle is to try to hit or throw the ball. When playing defense, you can see whether you need to move forward or backward when the ball comes off the bat!

KEY CONCEPTS & DEFINITIONS:

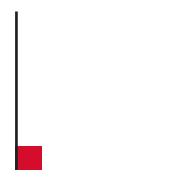
- **Trajectory:** The path an object (ball) takes while moving through the air
- **Matter:** Anything that takes up space
- **Mass:** Measure of matter, usually in weight
- **Angle:** The space between two lines that cross. This is usually measured in degrees.



45 degrees



110 degrees



90 degrees