



Partners of Scott County Watersheds

School/Outreach Program Guide

About

Partners of Scott County Watersheds is a local nonprofit organization with the mission to improve the stewardship of Scott County watersheds through education, technical guidance, and volunteer opportunities.

This document outlines several programs that we can offer to local schools and organizations for free! Any of these programs can be modified to better fit the specific grade, unit of study, and classroom/campus.

To schedule a program, email us at info@partnersofscottcountywatersheds.org.

Table of Contents

Watershed Demonstration Model	1
Water Quality Testing with Chemical Parameters	3
Water Quality Testing with Biological Indicators	4
Soil Quality Demonstration	5
Native Plants	6
Trash Cleanup	7

Watershed Demonstration Model/ EnviroScape

Grade(s): 2nd-12th

Time: 30 minutes - 1 hour

Overview: Students will learn what a watershed is, common water pollutants, how they travel through and pollute watersheds, and ways they can make a difference.

Program Outline:

1. Introduction
 - a. What is a watershed?
 - b. What watersheds are we in?
2. Watershed Demonstration Model
 - a. Show the elements of the [EnviroScape](#)
 - i. Residential area, agriculture, golf course, factories, roads, streams
 - b. Pollutants
 - i. Ask students what they think pollutes our waters
 - ii. Place 'pollutants' on the model
 1. Green Kool-aid = fertilizer
 2. Red Kool-aid = herbicide/ pesticide
 3. Purple Kool-aid = factory runoff
 4. Coffee grounds = loose sediment
 5. Oatmeal = litter
 - c. Rainfall/ Pollutant Runoff
 - i. Ask students what they think will happen when it rains
 - ii. Start by lightly misting the 'town'
 1. Ask if students notice anything
 - iii. Use the cloud to demonstrate a heavy rain
 1. Have students share their observations (water pooling, pollutants in water, flooding)
3. Reflect
 - a. Have students look at the town; what happened when it rained?
 - b. What happened to the town; did it flood, loose soil, spread pollutants?
 - c. Have students look at the water; would they drink this? Play in it? Eat fish from it?
4. Watershed Demonstration Model 2
 - a. Reset the EnviroScape
 - b. This time, set up water management practices
 - i. Buffers between farm and pond, grass strips on loose sediment, sponges for rain garden and wetland
 - c. Have students make predictions about what will happen
 - d. Repeat the misting and rain
 - e. Have students share observations
5. Reflect

- a. Were your predictions correct? What happened this time?
 - b. Did the water quality practices help?
 - i. How did the wetlands/rain gardens improve flooding/ WQ?
6. Conclusion
- a. There are ways we can help improve our water. Even if you're not an adult, you can help protect our water by...
 - i. Picking up trash in your neighborhood
 - ii. Don't put things down the storm drain
 - iii. If you mow, keep grass off the streets

Program Example:



Water Quality Testing- Chemical Parameters

Grade(s): 5th-12th

Time: 30 minutes - 1 hour

Overview: Students will learn what a watershed is, common water pollutants, what water quality testing is and why it's important.

Program Outline:

1. Introduction
 - a. What is a watershed?
 - b. What affects a watershed?
 - c. What is water quality?
 - d. Equipment in the water quality testing kit
2. Testing
 - a. Split students into groups of 3-5
 - i. Have one student per group in charge of data collecting/clipboard
 - b. Go through worksheet as a group and conduct tests at the same time
 - i. Explain what each parameter is testing for/related to (i.e. pH measures acidity, chloride may be related to salt on roads)
3. Reflect
 - a. Review the chemical levels found
 - b. Are there any parameters that stick out? What could be causing them?
4. Conclusion
 - a. What is the water quality of the tested area?
 - b. What does this tell us about the area?
 - c. Why is water quality monitoring important?
 - d. What can we do to help improve the water quality?

Program Example:



Water Quality Testing- Biological Indicators

Grade(s): 2nd-12th

Time: 45 minutes - 1 hour

Overview: Students will learn about watersheds, water quality, and how organisms living in the water can indicate the water quality.

Special Notes: Requires access to a stream/ creek and favorable weather.

Program Outline:

1. Introduction
 - a. What is a watershed?
 - b. What affects a watershed?
 - c. What is water quality?
2. Biological Indicators
 - a. One way to determine the health/ quality of the water is by looking at what's living there. Specifically, scientists look at benthic macroinvertebrates
 - i. This is a fancy name for water bugs!
 - b. Go over common organisms
 - c. Discuss how to collect and ID the macroinvertebrates
3. Testing
 - a. Break students into partners and go to the water.
 - b. Have students collect organisms and place into collection containers
 - c. After collection, bring containers to a common area
 - d. Have students ID and record their findings
4. Reflect
 - a. What type of organisms were found?
 - b. Based on our findings, what is the health of this water?
5. Conclusion
 - a. Why is it important to have healthy water?
 - b. What can we do to improve the health of our watersheds?

Program Example:



Soil Quality Demonstration

Grade(s): 5th-12th

Time: 30 minutes - 1 hour

Overview: Students will learn the importance of healthy soils and how it affects our watersheds and communities.

Program Outline:

1. Introduction
 - a. Have students ever noticed there are different types of soils?
 - i. What are the differences they've seen?
 - b. What is soil quality and what do students think can affect it?
2. Demonstration
 - a. Show students two types of soil: one that comes from a tilled farm, and one from a prairie
 - i. Note any visual observations
 - b. Set the two containers of soil over a pan.
 - c. Share with students that you will be demonstrating a rainfall; what do they think will happen to the tilled and untilled soils?
 - d. Slowly pour water into the soils. Have students share observations
 - i. The tilled soil will not let much rain through, where the healthy soil will pass it all
3. Reflect
 - a. What differences were observed between the two soils?
 - b. Why do students think they took the water differently?
 - i. It all has to do with soil health
 - c. Imagine if our whole city has poor quality soil. What would happen if there was a big rainfall?
4. Conclusion
 - a. Why healthy soil is important
 - b. What students can do about it.

Program Example:

https://www.youtube.com/watch?v=Rpl09XP_f-w

Native Plants

Grade(s): 3rd-12th

Time: 30 minutes+

Overview: Students will learn what a native and non-native plant is and how/why native plants are important.

Special Note: Access to an area with native plants is preferred.

Program Outline:

1. Introduction
 - a. What does native and non-native mean?
 - b. What is an adaptation?
 - i. How do you think plants may have adapted to their habitats?
2. Program
 - a. Take students on a walk around campus. Point out native and non-native plants.
 - b. Have students make observations on the plants; do natives or non-natives have more pollinators, provide more shade, seem to do better in Iowa weather, etc.
3. Reflect
 - a. Discuss the students' observations. What did they notice about native vs. non-native plants?
 - b. Share with students how native plants are adapted to their environment and have co-evolved with the other organisms.
 - i. Ex: native grasses have long roots to withstand drought and fire, and also stabilize soil; native flowers provide more/better pollen to bees; native trees attract and provide more resources for birds
4. Conclusion
 - a. Why are native plants important?
 - i. How do they help improve the ecosystem and human life?
 - b. How students can plant native, remove non-native/invasive weeds, etc. to help promote native ecosystems.

Trash Cleanup

Grade(s): all

Time: 30 minutes+

Overview: Students will engage in community service and improve the health of our ecosystem by picking up trash. Students will also learn about data collection and trash makeup by recording what types of trash is collected.

Special Note: Cleanups can take place on campus or nearby; favorable weather is preferred.

Program Outline:

1. Introduction
 - a. Why is litter bad for the environment?
 - b. Safety & supplies
2. Program
 - a. Split students into groups of 3 or more.
 - i. One student will pick up the trash, one will hold the garbage bag, and one will record data. Students can switch roles throughout the cleanup.
 - b. Take students throughout the cleanup area, collecting trash and recording data as they go.
3. Reflect
 - a. Once the cleanup is done, have students tally their results.
 - b. How many types of trash were collected? What was the most common thing they picked up?
 - c. What other observations were made? Was trash mostly in one area? Where was certain types of trash found?
4. Conclusion
 - a. Determine how many bags/pounds/etc. were cleaned up.
 - b. Discuss how this helped improve the environment and ways students can pick up trash at home.

Program Example:

