



RUNAWAY RUNOFF

I Objectives

- a. Students will be able to define runoff.
- b. Students will identify several types of pollutants and how they can be introduced into the environment.
- c. Students will discover why contaminated runoff is harmful for the environment.
- d. Students will discuss solutions to prevent runoff from becoming contaminated.

II. Materials

- a. 4 Paint pans, 4 large bags of soil, 4 trowels, 4 large spray type water bottles
- b. 4 each of the contaminants: soap, oil, fertilizer, salt
- c. 8 magnifying glasses and 8 spoons
- d. Data sheets

III. Lesson

- a. Before we get into today's lesson, I would like to tell you a little story.
- b. Today we will be discussing runoff. What is runoff? (Allow students to answer.)
 - Runoff is defined as rain that has fallen off roofs, down curbs, across lawns, or any elevated place onto the ground.
 - Runoff can also be called storm-water, or storm-water runoff.
 - As runoff collects, it begins to find its way down the lawn, driveway, or street. As it flows, it is constantly picking up or collecting pollutants and debris. Eventually it flows into the storm drains, which empty out into our lakes, rivers, streams, oceans, and playa lakes! Remember this water was not treated; it collected all types of nasty stuff and then went directly into our lakes, rivers, streams, oceans, and playa lakes!
- c. What kinds of pollutants are in storm-water runoff? (Allow students to answer.)
 - It could be all kinds of things. Here is a list of some of the more common pollutants:
 - Sediment, fertilizer, pesticides, motor oil, detergents, soaps, grease, metals (lead, copper, zinc), leaves, grass clippings, pet waste, and even litter!
- d. How do these different types of pollution become part of the storm-water runoff?
 - Improper use or disposal of fertilizer, pesticides, and herbicides causes pollution: This could allow the substance to be exposed to runoff. As soon as it rains, there it goes running away with the runoff.
 - Yard clippings not composted or even thrown down the storm drains: This can cause the drains to clog up and prevent the water from entering the storm drain.
 - Working on your car or truck at home:
 1. If you allow oil, antifreeze, brake fluid, or any type of fluid to leak onto the ground, the chances are pretty good you will cause some pollution.
 2. Even washing your car can be a problem. Think about all the soap, dirt, and grime that wash off your car. Where does all that stuff go? It can go onto your driveway, the street, or even your lawn. As soon as it rains, you got it, it becomes runoff.
 - The list could go on and on. What about all the cleaning supplies we use around our house? Do you dispose of them properly?

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e. It is very important for you to remember that all of this polluted water is someone's drinking water. It isn't our drinking water, or is it? Where does our drinking water come from, is it polluted? Does this pollution affect the animals that live in or live around playa lakes? Could the groundwater become contaminated?

f. What can you do to keep runoff from becoming polluted?

-Never dump anything that you would not want to drink or swim in, onto the street, down a storm drain, or into a drainage ditch.

-Dispose of all chemicals and trash properly.

-Recycle, Recycle, Recycle!

-Clean up any leaked or spilled fluids from your automobile, and dispose of them properly.

-Be sure your car is in good working order and that it does not leak any type of fluid.

-Use environmentally friendly soaps and detergents for all your washing and cleaning.

-Pick up all pet waste and place it in a dumpster.

-Give a hoot and don't pollute!

IV. Activity

a. If we wanted to study runoff or how water becomes polluted, how would you set up your experiment? (Let students answer.) Today we will be conducting our experiment based on the scientific method.

Here are the steps to the scientific method: 1) state the problem, 2) make a hypothesis, 3) plan an experiment, 4) record your results, 5) conclusion.

b. Today we will be experimenting with runoff. We want to see first hand what happens when different types of pollutants come in contact with the soil. What if plants were growing on the soil, or if a river, lake, or stream was near by?

c. Divide the class up into four groups. Each group should have each of the following:

-1 Paint pan, 1 large bag of soil, 1 trowel, 1 bag of pollutants, 1 bottle of water, 2 magnifying glasses, 2 spoons, and 1 data sheet per student

d. Activity

1. Line the sloped portion of the paint pan with about 1 inch of dirt. Try to smooth it out a little bit.

2. Pour out each pollutant onto the dirt.

3. Make a hypothesis about what will happen to the pollutants if they are rained on. Do not forget that sometimes it does not rain very much, and sometimes it really rains hard! Write your answer down on the data sheet. Tell the students this is just a guess; there is no right or wrong answer.

4. Next, spray the contaminants with "a little rain." Did anything happen to the pollution? Now, record your observations on the data sheet.

5. Spray contaminants with "a heavy rain". Record any observations on the data sheet.

6. Take the spray nozzle off the bottle and pour the rest of the water out over all the dirt. Now record your observations. Did the pollution go anywhere?

7. Next, using the magnifying glasses and spoons to let the students explore the wet soil. Did any of the pollutants make their way down into the soil, how do you know? Record your observations. How might this effect plants, animals, or groundwater?

8. Clean up...

V. Conclusion

a. How did the model we just made represent the real or natural world?

b. Can our resources become so polluted that we could not use them?

c. Can anyone tell me what they learned and what they will do differently in the future?

Name:

Date:

Runaway Runoff

1. What were/are the pollutants used in this experiment?
2. Make a hypothesis: What will happen to the pollutants if it rains? How does that affect our water supply and the environment?
3. Record what happened after a light rain.
4. Record what happened after a heavy rain.
5. Conclusion:
Compare the results of your experiment with your hypothesis. Do your results agree or disagree with the problem from question 2? What have you learned?