

# SCHOOLS FOR CLEAN WATER

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#downrivermichigan  
#schoolsforcleanwater



## Model a watershed with your class

Model a watershed with your class! In this lesson, students will get to create a watershed model to observe how water runs through a landscape and how pollutants can get from our homes, streets, and schools into our rivers and lakes. A detailed lesson plan is provided.

### A Crumpled Watershed Model

- Best for grades K – 6.
- Estimated time for completion: 30 - 45 minutes.

#### Materials:

- 2 sheets of 8.5 X 11 in paper
- Spray bottle filled with water
- Washable markers (so colors run when wet). Choose two colors (red and blue work the best)
- Tray or towels to soak up water (This gets very wet!)
- Optional: One additional sheet of paper for note taking



#### Adaptations:

- This activity can be run with students working by themselves, in groups, or as a classroom demonstration. If running as a demonstration, teachers can prepare the second model drawing in advance to save time.
- This activity can be done using just one spray bottle. If using one bottle, a designated "raincloud" can move to each group and spray. While students are waiting for everyone to have their models sprayed, they can write down their predictions and observations.

#### Standards Met:

**KINDERGARTEN** **Interdependent Relationships in Ecosystems: Animals, Plants, and Their Environment**

K-ESS3-3 Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. \* \*\*

**3RD GRADE** **Weather and Climate**

3-ESS3-1 Make a claim about the merit of a design solution that reduces the impacts of a weather-related hazard. \*\*

**5TH GRADE** **Earth's Systems**

5-ESS2-1 Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.

## BACKGROUND INFORMATION

### Where Does Water Go When it Rains?

**DISCUSS:** When it rains, where does the water go after it lands on our houses, streets, and parks?

**Call on students to share their ideas, then explain:**

When lots of water enters our rivers, lakes, and streams in a very short amount of time, they can fill up and flood our neighborhoods.

**DISCUSS:** Why is it important to reduce our stormwater runoff?

**Call on students to share their ideas, then explain:**

Reducing our runoff reduces the amount of water that flows into our lakes and streams during storms. With less water, there is less of a chance of flooding.

**DISCUSS:** Why is it important that our runoff is clean?

**Call on students to share their ideas, then explain:**

The water goes directly into our streams where we like to swim, boat, fish, and where animals live. It does not go to a water treatment plant. The animals, plants, and us need clean water to be healthy and enjoy the water. Today we will model how water runs off of a landscape and has the potential to pollute our rivers.

### How Do We Reduce Stormwater Runoff?

We can reduce stormwater runoff by directing water to soak into the ground instead of running off of our streets. Directing gutters and downspouts into rain gardens and plants slows water, reduces flooding, and prevents trash and pollution from flowing into our rivers. Rain Gardens are specially designed gardens to soak up a lot of water. They are designed as a trough, so water collects into the trough rather than running off. In the trough we plant lots of native plants that like to soak up water.



*Today we will be modeling a watershed and stormwater runoff.*

## INSTRUCTIONS

1. First we are going to make our land. Everyone take the paper and crumple up in your hands.



2. Then, open it up, but don't flatten it completely. (It should look like it has mountains & valleys)



**DISCUSS:** What do you notice about your paper?

Are there any features that remind you about where you live or places you have seen?

3. If it were to rain on your land, where would the water flow? Take one marker and draw where you think rivers and lakes would form.

**DISCUSS:** Where did you draw lakes and rivers in your models? Why did you draw them there?



4. Now place your paper on the tray or on the town. We are going to make it rain! Take the spray bottle and spray a mist over your land. **Optional:** If only using one sprayer for the class, have students write down their predictions, observations, and questions during the "spraying time":

- Where do you predict the water will go and why?
- What do you see the water doing? Is it flowing where you expected?
- What is one thing you wonder about your model?

**DISCUSS:** What do you notice about where the water goes? Does it go where you thought it would? Why do you think so?



**DISCUSS:** What is missing from our models? (Looking for "people", but roads, trees, animals, etc. all work)

5. Now we are going to model how people influence our water quality. Set your first model to the side. Take your second piece of paper, and crumple and flatten it just like before.
6. Now draw where you think the lakes and rivers will go on this model using the same color as before.
7. This time, though, we are going to add some more detail to our model. We are going to draw three houses, two factories, and two businesses in our watershed to represent our community. Also draw pet waste people forgot to pick up, lawns with extra fertilizer applied, and fallen leaves. Anything you find in our streets, sidewalks, and parking lots. Draw these in a different color than your lakes and streams.



8. Place your new watershed on the tray or towels, and make it rain again! **Optional:** *If only using one sprayer for the class, have students write down their predictions, observations, and questions during the "spraying time":*

- a. What do you predict will happen with your houses, factories, dirt, and leaves you drew?
- b. What is happening to the colors? Is it flowing where you expected?
- c. What is one thing you wonder about your model?



**DISCUSS:** What do you notice? What is different about this model? What is the same?

**DISCUSS:** What does the different color runoff represent? When it rains, the rain carries with it all of the dirt, chemicals, leaves, and trash that are on the street into our rivers.

**DISCUSS:** How do you think we can help keep our rivers clean? *Possible answers:* Keep your local storm drain clean by picking up trash and leaves around it, plant native plants to soak up water before it runs into the storm drains, and dispose of household chemicals properly.

NOTES:



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