



EnviroAtlas

people health nature economy

Lesson Plan

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Exploring Your Watershed: Wax Paper Simulation

These materials are part of EPA Report #EPA/600/R-18/203.

Student Name(s): _____

Key Words/Vocabulary

adapt	ecosystem	erosion	pollution	ridge	stream
divide	ecosystem services	flooding	pond	river	watershed
drainage	environment	habitat	precipitation	runoff	

Procedure, Pre-Lab

1. Lightly crumple up the piece of wax paper at your station.
2. Unwrap the wax paper and smooth it out until it looks similar to the photo above (not all the way unwrapped and still a little crinkled). This is your **landscape**.
3. Using your washable markers, color the highest points. Use different colors along different high points, as shown in the photo to the right.
4. Answer the pre-lab questions 5-6.



Pre-lab Questions

5. Your crinkled-up piece of paper represents the landscape. The peaks are sometimes called “ridges” or “divides.” Does your landscape have ridges or is it flat? How is this like where you live? Be as specific as possible. _____

6. In a minute, you are going to *lightly* spray water onto your landscape—this spray will represent rain, or **precipitation**. Make a prediction: What do you think will happen to your landscape when you spray the water? Use the words “precipitation” AND “ridge” or “divide” in your answer. _____

Procedure, Lab

- Using your spray bottle of water, very lightly spray your landscape (this should be a light mist to simulate sprinkling, or light precipitation). No downpours!
- Observe your **landscape** and discuss with your lab partners what you observe.
- Continue a few sessions of light “mistings” until water begins to pool in the bottom of your wax paper.
- With your lab partner(s), **explain** out loud what is happening when the precipitation falls on your landscape. Be sure that everyone has a chance to explain something that they saw and that everyone adds to the explanation when the teacher comes by to listen to your explanations.
- Answer the post-lab questions 12-18.

Post-lab Questions

- Look back at your answer to pre-lab question #6. Was your prediction correct? Explain why or why not and what happened. _____

- You colored some of the ridges different colors. How did the rain make the different colors travel? _____

- How might **pollution** in one part of a watershed impact the water supply? In your answer, give at least one example of a type of pollution that could impact the watershed or animal habitats within the watershed. _____

- Where did all of the water collect in your landscape? _____ This collection of water in a real landscape could be a **pond** or a **lake**. You might have more than one lake or pond in your landscape. This means that you have **multiple watersheds!** Count the total number of watersheds in your landscape. Write that number here: _____. When your teacher comes by, have your teacher check for you to make sure you counted them all!
- Is there any water that ran off the side of your wax paper into the tub? _____ In an actual landscape, what would that water flow into? _____
- In real life, the lines that travel from near the tops of the ridges down into ponds and lakes are called **streams**. Point out the **stream(s)** in your wax paper landscape when your teacher comes by. Count the number of stream(s). Write that # here: _____
- When water travels over the land, this is called **runoff**. What happens to runoff after lots of rain? _____



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Procedure, Pre-Lab

1. Lightly crumple up the piece of wax paper at your station.
2. Unwrap the wax paper and smooth it out until it looks similar to the photo above (not all the way unwrapped and still a little crinkled). This is your **landscape**.
3. Using your washable markers, color the highest points. Use different colors along different ridgelines, as shown in the photo to the right.
4. Answer the pre-lab questions 5-6.



Pre-lab Questions

5. Your crinkled-up piece of paper represents the landscape. The peaks are sometimes called “ridges” or “divides.” Does your landscape have ridges or is it flat? How is this like where you live? Be as specific as possible. *The high points are like hills or mountains and the low points are like valleys, where creeks or rivers might be (does not have to be exact).*
6. In a minute, you are going to *lightly* spray water onto your landscape—this spray will represent rain, or **precipitation**. Make a prediction: What do you think will happen to your landscape when you spray the water? Use the words “precipitation” AND “ridge” or “divide” in your answer. *When we spray the water, like precipitation falling on the landscape, the water drops will run down the slopes based on which side of the ridges, or divides, they fall on. Water will pool in the low areas or in the tub (does not have to be exact).*

Procedure, Lab

7. Using your spray bottle of water, very lightly spray your landscape (this should be a light mist to simulate sprinkling, or light precipitation). No downpours!
8. Observe your **landscape** and discuss with your lab partners what you observe.
9. Continue a few sessions of light “mistings” until water begins to pool in the bottom of your wax paper.
10. With your lab partner(s), **explain** out loud what is happening when the precipitation falls on your landscape. Be sure everyone has a chance to explain something that they saw and that everyone contributes to the explanation when the teacher comes by to listen to your explanations.
11. Answer the post-lab questions 12-18.

Post-lab Questions

12. Look back at your answer to pre-lab question #6. Was your prediction correct? Explain why or why not and what happened. *Answers will vary.*
13. You colored some of the ridges different colors. How did the rain make the different colors travel? *Answers will vary; some students may have found that their colors mixed together in a pool, showing that different slopes can be in the same watershed.*
14. How might **pollution** in one part of a watershed impact the water supply? In your answer, give at least one example of a type of pollution that could impact the watershed or animal habitats within the watershed. *Answers will vary.*
15. Where did all of the water collect in your landscape? *In the bottom or the lowest point.* This collection of water in a real landscape could be a **pond** or a **lake**. You might have more than one lake or pond in your landscape. This means that you have **multiple watersheds!** Count the total number of watersheds in your landscape. Write that number here: *will vary.* When your teacher comes by, have your teacher check for you to make sure you counted them all!
16. Is there any water that ran off the side of your wax paper into the tub? In an actual landscape, what would that water flow into? *Answers will vary; examples include the continuation of the same stream or river, a wetland, the sea.*
17. In real life, the lines that travel from near the tops of the ridges down into ponds and lakes are called **streams**. Point out the **stream(s)** in your wax paper landscape when your teacher comes by. Count the number of stream(s). Write that # here: *will vary*
18. When water travels over the land, this is called **runoff**. What happens to runoff after lots of rain? *Answers will vary; examples include how more water can cause erosion or mudslides on the slopes, potential flooding of pond or lake shores containing houses, etc.*