

Roof Models

Goal: Students design and test models to explore how water flows over roofs, on soil, impermeable and permeable surfaces. Students examine how water moves across these different surfaces and explore the impacts of permeable and impermeable surfaces on surface water flow and erosion.

Objectives

Knowledge- Students understand that water moves differently over permeable and impermeable surfaces, the angle of the roof affects the speed of water flow, and that models are used to test systems.

Skills- Students build models, observe and record data, and use descriptive language to explain observations.

Values- Students realize that humans (in this case, our buildings and associated infrastructure) affect the movement of water in a watershed and that humans can mitigate (lessen) erosion of soil and water movement with catchment systems.

Grade: 4th

Special Safety: Watch for water splashes on the floor and caution students to walk carefully on the wet surface.

VA Standards addressed: Science 4.1, 4.9; Mathematics 4.8

Materials (per group of 2):

- * Turkey roasting pan
- * Rectangular Cardboard 'roof' in whole-inch dimensions
- * Aluminum foil
- * Scotch tape
- * Small plastic containers, or other stable object for elevating model roofs (2, in PLC)
- * Beaker (300 mL)
- * Kool-aid or powdered tea or lemonade
- * 3 oz paper cups (2)
- * Sponges (2 types, one that is very absorbent & one that is not such as scotch brite), cut up in different sizes, a few per group (if activity takes place inside)

Set-up:

1. One set-up per group of 2
2. Make rectangular cardboard roofs (use whole inches for dimensions, then cover with a large piece of aluminum foil with lots of overlap.) Prepare these by taping at different angles/slopes.
3. Place on top of two small plastic containers in a turkey roasting pan.
4. Sprinkle with powdered beverage.
5. Place tape and extra supplies in a easily accessible location

Procedure/Instructional Strategy:

1. Ask the classroom teacher for assistance to place students in groups of not more than three.
2. Activate prior knowledge of erosion. Ask students to give examples or provide a definition of erosion. Recall 3rd grade soil experiment activities.
3. Inquire-



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	Draw or describe the roof and the surface the 'building' model is on.	Predict: How will water move on the roof and on the ground? (Fast/slow, in a line, spread out, soak in)	Where can erosion happen? How much erosion can happen?	Observe: How did the water move? Did it match your prediction?	Observe: Did erosion happen? Describe the erosion.
Sample Trial 1	The roof is flat water falls on concrete				
Trial 2					
Trial 3					
Trial 4					

Student Names: _____



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