# Gravity with a Splash

## Summary

We want to show how the motion of water changes with the incline of a bendy straw from a higher container to a lower container. The low end of the straw has greater weight with air pressure causing gravity to drain the water. This will show the effects of gravity on the motion of water.

## Additional Core Ties

English Language Arts Grade 3 <u>Speaking and Listening Standard 1</u> Mathematics Grade 3 Strand: MEASUREMENT AND DATA (3.MD) Standard 3.MD.2

## Time Frame

1 class periods of 45 minutes each

#### Group Size

Small Groups

## Materials

Per Group or Whole Class Demonstration:

(1) 2+ liter clear container such as a rectangular glass casserole dish

(1) beaker (100 ml or larger)

Bendy straws or clear tubing 2 liters colored water

2 liters colored water

Unnecessary supplies for demonstration (cotton balls, penny, string, ruler, etc.)

Timer using seconds

# Student Prior Knowledge

Students should have previously been taught all of Standard III and Standard IV objective I for the 3rd grade science core.

## Intended Learning Outcomes

1. Use Science Process and Thinking Skills

f. Conduct a simple investigation when given directions.

## Instructional Procedures

Copy and cut out the Oral Discussion Question sheet. (See attachment.)

Give one question to each group. Have the group leader read the question and ensure that all group members participate in a discussion for 2 minutes.

Each table can quickly present their question and answer to the whole class.

The teacher will then put out the supplies for a demonstration.

Read Alexa's Dilemma.

Pedro lived at the top of a mountain in Utah in a fancy house. His best friend, Alexa, lived at the bottom of the mountain. One day Alexa wanted to fill her new swimming pool with fresh water, but her water was shut off. Pedro offered to share his water but didn't want to carry it down the mountain in buckets. What is the easiest way for Pedro to move his water down the mountain to

give to Alexa?

Then pose the question how to get water from the large container to the small container without a pump and by using the provided supplies. (Emphasize the following rules: cannot move the large container, poke holes in it, pick it up, pour/ suck the water, etc.) Brainstorm in groups and share orally with the class.

Explain to the students that only some items were necessary to transfer the water. Do the demonstration for Trial #1. For each trial use a timer to time the water. Try 15 seconds. (See instruction sheet.)

Define what the words steep decline, steep incline, and gradual decline orally.

Give groups their supplies and together run the three trials of

steep decline steep incline

gradual decline

See attached instruction worksheet for specific details.

As a teacher-led discussion, share data results and discuss conclusions. (Emphasize the fact that the amount of incline affects water motion due to gravity.)

Individually, students will complete the conclusion box on the worksheet.

Have students individually fill out the Post-Assessment worksheet.

Extension: Orally, discuss how gravity affects siphoning. Show examples of siphons in our world (toilet, wells, sink, water tower, fish tank, swimming pool). See lesson plan for video links of toilet siphoning and fish tank siphoning.

#### Strategies for Diverse Learners

For ELL's write optional hypothesis words like faster, slower, go backwards, do nothing, or stop for them to fill in the blanks.

#### Extensions

Identify different siphons that kids would be familiar with (toilet, sink, cleaning a fish tank, cleaning a swimming pool, water towers, blood moving through our veins, etc.)

#### Assessment Plan

Pre-Assessment: Oral discussion using attached questions Post-Assessment: Final worksheet with attached questions

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