

Watersheds: Where does the Water Go? Handout

Students practice for the FCAT while learning about watersheds.

Water Atlas Curriculum Lesson 29 FCAT Supplement

Discovering Watersheds

Have you ever noticed that water always runs down a hill or slope? Even in the flattest parts of Florida, there is some small slope that leads water on its way — usually towards a lake or a river. People have altered water's natural path by creating swales, ditches, and canals that send water to specific places. For example, sidewalks are usually built on a gentle slope. This allows rain water to run off instead of forming a puddle where people want to walk. This runoff may travel to a swale, a ditch, a retention pond, or a storm drain. But where does the water go after that? Water can travel many paths. It can flow out of the storm drain into a lake or river. It can evaporate and return to the air. It can be soaked up by a plant. It can be lapped up by an animal. Some water trickles down through the soil and finds its way into the aquifer below.

So what happens if water becomes polluted along the way? This pollution will travel with the water as it flows on its downward journey, gathering at the low spot in the watershed area. For example, if someone dumps used car oil down a storm drain, the oil floats along with the water. When it reaches a lake or river, the oil may coat an animal's fur or feathers, making it hard for the animal to stay dry and warm. Pollution often travels far from its original location. So how can scientists figure out where a pollution problem starts?

They study the local watershed to pinpoint where the problem is coming from. They know immediately that the pollution must be coming from somewhere inside the watershed (or drainage) area. If it was outside the watershed, the pollution would drain away to a different spot. Scientists can also predict that the pollution is coming from an area upstream of the polluted spot. Why? Because water always flows down a slope. Once they've narrowed the possible problem areas, scientists can investigate to learn which homes, businesses, and factories are in the area.

Is the pollution caused by pet waste? Then it's probably not a factory causing this issue. Maybe local homeowners can be educated about the need to scoop their pets' poop. Is the problem excess laundry detergent? Perhaps a local laundromat has a leak they don't know about. By combining contour maps (which show high and low areas) with maps that show how the land is being used, scientists can solve pollution mysteries and keep Florida's watersheds, lakes, and rivers clean.

To make your own mini-watershed, wad up a piece of scrap copy paper, then unfold it a bit so that it has some high spots and some low spots. Take a water-based marker and trace some of the high crinkles on your watershed. (These ink marks represent pollution.) After you draw, make sure your watershed is still lumpy — not flat. Next, fill a small spray bottle with water. Before you spray, predict which directions the water will flow when it hits your mini-watershed. And be specific; don't just predict "down." Once you've made your prediction, lightly spray the paper and watch the directions the water flows. If it flows to two or three different areas, you've got two or three different watersheds.

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If all of the water flows to only one space, you've created a single watershed. Did the ink flow with the water? If so, the "pollution" travelled from the places you drew it, down through the watershed to the lake or river at the bottom. Pollution rarely stays in one place, so now that you're done with your mini-watershed, let it dry, ball it up tight, and put it where it belongs — in the recycle bin!

FCAT-Friendly Reading Questions:

1. The article describes how watershed information can be used to solve pollution problems. Use details and information from the article to explain how this might work.

According to the article, which of the following defines a watershed?

- a. the high ridges that separate low areas
- b. the ditches on both sides of a high area
- c. the area where water flows down towards a river or lake
- d. the area where water moves up towards a river or lake

Place the following mini-watershed instructions in the correct order.

- i. Predict where the water will flow.
- ii. Crumple a piece of paper.
- iii. Spray the paper lightly.
- iv. Draw ink lines on the crinkles.
- v. Watch where the water flows to.

- a. iii., ii., i., iv., v.
- b. ii., iv., i., iii, v.
- c. v., iii., i., iv., ii
- d. ii., i., iv., iii., v.

What do you think was the author's main reason for adding the mini-watershed activity at the end of this article?

- a. to emphasize that recycling is important
- a. to share a hands-on experience of the way water flows
- b. to make a mess in the classroom
- c. to practice your skills of predicting

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FCAT-Friendly Writing Prompts:

1. Many times lawn sprinklers are set poorly, so that they only spray the street. Imagine that you are a water drop that gets sprinkled onto a street. Write a story about your day as you flow down through your watershed.

During rainy weather, roads and yards can flood because the water has no place to drain. Imagine that you are the only person on your block with a rowboat during a flood. Write a story about your day in the boat.

Trash often gets moved by wind and water. Think about the different places a rainstorm could carry a Styrofoam cup. Write to explain where the cup goes and how it gets there.

Because water can carry pollution all through a watershed area, it is important for neighbors to work together to solve pollution problems. Imagine that one neighbor in a community refuses to clean up his pollution. Write to explain how his or her actions can impact the entire community.

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FCAT-Friendly Math Questions:

In Orange County, scientists collect data to measure the health of local watersheds. Your teacher can help you find more information online at <http://www.Orange.WaterAtlas.org/>.

Here is some information about two Orange County watersheds:

Watershed Information

<i>Data Collected</i>	<i>Reedy Creek Watershed</i>	<i>Boggy Creek Watershed</i>
Size of the Watershed	73.9 Square Miles	84.9 Square Miles
Number of Lakes and Rivers in this Watershed	73 Lakes, 5 Rivers	53 Lakes, 8 Rivers
Amount of Watershed that was Upland (Dry Land) in 2004	57%	76%
Amount of Watershed that was Wetland in 2004	33%	14%
Rainfall in 2010	38.75 inches	46.71 inches
Rainfall in August 2010	3.32 inches	5.62 inches
Average Rainfall during the month of August in Previous 5 Years	5.65 inches	5.11 inches

1. In August 2010, the amount of rainfall is less than the average rainfall in previous years. For the Reedy Creek Watershed, which of the following shows how much the rainfall has decreased?
 - a. by 9%
 - b. by 18%
 - c. by 41%
 - d. by 59%

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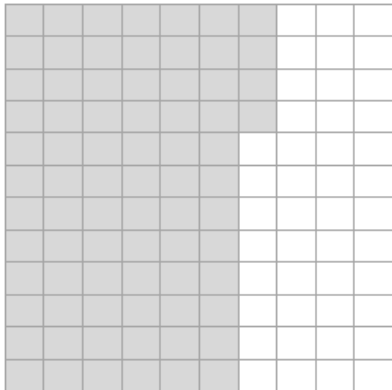
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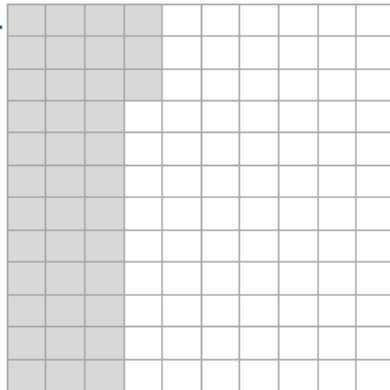
a. FCAT-Friendly Math Questions *(continued)*:

Which of the following diagrams represents the amount of area in the Reedy Creek Watershed that was wetland in 2004?

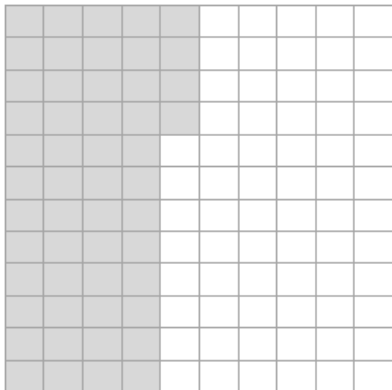
a.



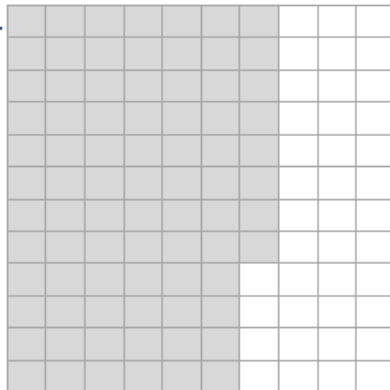
b.



c.



d.



Use the data in the table to calculate the total square miles of wetland in the Boggy Creek Watershed. Which of the following reflects this value?

- b. 6.3 square miles
- c. 11.9 square miles
- d. 22.0 square miles
- e. 43.5 square miles

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