



American Heart Association.

**KIDS HEART CHALLENGE** | **AMERICAN HEART CHALLENGE**

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# FORCES IN BASKETBALL- MOTION & GRAVITY



*STEAM Activity*

The American Heart Association recognizes the importance of building healthy bodies and minds. This STEAM activity is an introduction to science and math concepts.

## Objective:

Students will conduct a controlled experiment to determine the change in motion by measuring the number of bounces and the height of the first bounce. Students will predict how gravity and motion will affect/change the ball if it is dropped at a higher or lower height.

## Materials Needed:



Basketball



Pencil



Measuring Tape



Masking Tape

*Originally, dribbling wasn't allowed in basketball. Instead, each player had to throw it from wherever he caught it. The first team credited with advancing the ball by dribbling it played at Yale in 1897, and the official allowance for the dribble, just one per possession at first, were adopted four years later.*

## Discussion questions:

- How does dribbling work?
- Why does the ball bounce back up?
- How can you change the motion of the ball?
- What variables would affect the ball's ability to bounce?
- How do different surfaces affect the ball bouncing?
- How does the amount of air in the ball affect the ball bounce?





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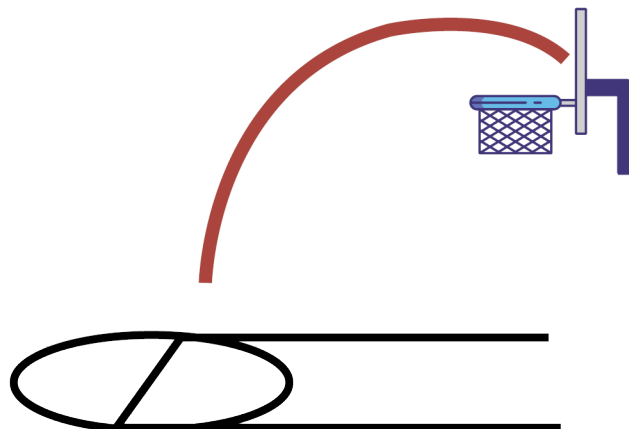
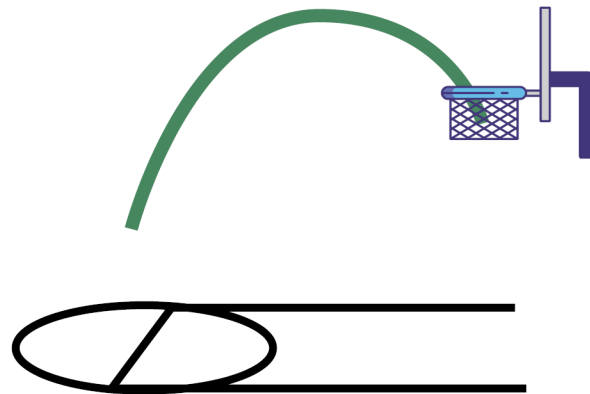
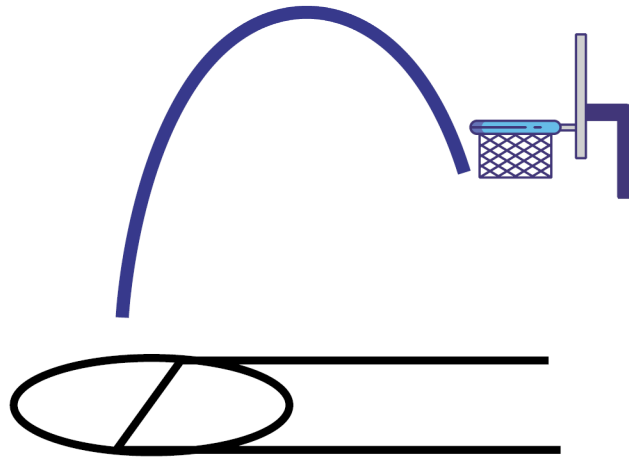
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Grades K-2

## Arcs & Angles

Student Name: \_\_\_\_\_ Teacher: \_\_\_\_\_ Date: \_\_\_\_\_

Circle which photo is most likely to go into the hoop.





## Motion & Gravity

Student Name: \_\_\_\_\_ Teacher: \_\_\_\_\_ Date: \_\_\_\_\_

### Activity:

1. With a small group or a partner, find a hard surface next to a wall (Control Variable).
2. From the floor, measure 48 inches up the wall and mark the spot with masking tape (Independent Variable).
3. Holding the ball against the wall, line up the bottom of the ball with the top of the tape.
4. From the measured height, drop the ball.
5. Measure the height the ball returns to after the first bounce. One partner should be counting the number of times the ball bounces until it stops bouncing and comes to a rest. Record data (Dependent Variable).
6. Using the same ball and surface, repeat steps 4-6, but this time from the height of 24 inches (Independent Variable).
7. Repeat each trial 3 times and include pushing the ball down with force.

# of bounces	Trial 1	Trial 2	Trial 3
48 inches Dropped			
48 Inches Dribbled/Pushed			
24 Inches Dropped			
24 Inches Dribbled/Pushed			

### Post Activity Group Discussion:

- Why does the motion of the ball change when you push it versus drop it?
- How does gravity change the motion of the basketball if it is further away from the ground?
- Predict what would happen if you dropped the basketball from 12 inches and 50 inches.