WATER POLLUTION IN OUR COMMUMNTY: WATERSHED TABLE PART 1

Keep Omaha Beautiful

Description:

Students learn how to prevent water pollution by modeling scenarios in which pollution enters waterways through the storm drains.

Objectives:

- Participants will understand how Omaha's local watershed contributes to regional, national, and worldwide water bodies.
- Participants will discover how an individual's can actions impact water pollution.
- Participants will brainstorm ways to mitigate water pollution.

Standards:

2nd Grade

- SC.2.13.3.B Compare multiple solutions designed to slow or prevent wind or water from changing the shape of the land.
- SS 2.1.2.d Investigate ways to be actively engaged to improve family, school, and community.

3rd Grade

- SS 3.3.3.c Explain the importance of Earth's natural resources.
- SS 3.3.3.d Describe how humans develop communities in local settings.

4th Grade

- SC.4.13.4.d Generate and compare multiple solutions to reduce the impacts of natural Earth processes on humans.
- SS 4.3.1.d Differentiate between classifications of bodies of water, cities, and
- land masses.
- SS 4.3.5 Use geographic skills to make connections to issues and events.

5th Grade

- SC.5.13.4.C Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment.
- SC.5.13.4.D Define a simple design problem that can be solved by applying scientific ideas about the conservation of fresh water on Earth.
- SS 5.3.3 Explain how human and natural forces have modified different environments in the United States and how humans have adapted.

All Grade Levels

- SS X.3.3 Describe relationships between humans and the physical environment.
- SS X.1.2.a Identify and model rights and responsibilities of citizens at the community level

WATER POLLUTION IN OUR COMMUMNTY: WATERSHED TABLE PART 1

Materials:

- Watershed table model and accessories - NOTE: please make sure all pieces are completely dry before packing up the model and accessories
- Scenario Cards
- Video
- Student Handout Page

Background:

As our population grew, agricultural land and sprawling cities replaced the natural landscape in Nebraska. Stormwater, once easily absorbed, now flows as runoff across the ground and over hard surfaces. Stormwater runoff occurs when precipitation from rain or snowmelt flows over hard surfaces, such as driveways, roofs, sidewalks, streets. The many hard surfaces in a city increase the speed and volume of water that reaches the stream and causes stream bank erosion.

Polluted stormwater runoff can occur anywhere people are using or altering the land. People going about their daily lives are the number one source of stormwater pollutants – and most people are totally unaware of it. Common examples of people contributing to stormwater pollution include: over fertilizing, excessive pesticide usage, not picking up pet waste, using salt or sand to de-ice driveways, allowing oil to drip out of vehicles and littering. Rainfall or snow melt washes these pollutants into the storm inlets where they discharge into nearby waterways.

Preventing pollution from entering waterways is much more affordable than cleaning polluted water. Streams and creeks feed into rivers, lakes and the ocean. Everyone uses and drinks water, so we are all affected when our water is polluted. When water treatment costs increase in order to filter and treat the water, the price of drinking water also increases. If you like to fish, swim or boat, you may have heard or been affected by advisories warning you not to swim, fish or boat in a certain area because of unhealthy water or too much algae – this is due to stormwater pollution. Businesses and homes can also be affected by stormwater whether you live near waterbodies or not – if the area around your establishment or home is not properly prepared for handling rainfall, you can risk a flood occurring from the runoff.

Many of the actions that cause water pollution are easily corrected. For example, encouraging residents to leave grass clippings on the lawn after mowing (and making sure to sweep clippings off of the street/sidewalk and back into the yard) can provide a natural fertilizer, reducing or even eliminating a need for chemical fertilizers. Additionally, simply cleaning up pet waste and litter can greatly reduce impact on waterways.

WATER POLLUTION IN OUR COMMUMNTY: WATERSHED TABLE PART 1

Keep Omaha Beautiful

Background (cont):

Some other ways to reduce water pollution:

- Maintain vehicles so they do not leak oil or other fluids.
- When washing a car at home, be sure to wash it on the grass or at a car wash, so the dirt and soap do not flow down the driveway and into the nearest storm drain.
- Do not over fertilize grass and never apply fertilizers or pesticides before a heavy rain. If fertilizer falls onto the driveway or sidewalks, sweep it up and throw it away or place back onto the grass. Make sure mulch, leaves, and grass clippings are not blown into or left in the street.
- Be sure to pick up all yard waste and place into a yard waste bag at the curb or use it as compost to prevent yard waste from entering into the nearest storm drain.
- Pet owners should pick up after their pets and dispose of pet waste in the garbage.
- Keep lawn and household chemicals tightly sealed and covered in a place where they will not get rained on. Dispose of old or unwanted chemicals at Under The Sink at 4001 South 12th Street. Visit http://www.underthesink.org/ for more information.
- Never put anything down a stormdrain.
- And, of course, do not litter.

Activity:

1. Have the students help set up the city – storm drain in the drain holes first, then houses in the neighborhood with the trash can and raccoon; dog in the park area, bridges, restaurant, trees, etc. (Do NOT at the felt pads or sponges at this time.)
2. Add about an inch of clean water to the “lake” (one of the small, clear plastic bins) and put the fish and turtles in it before putting it in it’s spot under the watershed table.
3. As you are assemble the city, discuss what a storm drain is and how the water flows down the storm drains and into creeks, lakes, and rivers.
4. Distribute scenarios to each student or group of students (there are 8 scenarios). Each group should read their scenario and make sure they fully understand it.
5. Have each group present their scenario to the class and then add “pollution” to the city. If possible, students should not read the scenario word for word, instead they should paraphrase and restate it in their own words. Do NOT discuss how to solve the problems yet. As students present their scenarios, ask questions to help students relate to the scenarios, such as: How many of you help mow the lawn? Have you ever had raccoons get into your trash? Do you have a dog? etc.
6. After the addition of each type of pollution, use the spray bottle to “rain” on the city.

WATER POLLUTION IN OUR COMMUMNTY: WATERSHED TABLE PART 1

Activity (cont):

7. After all the pollution has been added, and it has "rained" on the city (make sure there is enough rain to wash the pollution into hole in the bottom of the lake), use the plug to stop up the lake. Remove the tray at the bottom of the "lake" and look at the water. Ask the students to compare this water to the water they saw at the beginning of this activity.

8. Have students work in their groups to answer the questions on their handout. Possible ways of mitigating the pollution are:

- Scenario 1 – use the pesticide on a day that is not windy; follow the directions on the pesticide bottle about how much to use; avoid the pesticide if possible
- Scenario 2 – take the oil to Under the Sink
- Scenario 3 – clean up after the raccoons; make sure the trash has a lid; tie trash bags shut
- Scenario 4 – sweep grass clippings back into the yard; sweep grass clippings into a yard waste bag
- Scenario 5 – clean up after your dog
- Scenario 6 – take the trash inside; take the trash home and recycle what you can
- Scenario 7 – mulch the grass onto the lawn so you don't need fertilizer, use organic fertilizer; make sure to sweep extra fertilizer back into the lawn; do not over apply fertilizer
- Scenario 8 – take the car to a car wash (then the water goes into the sanitation sewer system, not the storm drain system)

9. After completing their handout, lead a class discussion. Ask students why we should care about any of this. How does this affect them? Some suggestions:

- Healthy water for us to drink – we will get clean water from our tap, but the more pollution that is in it, the harder it is to clean.
- Healthy ecosystems for animals – and we need the animals to have a healthy ecosystem in order for us to have a healthy place to live
- Parks and water for recreation – hiking, fishing, swimming, boating, etc.
- Economics – if we spend time for recreation in water, we also spend money in places where there is good water; tourism is a big deal around good water

Assessment:

Completed student handout page