

Yellow Fish Road™

Suggested Activities for
Elementary Levels



Trout Unlimited
Canada



YELLOW FISH ROAD™
TROUT UNLIMITED CANADA

2010 Trout Unlimited Canada

Sum of the Parts

Suggested Level:

Grades
6 - 8

Time

required:
30 - 50
minutes

What would you do with an empty piece of waterfront property and two million dollars? Students draw this in small groups, then come together to see that their pieces of land are all along the same river. This is one of the best activities we have found to show the cumulative effect of polluted runoff and storm drain pollution.

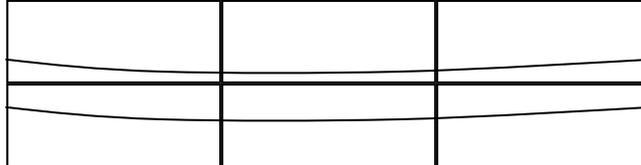
Objectives

Participants will:

- determine the sources and effects of pollution on an ecosystem level
- identify sources of polluted runoff and recognize that everyone is responsible for protecting water quality in rivers, lakes, and streams
- brainstorm ways to minimize polluted storm water runoff in a watershed
- develop an appreciation for the importance of water quality to humans and aquatic organisms

Materials Needed

- Poster paper, newsprint or butcher paper. Draw a river on the paper as shown and number the pieces so that they can be put together to form a river (each piece must include a part of the river)
- Markers and pencils
- Small items to use as pollution (paper clips, pencils, marking pens, etc.)



What to Do

1. Inform participants that they have each been given 20 million dollars to develop a 20-acre parcel of riverfront property. They can develop the property as they wish. The line on each piece of paper indicates water and the empty space is their land.
2. Hand out one piece of paper per team of 2-5 students. Ask participants to draw a diagram of what will be on their property, from a “bird’s eye” view.
3. You can make suggestions of components to consider: access, infrastructure (roads, power, plumbing), landscaping, plants, animals, garbage collection, etc.
4. What is the main purpose of the development – a farm, ranch, resort, factory, park, mine, residence, etc.?
5. You may wish to give parameters to work within (e.g. they must include a road, a building, etc.) or roles to play (e.g. farmer, rancher, suburban dweller, etc.).



6. Give teams 10-15 minutes to decide and draw. Circulate and help to guide their developments. Ensure that participants are specific about the uses of their land.
7. When they have completed their drawing, have the teams list all of the uses, users (you may want to prompt them to include human and wildlife users) and sources of pollution on their land. Have students list these on a white board.
8. When participants have completed the lists of uses and users, explain that their properties are all adjacent to one another on the same river. Have participants form one large river on the floor by matching up their pieces to (matching numbers, starting with number 1 on the left hand side). Ask the participants to sit or kneel by their drawing, but everyone must be able to see the entire river.
9. Decide which direction the river is flowing. Starting at the head of the stream, each team explains their drawing to the entire class, and tells the class who uses their piece of land and some of the pollutants that will run off their land and into the river. For each pollutant give the group an item representing pollution to put onto their part of the river. You can add markers, pencils and/or paperclips for pollutants the group has not considered.
10. After the two groups in the first section finish, they pass all of their “pollution” downstream to the next section of the river. This will continue, until the last two groups at the end of the river are left holding all the items.
11. At the end, examine the “pollution” pile from polluted run off and storm drain pollution. This is a great representation of the cumulative affect of storm drain pollution and polluted runoff. All of us contribute to polluted run off and storm drain pollution and there are hundreds, even thousands of sources of the same pollution in any urban area (fertilizer, pet waste, soap from washing cars, litter, etc.).
12. Wrap up by asking participants which end of the river they would rather own property on. What impacts did the developments have on the river? What impacts did the movement of the pollution have on the downstream developments?

Extension

If there is time, or as a follow up to this activity, ask participants to add to/change their development plans to mitigate the pollution they have caused. Bring all the drawings back together and have each group present the actions they took to minimize their pollution.

Modified from *Project WET Curriculum and Activity Guide*. <http://projectwet.org/water-education-project-wet/project-wet-publications/project-wet-curriculum-activity-guide>

Consider saving the drawings for use in the "Fred the Fish" activity.



Fred the Fish

Suggested Level:

Grades
2 - 4

Time
required:
20 - 30
minutes

Prior to this activity students should understand what storm water pollution is and why it is important to prevent it. Students will follow Fred (or Fran) the Fish down a stream as it becomes polluted from storm water runoff. Students observe how everyday activities can pollute the stream and eventually make Fred sick.

Objectives

Participants will:

- Identify sources of storm drain pollution in their community
- Understand that storm drains connect to rivers, lakes and streams

Materials

- One large (at least 2 liter) clear plastic container (or fish bowl) with a large mouth
- One sponge (approx. 11cm x 7 cm). Cut the sponge into the shape of a fish, or print and laminate a photograph of a trout
- Fishing line (about 8 inches)
- Fishing weight or stone (heavy enough to suspend the fish in water. Approx. 115g or 4 oz.)
- One small container of soil
- One small container of syrup
- One small bottle green and also red food coloring
- One small container of liquid dish soap
- One small container chocolate sprinkles
- Paper punches from a hole puncher or shredded paper

What to do

1. Attach the fishing line or string to the fish-shaped sponge.
2. Attach the fishing weight or stone to the fishing line below the fish. Fill the large container with water and secure the fish-shaped sponge to the bottom with the weight and fishing line.
3. Working with the students, draw a winding river on a very large piece of paper. Use poster paper, several pieces of paper side-by-side, or use the watershed created in “Sum of the Parts” (page 2). Make sure your drawing includes these landmarks in this order: The drawing of the river and the landmarks is your ‘game board.’
 - Nature preserve
 - Construction site
 - Neighborhood
 - Highway bridge
 - City park
 - Another neighborhood
 - A stream that joins the river
 - A trash pile on the river bank
4. Show students the container with the fish-shaped sponge and introduce the fish as Fred



(or Fran) the Fish. Put Fred's container next to the nature preserve.

5. Tell the students that Fred/Fran has grown up in a protected river in a **nature preserve** but she is about to leave the preserve and journey downstream. The students are invited to share her adventures. Ask the students to note how Fran and the water in the jar look before moving on (the water is clear, no pollutants).
6. Move the container along the river to the **construction site**. Tell the students that *"there is a lot of soil where some construction workers have been getting ready to build a new mall. It starts to rain and some of the soil is washed into the stream."* Have a student add a teaspoon of dirt into the fish container. Ask the students, *"How is Fred?"*
7. Move Fred to the neighborhood and tell the students *"Fred swims next to a **neighborhood**. Some fertilizer from lawns and gardens washed into the river a few months back. The fertilizer made the plants in the river grow very fast and thick. The plants are using up some of the oxygen that Fred needs."* Have a student add a drop of green food coloring to Fred's jar. Ask, *"How is Fred?"*
8. *"Fred swims under the **highway bridge**. Some cars traveling across the bridge are leaking oil which is washed into the river."* Have a student add some syrup to Fred's jar. *"How is Fred?"*
9. *"Fred swims near the **city park**. Some picnickers don't throw their trash into the garbage can and the wind blows it into the river."* Have a student add some paper punches or shredded paper to Fred's jar. *"How is Fred?"*
10. *"As Fred swims next to the **neighborhood** he sees bubbles floating on the water. The bubbles are coming from a pipe that takes storm water from the neighborhood and empties it into the river. Someone is washing their car on the street and the soapy water is running into the river."* Have a student add a few drops of soap to Fred's jar. *"How is Fred?"*
11. *"Up ahead, a **stream joins the river**. Fred wants to swim fast through this stretch because he knows that the stream runs along a trail where people do not pick up after their dogs."* Have a student shake some chocolate sprinkles into Fred's jar. *"How is Fred?"*
12. *"Finally, Fred swims past a **trash pile** where people have dumped everything from soda bottles to paint cans. Some of this trash can really hurt fish and other animals who depend on the river."* Have a student add a few drops of red food coloring.
13. Afterward, save Fred/Fran by moving her back upstream. At each pollution source stop and take suggestions for how we can keep the pollution from getting into the water.

Modify these landmarks to your own city or town!

There are several versions of Fred/Fran the fish. This version is adapted from http://www.capecodgroundwater.org/festival_activities/Fred_the_fish9.12.pdf



Water Quality Limbo

Suggested Level:

Grades
4 - 8

Time

required:
40 minutes

Using the limbo game, students explore how storm water becomes polluted and what can be done to eliminate or reduce polluted runoff. The limbo bar is used to demonstrate how our daily choices affect water quality. As water quality declines, the bar is lowered, as it improves the bar is raised.

Objectives

Participants will:

- Understand how human activities affect water quality
- Identify ways that they can help reduce/eliminate water storm water pollution
- Understand that storm drains connect directly to rivers, lakes and streams

Background

Students should have discussed water pollution and be able to list several ways that our daily activities can result in storm water pollution. Explain that storm drains are found on streets, highways and parking lots in thousands of towns and cities across Canada, North America and the world. These small grates increase our safety by draining rainwater and snow melt from paved areas and emptying that water into rivers, lakes and streams. The key to understanding the importance of storm drains is to understand that they do not connect to water treatment plants. Everything, including pollutants caused by our daily actions, that goes into a storm drain is emptied into a lake, river, or stream.

Materials

Index cards (approximately 30)

Marking pens

Flip chart paper

Broom stick, wooden dowel, or rope to use as a limbo bar (approx. 1.5 meters long)

What to Do

1. Post the flip chart paper on a white board and draw a line down the center of it. On one side of the chart write 'Pollution' on the other side write 'Solution.'
2. Help the students brainstorm a list of actions or items that can cause storm drain pollution and write these on the 'Pollution' side of the chart. On the 'Solution' side of the chart write down the actions that can prevent the pollution. Here are some suggestions:

Pollution

Pet waste

Litter

Washing car in driveway

Sweeping/washing driveway dirt into street

Solution

Bag and throw pet waste in trash

Pick up litter, throw in trash can

Go to a commercial car wash

Sweep up dirt

3. Give each student an index card and assign them either a pollution source or a solution to write on the card. Collect the cards and shuffle them. (You can also prepare the cards ahead of time.)



4. Tell the students they will use a game of limbo to help them see how our daily activities can cause – or prevent – storm water pollution.
5. Give the students a few stretching exercises and select 2 students to hold each end of the limbo bar or rope. Ask the students to hold the limbo bar at median height (the height at which half the students are taller and half are shorter) of the students.
6. Ask the remaining students to line up and one-by-one go under the rope ‘limbo style’ (bending backwards). Most students should be able to pass under the rope at this height. Tell the students that this represents their local stream or river (tell the name of the river).
7. Ask the students to line up in front of the limbo bar again. This time, before each student attempts to go under the rope the students should each pick up a card and read it to the class. If the message on the card degrades the water quality move the bar down a little before the student attempts to go under (about 7.5 cms or 3 inches). If the message on the card prevents pollution or improves the water quality raise the bar a little before the student attempts to go under.
8. Let each student select a card and go under the bar one or 2 times. If the bar is ever too low for any student to go under the water is too polluted for life in the stream and the game ends. After each student has gone under the bar twice, ask them to go back to their seats.

Evaluate

- As a quiz or “exit ticket” (needs to be handed to the teacher on the way out the door), have each student write down five actions that can help reduce water quality and five that harm water quality.
- Have students either:
 - ⇒ write a newspaper article about how and why to prevent storm drain pollution
 - ⇒ draw a poster to help inform people on how and why to prevent storm drain pollution

Adapted from Reaching Your Limits, Project WET Curriculum and Activity Guide.



Curriculum links

While the Yellow Fish Road™ program complements citizenship learning in any grade, the additional activities we have suggested here relate to the following units:

	Grade 2	Grade 4	Grade 6	Grade 7	Grade 8
Alberta		Waste and our World		Interactions and Ecosystems	Fresh Water Systems
Atlantic	Environment	Habitats		Interactions within Ecosystems	Water Systems on Earth
B.C.	Air, Water, Soil	Water		Ecosystems	
Manitoba	Air and Water in the Environment	Habitats and Communities		Interactions within Ecosystems	Water Systems on Earth
Ontario, NWT	Air and Water in the Environment	Habitats and Communities		Interactions in the Environment/ Interactions and Ecosystems	Water systems/ Freshwater systems
Saskatchewan			Ecosystems	Renewable Resources	

For more information about the Yellow Fish Road™ program:
www.yellowfishroad.org

For more information about Trout Unlimited Canada:
www.tucanada.org

