

Student Investigation Sheet

Discovery Education Science



Background Information:

The Trail That Would Fail

Mount Baldy is the most popular spot at the nearby park. So popular, in fact, that several trails now lead straight up to the top of hill. The view from the top is amazing, but the trails are becoming so eroded that it's easy to twist an ankle on the way down. Every time it rains, the trails get worse, and more sediment is washed into the nearby pond and stream. The city has hired you, an engineer with a landscape architecture firm, to solve the problem before it becomes even worse. People are still going to hike to the top of the hill. It's up to you to figure out how to access the top of the hill while preventing any more erosion. What are your recommendations? (The city doesn't have too much money to spend on the project, so unfortunately, a chair lift is out of the question!)

You may use a digital or video camera to record your procedures and results of this experiment.

Materials List:

- foil baking pan, 12" X 18"
- second baking pan (or bucket, dish tub, etc. for catching water)
- 2 L of sand
- 50 mL water per test
- water to saturate sand
- beaker or graduated cylinder
- graduated cylinder or balance for measuring eroded sand
- 50 mL pea gravel or aquarium gravel
- spoon
- two rulers (to represent pavement—any thin impermeable material could work)
- three popsicle sticks to divert water
- 2—4 books of approximately the same thickness to create hill slope
- protractor
- trowel (optional)
- digital camera or video camera (optional)

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Key Question

What was the question that you want to answer?	<i>Directions:</i> Write the question for the investigation. The question should be specific and be able to be investigated.
	<u>Key Components</u> <ul style="list-style-type: none">• Specific (one general thought, does not combine two or more questions)• Is able to be investigated

Hypothesis

Claim that answers your question based on the evidence	<i>Directions:</i> Develop a claim about what you think is going to happen.
	<u>Key Components</u> <ul style="list-style-type: none">• Expresses a cause and effect relationship• Is testable• Incorporates prior knowledge



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Plan

How Will You Investigate the Question?

Directions: Describe the plan that you will use to study your question and analyze your hypothesis.

Key Components

- Plan is easily repeatable by others
- Plan describes the use of materials
- Plan is in a logical order

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Data

Evidence from this investigation	<i>Directions:</i> Record all of the evidence that has been collected. Evidence can be any data that helps answer the question appropriately and completely. The focus of this section is on what was found during the investigation.
	<p><u>Key Components</u></p> <ul style="list-style-type: none">• Data (from an investigation and/or other sources, such as observations, reading material, archived data, etc.)• Appropriate (data applies directly to the question)• Sufficient (uses enough data to completely answer the question and determine a finding on the hypothesis)



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Conclusion

Summarize Your Findings

Directions: Develop a conclusion for your investigation. The conclusion should contain clear thoughts and vocabulary that has been studied. This section focuses on the answer to the question and either proving or refuting the hypothesis. This should be done by linking the hypothesis to the data using logical reasoning.

Key Components

- Use precise and accurate language
- Use scientific vocabulary
- Provide clear logical thoughts
- Use evidence and reasoning to support or refute the hypothesis

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Analysis and Conclusions

1. What causes erosion? How can the effects of erosion be reduced?
2. What about the design worked well? What didn't work well? How might you change the design in the future?
3. What *didn't* the investigation tell you? What other variables could you test?
4. How was the model like real life? How was it different? How could you make it more like real life?