

**STREAM DAYS**  
**TEACHER RESOURCE GUIDE**  
**AND**  
**ANSWER KEYS**

## WATER AND ME ACTIVITY

### Background Information -

- ◆ Water is about 65% of the human body.
- ◆ Healthy human adults can live without water for only about 1 week. Children, sick people, and elderly sick people will not live as long.
- ◆ Water is recycled through nature so the amount on Earth stays the same.
- ◆ In Missouri, 75% of communities depend on water from surface sources (rivers, lakes) while the remaining 25% depend on groundwater, which soaks in from the surface.

### Warm Up -

- ◆ Ask students how long they could live without water and where their water comes from. After they brainstorm answers, share the information from the background.
- ◆ Explain that they will be learning about water and water quality both in and outside of the classroom. Give general background information about the booklet and Stream Day. Pass out booklets and go over Contents page.
- ◆ Tell students that they will be doing the *Water and Me* activity first.
- ◆ Ask students to make a list of uses for water individually for a few minutes.
- ◆ Have students then work in pairs to combine their lists.

### Activity -

- ◆ Ask the groups to share their lists and compile one master list for the class on the board or overhead. Tell groups not to repeat uses that have already been mentioned.
- ◆ Introduce the water use categories listed below.
- ◆ Tell the students to place each water use from the class master use list into the following categories. Use color codes or symbols next to each use for each category. Check for accuracy and comprehension.

*Domestic Uses* (household, personal hygiene, yard, garage, pets)

*Agricultural* (crop and animal farming)

*Industry* (factories, mines)

*Recreation* (water sports, fishing, swimming, boating)

*Commercial* (businesses; malls, restaurants, stores)

*Wildlife* (plants, animals)

*Power* (electricity production; hydroelectric power, steam in power plants)

*Municipalities* (city water and sewage)

- ◆ Have the students complete the *Water and Me* activity page in the booklet by constructing a web of the categories and uses for water that the class developed.

## UNDERSTANDING STREAMS PRE-READING ACTIVITY

This activity is optional, but strongly recommended for students who are not reading at grade level. Follow the instructions as stated in the booklet.

## UNDERSTANDING STREAMS READING ACTIVITY KEY

**NOTE: Students may write the answers in their own words. The following answers are, for the most part, directly from the booklet.**

### Introduction

1. We must understand how streams work and what we can do to ensure they will continue to function properly.
2. Answers will vary. Check for a supporting explanation.
3. Both the parts of a clock and the part of the land around a stream must work together to function properly.

### The Watershed

1. The watershed is an area of land that drains into a stream. This includes water both surface runoff and groundwater.
2. The receiving stream will be degraded.
3. "...every **stream** is the product of its **watershed** and each of us **lives** in a watershed."
4. How we use the land is ultimately reflected in the condition of the stream.
5. The types of soil, plants and trees, and the natural slope of the land determine the runoff patterns of a stream.
6. Watersheds with timbered lands and native grasses deliver runoff slowly whereas cleared land and paved land allows water to run off faster.
- 7.

#### *Wise Flood Plain Uses*

<i>Urban Areas</i>	<i>Rural Areas</i>
<ul style="list-style-type: none"><li>◆ Parks,</li><li>◆ Ball diamonds</li><li>◆ Football</li><li>◆ Soccer fields</li><li>◆ Industries</li></ul>	<ul style="list-style-type: none"><li>◆ Pastures</li><li>◆ Pecans / Walnuts</li><li>◆ Row cropping (if stream corridor has trees)</li></ul>

8. \* Star the listed land management practices that protect streams: Build Terraces, Strip Cropping, Storm Water Control

X the listed land management practices that harm streams: Row cropping on erodible land; Careless handling of household or industrial chemicals; Erosion from construction sites or strip-mining areas

9. Thinking Question: Answers will vary. Students should choose one harmful land management practice and describe how to change the practice so it is less harmful to streams.

### **The Floodplain**

1. The floodplain is located on both sides of a stream channel and it carries the floodwaters that the stream cannot handle.

2. If a floodplain is not allowed to work properly the channel is forced to handle more of the flow, and the stream will be eroded to a larger size.

### **Stream Checklist**

<i>Wise Watershed Practices</i> Answers vary according to student's own observations.	<i>Wise Floodplain Practices</i> Answers vary according to student's own observations.
<i>Unwise Watershed Practices</i> Answers vary according to student's own observations.	<i>Unwise Floodplain Practices</i> Answers vary according to student's own observations.

### **Stream Corridor**

1. A stream corridor is a strip of land bordering a stream channel. A functioning stream corridor is at least 100 feet wide and forested.

2.

*Wooded Stream Corridor Examples*

Controlling <b><u>Erosion</u></b>	Filtering <b><u>Sediments</u></b>	Producing Wood <b><u>Products</u></b> and Fish and Wildlife <b><u>Habitat</u></b>
<ul style="list-style-type: none"> <li>◆ Streamside trees slow the water before it passes over the flood plain reducing erosion on bottomland fields.</li> <li>◆ The tree canopy and underlying leaf layer protect soil from the direct force of falling rain and so reduces erosion.</li> <li>◆ Roots of tree systems growing near water's edge control bank erosion.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Slowed water in a forested corridor drops sediment, gravel and sand within the corridor, rather than on bottomland field or in backwater areas downstream.</li> <li>◆ Trees trap woody debris that would otherwise end up in fields.</li> <li>◆ Forest floor acts as a sponge to slow runoff.</li> </ul>	<ul style="list-style-type: none"> <li>◆ Many species are provided with food, protection, travel lands and nesting cover.</li> <li>◆ Leaves shade the stream keeping it cool.</li> <li>◆ Fallen leaves become an important part of the food chain.</li> <li>◆ Branches produce nuts and berries.</li> <li>◆ Trees provide den cavities for birds and other wildlife.</li> <li>◆ Fallen trees become fish cover.</li> <li>◆ Rich soil develops which is good for growing valuable hardwood.</li> </ul>

**The Stream Channel**

1. The stream channel generally consists of pools and riffles. Pools are deep slow moving water and riffles are shallow with faster flow.
  
2. Both meanders and channels erode and develop. Meanders are constantly changing and remove soil and gravel while channels develop over a longer period of time and erode less.

3. A stream may adjust to changes in its watershed, floodplain or stream corridor by severely eroding banks, depositing large amounts of gravel or eroding bottomland fields.
4. Straightening stream channels, pushing gravel against eroding banks, and dumping old cars and debris on banks are ineffective methods to control stream erosion.
- 5.

<i>Cause</i>	<i>Effect</i>
Stream Straightening	<b>The channel becomes shorter and steeper so water moves faster causing the banks and bottom to erode.</b>
<b>Pushing gravel against eroded banks.</b>	Sediment clogs fish gills and destroys spawning habitat.
Car Bodies and other junk	<b>Junk cannot stabilize the soil (sometimes people try to use car bodies in a stream to stabilize the bank). Junk is ugly and can cause pollution.</b>

6. Heavy equipment and ATV's should not be used in a stream corridor or channel because they will disturb the natural channel or structures that keep the stream system balanced.

### **Conclusion**

- A. Students answers will vary, but should compare the parts of a clock to the parts of a stream. The answer should include that they all have to work together to function properly.
- B. Student answers will vary, but should demonstrate that the student can compare a stream channel, corridor, floodplain and watershed to another object that has specific parts that all have to function together.

## **BIOMONITORING READING ACTIVITY**

1. Macroinvertebrates are aquatic insects living on the bottom of water habitat.
2. Macroinvertebrates indicate conditions in a stream, such as the overall water quality, the presence of nutrients and toxic contamination from pollution sources, and changes in physical habitat such as water flow, sedimentation and streamside vegetation.

3. Students should draw two overlapping circles and complete the parts according to the table below.

<i>Biomonitoring</i>	<i>Alike</i>	<i>Chemical Tests</i>
<p>◆ Can show what conditions have been like for the past few weeks or months in a stream</p>	<p>◆ Both can tell information about water quality of a stream</p>	<p>◆ Can only show the immediate condition of a stream</p>

### **SAVE OUR STREAMS FILM**

Teachers should introduce this film by explaining that they are going to learn about biomonitoring in the film. The instructions in this section should be covered before the film and students share their film facts as indicated by the written directions or by any other methods deemed appropriate by the teacher.

### **OPTIONAL EXTENSION ACTIVITIES**

These activities are not required to participate in the Stream Day, however visiting the **Bryant Creek Watershed Atlas** is strongly encouraged. <http://www.watersheds.org>

### **ON THE BUS**

The teachers should give instructions for this activity after students have loaded the bus. Students may wait and record their observations once they have arrived at the Stream Day site. Field professionals should connect the *On the Bus* observations into their presentations whenever possible.

### **STREAM FIELD DAY ACTIVITIES**

Each activity follows the same format: Connection Question(s), Concepts, Important Terms, Activity Record Sheets and Reflection Questions.

- The connection questions are designed to create a context for the students so they can connect their previous knowledge and experiences to the upcoming activity. Student answers will vary. The field professional should have the students answer this question first and then connect the student responses to their introduction.
- The bulleted concepts are the main ideas. The field professionals should teach and reinforce these concepts in their activity. The concepts can be traced back to the classroom reading activities *Understanding Streams* and *Biomonitoring*.
- The important terms are there for the field professionals and students to draw on. They are all defined in the glossary of terms at the end of the booklet.

- The field professional will direct the activity on the back of the sheet for each field activity. Answers will vary according to various conditions. Students need to complete this section as directed by the field professional.
- The reflection questions are designed to help the student connect their own experiences and previous knowledge to the new information they have just learned. The field professional should end with the reflection question.

### **BACK ON THE BUS**

The teacher should give instructions for this activity, after the students have loaded back on the bus at the end of the field day. The teacher should have students record their observations when they return to school as soon as possible. The teacher can use the student observations for review and reinforcement.

### **STREAM DAY ASSESSMENT OPPORTUNITIES**

This collection of assessments is designed to meet different learning styles and interests of students. These optional activities can be assigned as class work, homework for individuals or groups. Teachers are strongly encouraged to submit quality work to the Bryant Creek Watershed Atlas. E-mail Wanda Byrd, Program Specialist, at [wbyrd@watersheds.org](mailto:wbyrd@watersheds.org) for more information.

### **STREAM DAY ASSESSMENT OPPORTUNITIES SCORING GUIDE**

This scoring guide is designed to give students specific guidelines for the development, creation and presentation of their project. The students should be taught the scoring guide when the project is assigned. The projects should be graded accordingly.

### **GLOSSARY OF TERMS**

The glossary of terms includes those words listed under important terms in the Stream Day Activities. Classroom teachers and field day professionals can direct students to use this glossary whenever appropriate.