

Activity: What's in the Water? Food Webs: Kit 480

Overview: This activity will teach students about storm water and how cities deal with it to prevent flooding. It will show how humans can create polluted storm water which can flow into our streams/ rivers, lakes and oceans and then have a negative impact on our water resources.



Benchmarks:

- 4.1.2.1.1 *Describe the positive and negative impacts that the designed world has on the natural world as more and more engineered products and services are created and used.*
- 4.1.2.2.2 *Generate ideas and possible constraints for solving a problem through engineering design. For example: Design and build an electromagnet to sort steel and aluminum materials for recycling.*
- 4.3.2.3.1 *Identify where water collects on Earth, including atmosphere, ground, and surface water, and describe how water moves through the Earth system using the processes of evaporation, condensation and precipitation.*
- 4.3.4.1.1 *Describe how the methods people utilize to obtain and use water in their homes and communities can affect water supply and quality.*

Learning Objectives:

1. Students will be able to explain how the current design of our cities can have a negative impact on water quality in our streams, lakes and oceans.
2. Students will be able to explain what stormwater is and the ways we can reduce the negative impact on our water resources.
3. Students will be able to explain what a raingarden is and how it helps reduce stormwater pollution.

Materials needed:

- 1 clear jar with lid
- Kibble/dry dog food
- Food coloring pack
(red, yellow, green & blue)
- Candy wrappers
- Dirt
- Cigarette butt
- Vegetable oil
- Grass or leaves
- Molasses

How to start:

To get students in the right mind set start with these anticipatory set questions:

- When it rains where does the water go?
- What about in streets and parking lots?
- Where does melting snow on streets and parking lots go?

Explain how the storm drain system works and the outflow can be into a river, lake or ocean. The “15 Minutes to the River” YouTube video from Michigan will help explain the connection between storm water and surface waters (<http://www.youtube.com/watch?v=GrBEEjijxaY>)

What happens when rain falls on a yard- what kinds of things can it pick up?

This activity illustrates possible contaminants that can enter surface waters. Start by adding water to the jar, then as each kid names a pollutant add the it to the container:

- **Dog/cat pet waste** (use dog food to simulate)
- **Pesticides**- add blue food coloring
- **Herbicides**- add a few drops of green food coloring
- **Grass/Leaves**- add them



- **Fertilizers**- add a few drops of red food coloring
- **Erosion/dirt**- add some soil
- **Litter**- add some paper/garbage
- **Cigarette butts**- add a cigarette butt
- **Oil**- add drops of red food coloring or molasses
- **Gasoline**- add some vegetable oil
- **Other car stuff**- yellow food coloring
- **Heat**- warm it with your hands or a gas grill lighter- think about walking across black pavement on a hot summer day.

Shake the container and ask them if they want to drink it or swim in it? **Where does it go?**

To help students understand what affect each of these pollutants has on a stream, lake or ocean they will complete the “What is the impact” research questions. You can print them off of the K-8 Storm water and Raingardens web site or have students work in pairs on computers/iPads.

Have students share, in either small or large groups, how these pollutants cause problems in the environment. In the Engineering Solutions part of the Worksheet, teams get to be creative and come up with a way to reduce or eliminate one of the stormwater pollutants. Students can share their solution either in small groups (gallery presentations) or in front of the whole class.

Wrap up:

Show the following video of current solutions and see if any of the students came up with something the same or similar: <http://www.youtube.com/watch?v=0x-TDvnbheM>

Solutions include:

- Raingardens
- Bio swales
- Natural Prairie Grass Yards
- Go through the storm water PowerPoint Presentation from Public Works (available on Raingarden Curriculum Website)
- This Website shares information about things you can do to reduce storm water pollution: <http://www2.erie.gov/environment/index.php?q=how-can-you-prevent-stormwater-pollution>
- This is another YouTube video about water and storm drains- H2O Jo <http://www.youtube.com/watch?v=ytq7DP9ENhU>
- Another video on storm water: <http://www.youtube.com/watch?v=Ak-js9MPSMU>

Follow up Activities:

Cascade Meadow would be a great place to go to for a follow activity- they have storm water management solutions built into their site to reduce runoff that affects our water resources.

Kids could also get involved in the Zumbro River Cleanup effort which takes place annually in July. Here is a news clip from July 2013: <http://www.kaaltv.com/article/stories/S3094266.shtml?cat=10219>

Students can also get involved in the “A Litter Bit Better” campaign to clean up Rochester. This activity happens every April and you can go to www.RNeighbors.org/litterbitbetter

