Unit 2

How is Flowing Water an Energy Source?

Activity A

Will water falling twice as high create a splash twice as large?

Introduction

As water falls, it is a potential source of energy. The greater the height from which the water drops, the greater the potential energy source. The splash experiment in this lesson gives students an opportunity to come to this conclusion after conducting a simple experiment.

Scientific Learning Goals and Objectives for this Activity:

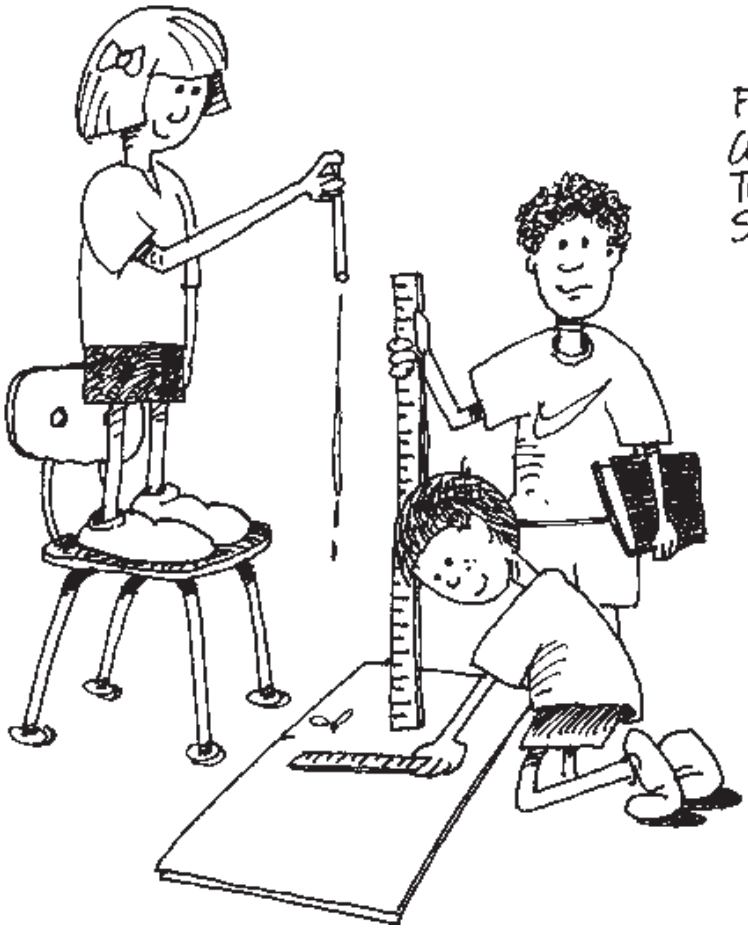
(Goals from Washington State Commission on Student Learning — Essential Learning Requirements for Science)

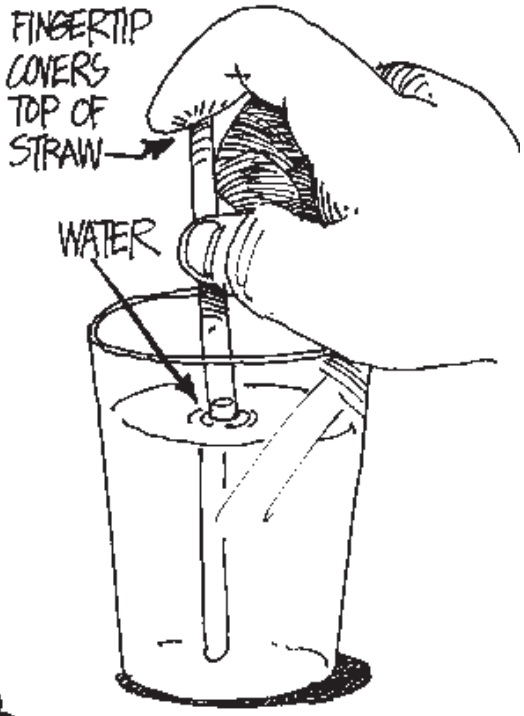
Goals

- Students will understand and apply scientific concepts and principles.
- Students will conduct scientific inquiry.
- Students will communicate scientific understanding.

Objectives

- Students will observe and understand the potential energy of falling water.
- Students will observe and document the results of adjusting variables in scientific activities.
- Students will represent data by averaging.
- Students will communicate data by graphing results.
- Students will draw conclusions from graphed data.





Teacher Preparation

Preparation Time:
15 minutes

Materials

Prepare for the Entire Class:

- water container (gallon milk jug)
- large plastic garbage bag for wet newspapers

Prepare for Each Team:

- straw
- 1 cup or beaker
- meter stick
- newspapers

Prepare for Each Student:

- copy of journal pages

Student Involvement

Activity Time:
50 minutes

Activity Processes:

? Where have you witnessed water falling before: waterfall, rain, water balloons?

Discuss student responses and list on board or overhead.

? If water falls from a greater height, will it create a bigger splash? Why?

Discuss student responses and list on board or overhead.

1. Each team predicts what they think will happen to the splash size when water is dropped from varying heights. Students enter predictions in journal.

2. Pass out materials and explain activity to test predictions. Class creates data standards for height of pour, style of pouring, and how to measure splashes. Students enter standards in journal.

Include:

- Height of pour: 30, 60, 90 cm
- Measure splashes edge to edge
- Amount of water to be dropped (recommend 1 ml)

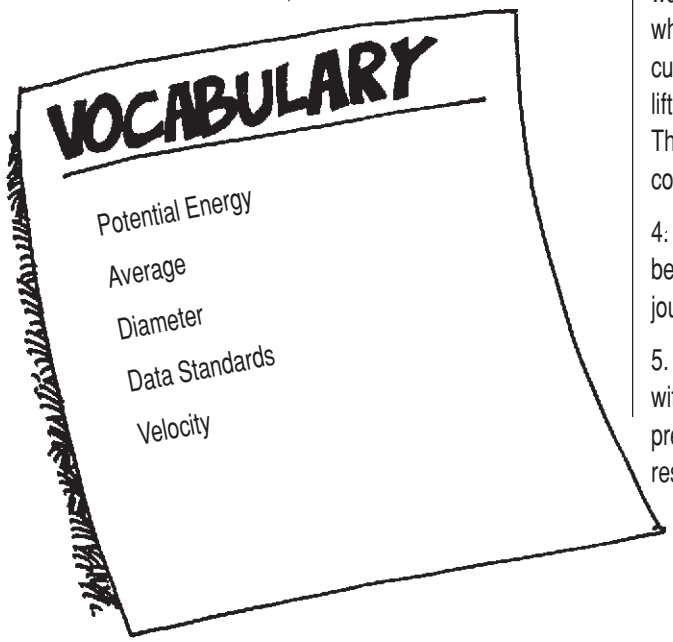
Students enter procedure and standards in journal.

3. Students test according to procedure and standards and record results and average splash in their journals. Use a straw to get a measured amount of water from your cup. If using cup, make sure to mark a water level and refill to that mark each time. Place the straw in the cup and then put your finger over the upper end of the straw. Your finger should create enough of a seal that the water stays inside the straw when you lift the straw from the cup. Release the water by lifting your finger from the straw. This method will insure consistent water quantities.

4: Students draw graph that best indicates data in their journals.

5. Each team shares results with class. If time permits, prepare class graph of team results on overhead.

6. Students enter conclusions and describe similar phenomena they have seen in nature in their journals.



Notes

The activities in Unit 2 can be set up as three stations. Each team rotates through a station and conducts activity. Class summarizes data and discusses results.

Step 2:

This activity is best done outside. Hard floors are better than carpet - if you need plastic or paper to protect floor, be sure it lays flat so water has hard contact spot.

Colored water will be seen more easily.

Step 4:

Teachers may need to review how to graph data with students.

Step 6:

Students may have observed water splash in rain erosion.

Journal 2A
Will water falling twice as high create a splash twice as large?

Name _____

Team Name _____

Date _____

Predict what you think will happen to the splash size when water is dropped from varying heights.

_____

_____

What procedure and standards are you using? For example: amount of water, height of pour, fast or slow pour, how you will measure diameter of splash.

_____

_____

What conclusion can you draw from the graphed data?

_____

_____

_____

Describe a situation in nature where you have observed something similar to the water splash experiment.

_____

_____

_____

Journal 2A Continued
Will water falling twice as high create a splash twice as large?

Water splash results

For each pour, record the diameter of the splash in the box, then calculate and record the average diameter of the splashes tried at each height.

	Diameter of Splash				
	First Pour	Second Pour	Third Pour	Total	Average (Total / 3)
Water Height at _____					
Water Height at _____					
Water Height at _____					
Water Height at _____					

Graph the average water splash results: