

Catch That Rainfall

Lesson Abstract

Summary:	This lesson is devised to follow the Governor's Solution. Students are given a "tract" of land and they must devise a system to catch and use all of the water that falls on their tract. They will have to manage a 2-centimeter rainfall for their 200 sq cm tract. They will also have to devise a method to store and use their rainfall. None of the rainfall can leave their property.
GLE:	7.1.A.6, 7.1.B.6, 7.1.C.6, 7.1.D.6, 7.1.E.6, See Mathematics and Communication Arts GLE on the Missouri Department of Elementary and Secondary Education (D.E.S.E.) Website: http://www.dese.state.mo.us
Subject Areas:	Science, Communication Arts, Mathematics
Show-Me Standards:	Goals – 1.3, 3.1, 3.3, 3.7, 3.8 Strands – SC 1, 2, 5, 7, 8; CA 6; MA 1
Skills:	Problem solving, predicting, estimating, reasoning
Duration:	1 class period (50 minutes)
Setting:	Classroom, laboratory, or outdoors
Key Vocabulary:	Drainage, storage, tract, property rights, water rights

Rationale:

- Water, which is a scarce resource, is essential for life.
- Society is faced with increasing and conflicting demands on water resources.
- Managing water for the future may require creative problem solving.
- Precipitation amounts are out of human control; however, people are dependent on water resources that are replenished by precipitation.

Student relevance:

- Students need practical experiences in dealing with their own property.
- Students can benefit from solving problems through conceptualization.

Learning Objectives:

Upon completion, students will learn . . .

- The difficulty in controlling water runoff.
- The complexity of problem solving.

Students Need to Know:

- Metric measurement in cm.
- Volume of water.
- How water moves.
- How much water gathers from 2 cm of rain.
- How to estimate the amount of rainfall landing on their property.

Teachers Need to Know:

- In what watershed their school building is located.

Resources:

- Local water company or county offices

Materials Needed for Lesson:

10 cm X 20 cm piece of cardboard

Plastic, clay, straws, jars, aluminum foil, pitchers, assorted containers

Metric measuring cups

Spray bottles

Trays to catch the overflow

Other available odds and ends that might be useful

Procedure:

- Review volume in metrics, 1 cubic cm = 1 mL of water.
- Divide class into groups of three or four and give each group a 10 cm X 20 cm cardboard which represents their property.
- Tell students they will need to construct a system to capture all the rainfall on their personal property using the available supplies. They must not allow water to run off of their property.
- Spray 400 mL of water onto the property to see if their system works.
- Share systems with fellow classmates.
- Ask students to write a short paragraph on what they learned from the activity and how to relate it to a real life situation.

Evaluation Strategies:

- Check the paragraph for understanding (what was the problem, how was it solved, who had the best solutions, and why).

Extension Activities:

- Have students collect newspaper and magazine articles about water rights disputes, floods, droughts, and pollution problems.

Suggested Scoring Guide:

Catch That Rainfall

Teacher Name: _____

Student Name: _____

CATEGORY	4	3	2	1
Appearance/Organization	Lab report is typed and uses headings and subheadings to visually organize the material.	Lab report is neatly handwritten or typed and uses headings and subheadings to visually organize the material.	Lab report is neatly handwritten or typed, but formatting does not help visually organize the material.	Lab report is handwritten and looks sloppy with cross-outs, multiple erasures and/or tears and creases.
Analysis	The relationship between the variables is discussed and trends/patterns logically analyzed. Predictions are made about what might happen if part of the lab were changed or how the experimental design could be changed.	The relationship between the variables is discussed and trends/patterns logically analyzed.	The relationship between the variables is discussed but no patterns, trends, or predictions are made based on the data.	The relationship between the variables is not discussed.
Replicability	Procedures appear to be replicable. Steps are outlined sequentially and are adequately detailed.	Procedures appear to be replicable. Steps are outlined and are adequately detailed.	All steps are outlined, but there is not enough detail to replicate procedures.	Several steps are not outlined AND there is not enough detail to replicate procedures.
Experimental Design	Experimental design is a well-constructed test of the stated hypothesis.	Experimental design is adequate to test the hypothesis, but leaves some unanswered questions.	Experimental design is relevant to the hypothesis, but is not a complete test.	Experimental design is not relevant to the hypothesis.
Conclusion	Conclusion includes whether the findings supported the hypothesis, possible sources of error, and what was learned from the experiment.	Conclusion includes whether the findings supported the hypothesis and what was learned from the experiment.	Conclusion includes what was learned from the experiment.	No conclusion was included in the report OR shows little effort and reflection.

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