

SCHOOLS FOR CLEAN WATER CONTEST

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#schoolsforcleanwater

Take your class on a Stormwater Walk!

In this engaging lesson, students will practice their observation skills to study and grade their school's stormwater infrastructure. In the first activity, *Stormwater Tally*, students will walk around their school, identifying and recording features that can affect the amount of stormwater runoff. In the second activity, *Downspout Survey*, students take a closer look at how their school's downspouts can affect the amount of stormwater runoff. A detailed lesson plan is provided.



Goals of this activity:

- To learn what stormwater, runoff, storm drains, and downspouts are and how they are connected
- To be able to identify downspouts and storm drains around your school and neighborhood.
- To learn that it is important to reduce stormwater runoff to reduce pollution and flooding in our streams and lakes.
- To learn how to reduce stormwater by directing stormwater to plants and rain gardens, and preventing pollution by cleaning trash and leaves from storm drains.



Materials:

- Printed data tables (see pages 3-4)
- Pencils/pens

Adaptations:

- This activity can be run with students working by themselves, in groups, or as a classroom.
- If working with younger students, the activity can focus more on discussing observations and less on the data collecting.

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.

MIDDLE SCHOOL (GRADES 6 – 8)

Human Impacts

MS-ESS3-2 Analyze and interpret data on natural hazards to forecast future catastrophic events and inform the development of technologies to mitigate their effects.

HIGH SCHOOL (GRADES 9 – 12)

Human Sustainability

HS-ESS3-4 Evaluate or refine a technological solution that reduces impacts of human activities on natural systems.

BACKGROUND INFORMATION

Where Does Water Go When it Rains?

DISCUSS: When it rains, where does the water go? (e.g. goes into the ground, into rivers, etc.)

Call on students to share their ideas, then explain:

When it rains, the water either soaks into the ground, or it runs off into our creeks, rivers, streams and lakes. A watershed is the area of land that drains into a body of water, like a creek, river, or lake. Watersheds can be very big or very small. Today we will investigate the storm drains that carry the water directly from our streets into our creeks and rivers. Storm drains are the system of pipes that collect and transport water off of our streets and directly into lakes and rivers so our streets don't flood. You've probably seen the metal grates of storm drains in lots of places! The water that runs off of our streets, parking lots, and roofs into our storm drains is called stormwater. Downspouts are pipes that direct water from our roof gutters onto the ground.

Why Do We Want To Reduce Stormwater Runoff?

DISCUSS: What happens when lots of water goes into our rivers or lakes?

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.

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 observing our school's infrastructure to see how well it reduces stormwater runoff.

INSTRUCTIONS

Take a walk around your school. There are two observational activities you can do: Stormwater Tally and a Downspout Survey. Use the tables on the following pages to collect data (this can be done individually or as a class). Then, use your data to score how well your school did. At the end, explore and discuss ways to slow down stormwater.

STORMWATER TALLY: On your walk, observe and record things you see that can affect the amount of stormwater runoff. Use Table 1 to record your observations.

DOWNSPOUT SURVEY: When you encounter a downspout on your walk, stop and observe how downspout placement affects stormwater runoff. Use Table 2 to record your observations.



TABLE 1: Tally your Observations

Trees, flowerbeds, and gardens help slow stormwater so it can soak into the ground. Trees take up the water from the ground, and flowerbeds and gardens allow water to seep into the ground instead of running off pavement into storm drains.

Storm drains transport the rest of the water to a local creek or river to prevent flooding on sidewalks, parking lots and streets.

On your walk, keep track of how many trees, gardens, shrubs or flower beds, and storm drains you see around your school. Also keep track of the amount of litter you see – is there a lot, some, or none?

OBSERVATION	TALLY	TOTAL
Trees		
Gardens, shrubs or flower beds		
Storm drains		

How much litter do you see? (Circle one)

A lot Some None

TABLE 2: Downspout Survey

Downspouts are tubes that direct water from the roof gutters to the ground. Some downspouts empty onto grass, plants, or mulch. Others empty onto asphalt or concrete.

Grass, plants, and mulch slow down water by letting it soak into the soil, which reduces the amount of water flowing down our streets and storm drains. This reduces the pollution that is carried into our streams, and prevents flash floods in our local creeks and lakes.

For each downspout you see on your walk, record what surface it empties onto.

OBSERVATION	TOTAL
Grass, plants, or mulch:	(A)
Bare dirt, driveway, sidewalk, or street:	(B)
Storm drain, stream, or lake:	(C)
TOTAL DOWNSPOUTS (A + B + C):	(D)

SCORE YOUR SCHOOL: Now use your observations to score your school!

Stormwater Tally:

1. How many trees did you count?

- a. More than 5 (10 points)
- b. 3 to 5 (5 points)
- c. 1 or 2 (3 points)
- d. 0 (0 points)

2. How many gardens and shrub or flower beds did you count?

- a. More than 5 (10 points)
- b. 3 to 5 (5 points)
- c. 1 or 2 (3 points)
- d. 0 (0 points)

3. How much litter do you see?

- a. None (10 points)
- b. Some (5 points)
- c. A lot (0 points)

Now add it all up:

Question 1: _____

Question 2: _____

Question 3: _____

Question 4: _____

TOTAL: _____

Downspout Survey:

4. How many downspouts are directed onto grass, plants mulch or rocks?

_____ (A)

What is the total number of downspouts? _____ (D)

What share of the downspouts empty onto grass, plants, or mulch?

_____ (A÷D)

- a. They all do (10 points)
- b. At least half (5 points)
- c. Less than half (2 points)
- d. None (-5 points)

SCORING:

0 – 12 points: Needs work
 13 – 25 points: Average
 26 – 40 points: Great

FINAL DISCUSSION

- What does the school's score mean?
- What is the school doing well to reduce stormwater runoff?
- How can the school improve its score and reduce stormwater runoff?
- What can we do at home to reduce stormwater runoff and pollution in our lakes and streams?

NOTES:

Call on students to share their ideas, then explain: Direct downspouts to plants and rain gardens, clean trash and leaves from your local storm drain.



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