

“Rocky Pond”

Standards

VT:Inquiry: 7.1 aa, bb, cc, dd Grade Cluster Expectations: **S : 1-8 (Inquiry)**

Space, Time, Matter: 7.12 aa, dd, 7.7 ee

NSES:

Scientific Investigation: (5-8) 1.1, 1.2, 1.3, 1.4, 1.5

Physical Science: (5-8) 1.1, 2.3

Score Guide

1. A. Consider the questions of Tom and Becky. Predict how the initial water level of the pond (when the rocks are in the boat) will compare to the final water level of the pond (after the rocks are dumped from the boat into the water).

Key Element:

- Prediction includes cause (rocks in the water) and effect (pond level)

B. Why do you think so?

Key Elements:

- A rationale is stated, based on the scenario or on prior knowledge.

2. Using the materials listed above, design an experiment that will test your prediction and help answer the question: How will dropping the rocks overboard affect the water level of the pond?

Key Elements:

- Organized Plan
- Identifies variable to be tested
- Identifies what will be observed or measured as evidence of change
- Identifies at least one variable that will be controlled.

3. Before you organize your results into a data table, use the box below to clearly record your labeled observations in any way you choose.

Key Elements:

- Words, diagrams or tables indicate that the student followed the design plan.
- Words, diagrams or tables indicate that accurate observations were made.

4. When you are finished, organize your results into a table.

Key Elements:

- Data clearly displayed in row and column format.
- Labels are present and relate to data collected.
- Title present and relates to data collected.

5. A. Recall the prediction that you made at the beginning of the experiment. Do the results of your experiment support, or not support, your prediction?

Key Elements:

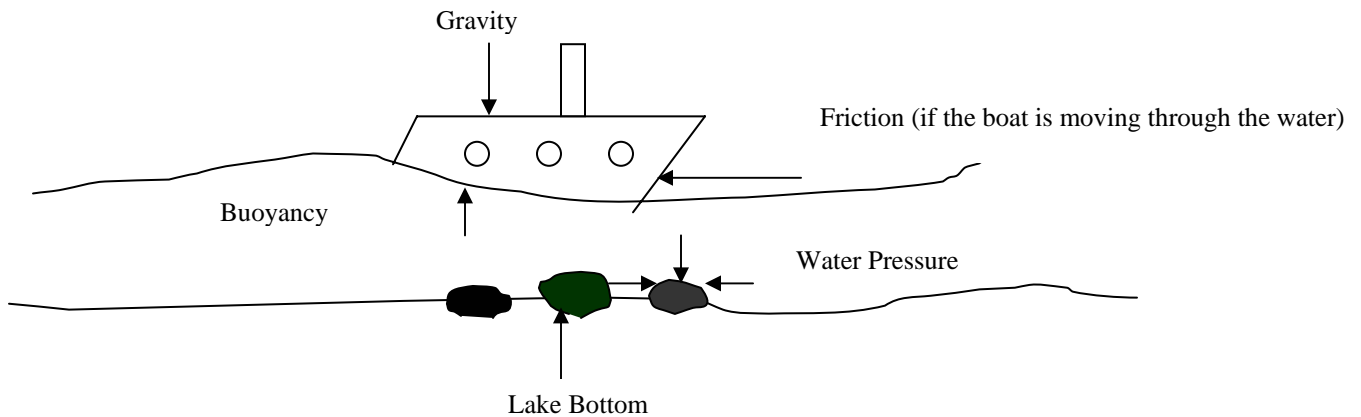
- Response states whether or not the prediction is supported. Student’s explanation needs to identify the key components of the their prediction.

Key Elements:

B. Using evidence from your data, describe why you came to this conclusion.

- Explanation cites data from the experiment in explaining why the prediction is supported or not.

6. Consider any forces which may be acting on the boat and the rocks. Show these forces by drawing arrows on the diagram below. Then label these arrows with the names of the forces.



Key Elements:

- Gravity (downward)
- Buoyancy or Weight of the Water (upward)
- Water Pressure (perpendicular to surfaces not supported by the lake bottom)
- Lake Bottom (upward)

Possibly (not prompted by the question)

- Friction (opposite the direction of movement)

7. Think about the results of your investigation, the property of density, and the forces acting on objects in water. Explain why the rocks sank to the bottom of the pond when they were thrown overboard, but did not sink the boat when they were in it.

Key Element:

- The volume of the water displaced by the rock weighed less than the rock
Or
- The rock was more dense than the water.
Or
- The buoyant force of the water was not strong enough to keep the rock afloat.