

Bouncing off the Walls

Purpose

Students will observe objects and events, and recognize and explain that when a scientific investigation is repeated, a similar result is expected.

Materials

For the teacher: chalk, chalkboard, transparency of BLM *Bouncing off the Walls*, overhead projector, transparency marker

For each student: copy of Black Line Master (BLM) *Bouncing off the Walls*, pencil

For each group of 4 students: 6 different kinds of balls (e.g., tennis, racquet, ping pong, softball, baseball, basketball, soccer), one meter of roll paper, several strips of masking tape, meter stick, marker

Activity

A. Pre-Activity Preparation

List the types of balls that will be used in the experiment on the BLM *Bouncing off the Walls* before making a copy for each student.

B. Balls, Balls, Balls

1. Display the different balls for student inspection. Ask students: "Which ball do you predict will bounce the highest when dropped? Which ball will bounce the lowest?" Make an informal survey of students' predictions and write the results on the chalkboard.
2. Ask students how they could test their predictions. Guide them to a process similar to the one described within this activity.

C. Let's Bounce

1. Divide the class into groups of four and assign each group a number for recording purposes. Give each group a set of balls, four copies of the BLM *Bouncing Off the Walls*, a piece of roll paper one meter in length, a marker, a meter stick, and several strips of masking tape.
2. Have each group hang its piece of roll paper on the wall, making sure that the bottom of the paper touches the floor.

(continued)



INCORPORATING TECHNOLOGY

Have students use a graphing program to illustrate the results of the data collection. Instruct students to include a title for their graph, the types of balls across the bottom of the graph, and the number of centimeters up the side from zero to at least their highest measurement.



EXTENDING THE ACTIVITY

Do the activity again on another day. This time, ask students to use the suggestions they came up with during the first experiment to improve their process. Analyze the data and compare the results of the second experiment to the first.

Standards Links
3.1.3, 3.1.4, 3.2.4, 3.5.2

Activity (continued)

3. Have each group drop a ball from the exact top of the roll paper and see how high it bounces. Define “drop” by noting that the ball will not be thrown or pushed, only released.
4. Tell each group to make a mark on their roll paper at the top of the ball bounce.
5. Direct students to measure from the floor to the mark in centimeters.
6. Instruct each group to record the result in the proper column on the BLM *Bouncing off the Walls*.
7. Tell students to repeat the process with the remaining balls.


D. Class Discussion

1. Tell students that they will share their data with the class. Ask them: “Do you expect the results to be similar or different with the same type of ball? Why?”
2. Have students share their measurements and record the data on a transparency of the BLM.
3. As you record the results, ask students: “Can you see similarities in the results? Are all the measurements close? Why do you think some measurements are a little different than others?”
4. Explain that when scientists repeat an experiment, they expect the results to be similar. Ask students how they might obtain more reliable data if they did the experiment again.
5. Challenge students to compare the results of the experiment with their original predictions.
6. Allow students time to complete the BLM *Bouncing off the Walls*. Tell them to keep in mind the comments made during discussion, but encourage them to include their own ideas.




Questions for Review

Basic Concepts and Processes

As students are experimenting with the balls, circulate and ask each group the following:

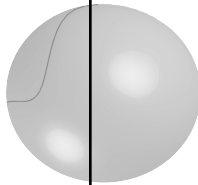
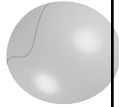
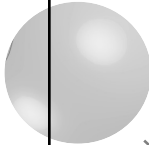
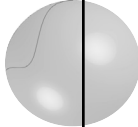
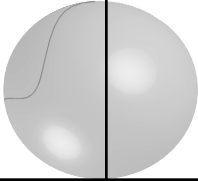
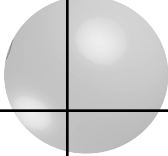
-  Do you expect that your group’s results will be similar to those of other groups? Why or why not?

After the activity, discuss the following:

-  Which ball bounced the highest? What do you think made it bounce the highest?
-  Were your results similar to those of other groups?
-  Why weren’t the measurements exactly the same?

Name: _____

Bouncing off the Walls

Type of Ball	Group 1 cm	Group 2 cm	Group 3 cm	Group 4 cm	Group 5 cm	Group 6 cm
						

Are the results similar for each group? Why or why not? _____

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Teacher Directions

Pass out a copy of the BLM *Bouncing off the Walls* to each student.

Have students record the measurements as they complete their group experiments. Have students record other group results during class discussion as you write them on the transparency.

After the discussion, instruct students to record their own observations about the experiment as they analyze the results of the experiment.

Answer Key

Student data will vary.