



# 2nd Grade Unit

## “Stormwater Pollution”

*Objective: To introduce 2nd grade children to the concepts of stormwater, porous and impervious surfaces. This unit also explores what pollution is and how it can harm the environment and how soil can be a factor in keeping pollution out of local waterways. This unit was developed to be used as an extension of the Changes and Soils Science Kits.*

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### Materials and supplies to support this lesson:

- ◆ Coloring page\*
  - ◆ “What goes down the storm drain?” pdf or hand-out \*
  - ◆ Funnels, coffee filters, potting soil, food coloring\*
  - ◆ Sand, oil and clear jars
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### Lesson 1: What is stormwater pollution? How does it change water quality in rivers, streams and lakes?

What is stormwater and what is stormwater pollution? Stormwater is rain and surface water that runs off nonporous (impervious) surfaces and flows through open ditches or underground pipes directly into streams and rivers. In cities, stormwater runs off streets, sidewalks, roofs and parking lots. All of these surfaces are solid and rain cannot soak into them like it can soak into the ground. These surfaces are “impervious.” When rain runs across these impervious surfaces, it collects pollutants like oil, grease, dirt, fertilizers, animal waste and litter and carries them into the storm drain. These pollutants are carried with the rain directly to streams and rivers. Stormwater DOES NOT get cleaned before it goes back into the river!

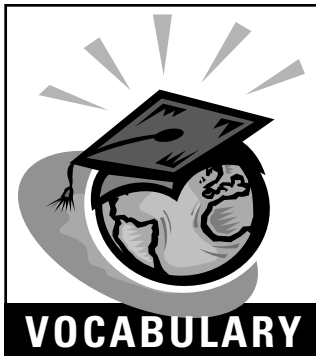
We use our rivers for many activities like swimming, fishing, and boating. Some cities get their drinking water from

rivers. Wild animals also drink from creeks and rivers. So, it is important that we keep rivers clean!

**Exercise:** Take students into the school parking lot on a rainy day and have them observe a storm drain. Do they see any pollutants being carried along with the stormwater down the drain? Have the students compare what happens to rain that falls on the lawn to rain that falls on the pavement. Does the rain soak into the pavement? Does it soak into the lawn? Explain that the grass growing in soil has roots that can soak up water like a sponge and the that soil filters the water.

**Handout:** Share the “What goes down the storm drain?” page. Have students identify trash and pollutants that are in the water. Explain that the storm drains they looked at in the parking lot are connected to underground pipes (like the pipe in the picture) and that the trash and pollutants were carried with stormwater through the pipe and dumped into the river.





drinking water  
runoff  
water treatment  
storm drain  
wastewater  
pollutants  
oxygen  
stormwater  
filtration  
amphibian

**Activity 1:** Hand out the coloring page. After the students have finished coloring, tape the finished pages on the wall and ask them the following questions:

Do they see any activities on the coloring page that may hurt the fish and ducks in the stream.?

Where will the oil being dumped in the street go?

**Brainstorm:** Discuss storm drains and storm drain systems. Ask students to look for storm drains as they walk home from school, are on the school bus or in a car. Did they see any pollutants or trash in the streets or gutters that could be washed down the storm drain? Make a list of any trash or pollutants they saw on the chalk board. Identify local water sites that storm drains empty into (Amazon Creek, Willamette River).

## **Lesson 2: What are pollutants and how do they harm plants and animals?**

Pollutants are anything that damage our water, air, and soil. Pollutants are often harmful to humans, plants, and animals. Most pollution is caused by people, but some pollutants are natural. Some pollutants are easily seen. For example, it is easy to spot litter or an oil slick on a pond. However, many pollutants cannot be seen. It is important to realize that clear water isn't necessarily free of pollutants. The pollutants can only be detected by testing the water.

Pollutants can cause many types of problems for humans, plants, and animals. When pollutants like oil enter our rivers, lakes, and streams, the oil can kill fish and make the water undrinkable for animals. Another example of a pollutant

is dirt, which enters the storm drains from construction sites. The dirt makes the water muddy, and fish cannot live in muddy water! Fertilizers entering our water system can cause plants like algae to grow in excess. The algae uses up lots of oxygen in the water, leaving very little oxygen for the fish. Some pollutants can cause tumors and growth defects in fish and amphibians (frogs).

**Handout:** Hand out a picture page showing organisms that have been harmed by pollution. Discuss the importance of keeping water clean.

## **Lesson 3: Can soil clean the water?**

During their visit to the parking lot, students observed that rainwater flows off impervious surfaces into storm drains, which carry pollutants directly into local waterways. But what happens when those pollutants flow into lawns and other planted areas? Rainwater that falls on planted areas soaks into the ground. Ask the students if the ground can clean the water if the water is polluted.

**Activity 1: *Exploring Water Filters.*** By watching this simple demonstration, students can see that pollutants in water can be filtered by soils.

### **Materials:**

- 3 glass jars
- 1/2 cup of sand
- food coloring
- 2 plastic funnels
- 1/2 cup of potting soil
- coffee filters
- large cup
- 2 teaspoons of oil

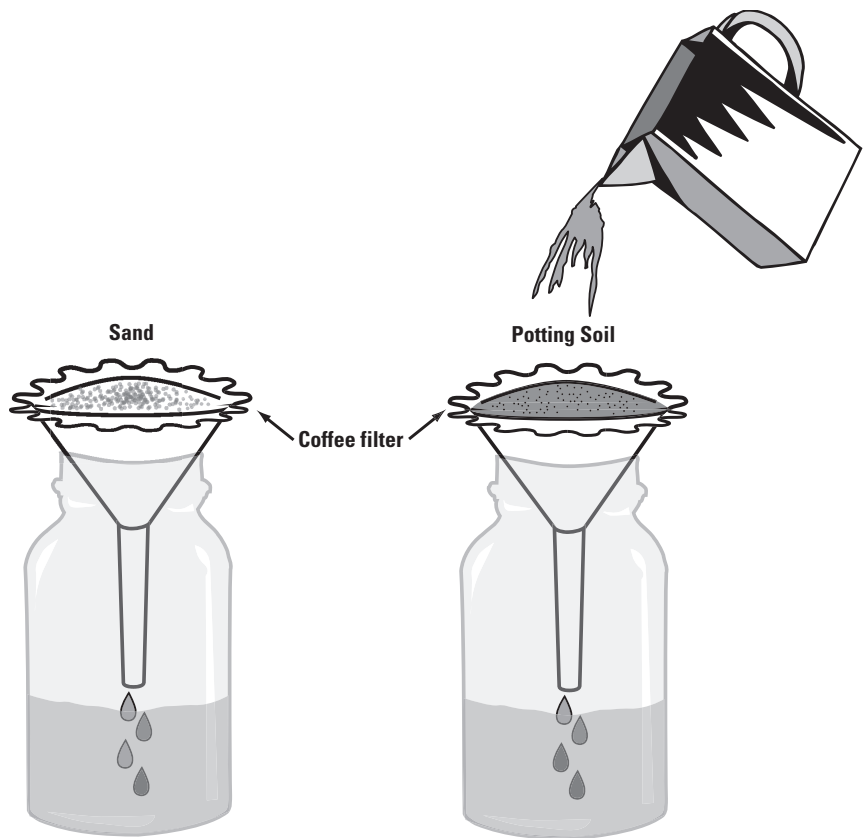
Create soil filters by lining each funnel with a coffee filter. Fill the first funnel half-way with sand; the second funnel half-way with potting soil. Place each funnel over an empty jar. In the third jar, mix three drops of food coloring with 1 cup of water. Pour half of the mixture into the funnel with sand, the other half into the funnel with potting soil. After the water has filtered through both funnels, record student observations of what they see in the jars.

Empty the two jars and repeat the experiment using a mixture of water and oil.

Record the students' observations on a worksheet and then ask the students the following questions.

1. Which is a better filter: sand or potting soil?
2. Which substance (colored water or oil) was easier to filter out?
3. Where are the "pollutants" that were in the water?

**Brainstorm:** What are some things that can be done to help keep stormwater clean?



*Using sand and potting soil, students can observe how soil can filter pollutants from water.*

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### Also available for your classroom:\*

SPLASH! Songs CD with songs for children written and performed by Rich Glauber. Lyric sheet is online.

Schedule a visit from Lily the Frog, our stormwater mascot. Lily can visit your classroom to meet your students and help them learn about the wetlands where she lives.

Call or e-mail for details. \*

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SPLASH! was developed by the City of Eugene Stormwater Management program to support education about water quality in our community. This program is funded by City of Eugene stormwater user fees.

\* For more information, supplies for use with these lessons, the SPLASH! Songs CD, or a visit from Lily, contact [jeffrey.j.flowers@ci.eugene.or.us](mailto:jeffrey.j.flowers@ci.eugene.or.us) or call 541-682-8482 (Eugene schools only)

**SPLASH! classroom materials are online at [happyivers.org](http://happyivers.org)**







# HELP KEEP OUR RIVERS CLEAN.

# WE ALL LIVE DOWNSTREAM!

