

# **UNIT 4:**

## **Down the Sewer**

# Teacher's Notes

## Down the Sewer

### Background Information

Water in storm drains is not treated before it empties into local waterways. Anything put down a storm drain will end up in our water. Many types of pollution can be traced back to storm drains and our lack of knowledge may be putting not only aquatic habitats in danger, but also ourselves.

One drop of oil pollutes 25L of water (that's thirteen 2L pop bottles) so that it is no longer safe for people to drink and it hurts animals and plants.

Two 2L pop bottles of oil (about the amount used in a regular car's oil change) can cause a 3.5-hectare oil slick. A lake or stream can accommodate a little pollution without throwing off the balance, but lakes today are beyond that point. Therefore, we have to use **prevention** as our primary plan of action.

Pollutants can be considered as non-persistent, persistent and other. Non-persistent wastes degrade over time and include sewage and fertilizers. There are bacteria that break down these substances. Persistent wastes include pesticides (like DDT), petroleum (oil), metals, and radioactive materials. These wastes are piling up in lakes and streams and don't really go anywhere, as they do not break down. Chemical threats can affect habitats and the life cycle of various animals and plants, in some cases even altering the genetic makeup of those animals and plants.

Other pollutants, like foam and floating debris, do not pose environmental hazards but are physical pollution that may interfere with the aquatic habitat and are indicators that other sources of pollution are present. For instance, large amounts of foam on the water's surface may indicate increased amounts of phosphate present in the water. These phosphates can be introduced from detergents used on land (e.g. washing the car on the street; the water goes into the storm drains). Phosphates occur naturally in the environment but a large amount being introduced into the environment poses an imminent problem. Phosphates act as fertilizer, increasing the growth of plants. Large algal blooms (greenish looking water) can result from the introduction of extra phosphates. The plants can physically block off the water channel, reducing the flow of the water as well as hampering migration of aquatic species. These aquatic plants as they decompose will rob the water of oxygen; thus affecting a number of aquatic species that rely on dissolved oxygen to survive.

The plastic 6-pack rings, like the ones on pop or beer cans, pose a hazard to birds on land and in water. Not only do they litter birds' habitats, but birds can also get caught on the rings. When you throw rings out, snip them and make sure they go in the garbage or recycling bin (some municipalities recycle them). Do NOT throw ANY objects into the storm sewer.

***The storm drain is not a garbage can! Please put garbage where it belongs - in a can, a recycling box, or a hazardous waste depot.***

### Overview of Activity:

Students wear gloves and categorize a variety of hazardous and non-hazardous waste material. Students learn the meaning of the warning symbols that are commonly used on many household items (e.g. poison, flammable etc.) to emphasize safety. There is a brief discussion of the effects of dumping household hazardous wastes in the storm sewer or down the drains inside the home. Students will learn about what happens to water that washes off our streets, sidewalks, parking lots and roofs and go into the storm drains. Water from drain sewers is not treated like other wastewater. Anything that you put down a storm sewer will reach your drinking water (so nothing should go in it except clean water). Alternatives to using hazardous chemicals in the home are discussed as well as where to properly dispose of hazardous waste materials. Students are encouraged to link the results of their actions with pollution and its effects on other living things.

# Down the Sewer

---

## Outcomes:

### Energy and Control, Grade 3 (Forces and Movement)

- Identify objects, devices and systems in everyday life that are affected by forces and movement and explain in what ways they are useful to us

### Life Systems, Grade 4 (Habitats and Communities)

- Describe ways in which humans can affect the natural world (e.g. pollution, affects on watercourses and groundwater supplies, endangering living things)

## Discussion:

**Q Does everybody know what a storm drain is?**

*A These are the sewer drains on the side of the road along the curb, or in the gutter.*

**Q Has anybody ever looked down the storm drain? What did you see down there?**

*A A lot of what's down there is very bad for the natural environment.*

**Q Has anybody seen the yellow fish painted near the storm drains?**

*A Fish drawn near the storm drains are put there to remind citizens that whatever goes into the storm drains goes into fish's homes. We are going to learn more about storm sewers today*

Unlike household waste collected via sanitary sewers, the water that goes into storm sewers is NOT treated at the sewage treatment plant.

**Q What does this mean?**

*A It goes right into the natural waterways like lakes and rivers. If it's dirty, it can kill plants, birds, fish and other animals. Eventually it will come back to us as the water we drink or wash with.*

**Q Ask students to explain recycling. Does anybody know what hazardous means?**

*A It means dangerous, almost like poison.*

**Q Do they know what hazardous wastes are?**

*A It means dangerous materials, like poison that are no longer needed and need to be disposed of properly.*

## Activity

### Materials Needed:

- Containers (garbage, hazardous waste, recyclable, plastic rings for pop cans)
- Garbage can
- Vinyl gloves
- Various signs: hazardous waste; garbage; recyclable; safe for storm drains

## Procedure:

Students must wear gloves when handling materials. They then sort out the pile of common materials thrown in the storm drains and separate them into the various categories.

1. Safe to put in the storm drain
2. Garbage
3. Hazardous wastes
4. Recyclable

## Follow up:

After the sorting is done, go through each category and hold up the items one at a time. Is this really garbage/hazardous waste/recyclable? Of course, this varies with each item. It will become painfully clear that NOTHING should be dumped into the sewers.

Review the symbols on the hazardous waste containers as they are held up and ask the students if they know what each symbol is.

**Q Ask them to explain why they are hazardous (ex: corrosive, explosive, etc.), or if they don't know, provide a brief explanation of the symbol.**

*A Emphasize that these substances are hazardous to people AND ecosystems.*

**Q What happens if we pour or put things in the sewer that don't belong there?**

*A They end up in our waterways; they poison plants, birds, fish and other animals. Eventually, they will poison us, too!*

**Q What's the message we should tell our friends and family?**

*A The sewer is not a garbage can. Do not pour hazardous chemicals into the sewer or down the drain at home.*

**Q Do we need to use hazardous materials? Not necessarily.**

*A There are many alternatives to hazardous materials. There are lots of books that list pesticide-free substances for gardens and homes and non-toxic cleaning products, which are healthier for people too. Some stores sell these ready-made. Free booklets are available at many places, which tell you how to make your own alternatives. You can call places like Greenpeace, Ministry of the Environment or your municipality and they would be glad to suggest alternatives. Preventing pollution starts with you!*