Everyone Lives in a Watershed

Pre Lesson 1/SS

Time: 45 minutes
Age: Grades 3-5
Setting: Indoors

Standards:

Environment and Ecology

Watersheds and Wetlands

4.1.7.B: Understand the role of the watershed.

4.1.10.A: Describe changes that occur from a stream's origin to its final outflow.

Geography:

Basic Geographic Literacy

7.1.3.A: Identify geographic tools and their uses.

7.1.6.A: Describe geographic tools and their uses.

7.1.3.B: Identify and locate places and regions.

7.1.6.B: Describe and locate places and regions.

The Physical Characteristics of Places and Regions

7.2.3.A: Identify the physical characteristics of places and regions.

7.2.6.A: Describe the physical characteristics of places and regions.

Reading, Writing, Speaking and Listening

Learning to Read Independently

1.1.5.F: Identify, understand the meaning of, and use correctly key vocabulary from various subject areas.

1.6.5.A: Listen to others.

1.6.5.D: Contribute to discussions.

Objectives:

- Students will identify by correctly labeling on a diagram the headwaters, tributaries and mouth of a water system.
- Students will demonstrate an understanding of stream order by correctly placing the stream order on a diagram of a watershed.
- Students will use a topographic map to trace the water way nearest their school.

Overview: To better understand the concept of a watershed, students will examine the parts of a watershed. This lesson is a precursor to the use of maps to correctly delimit their local watershed.

Materials:

- Diagram of a watershed
- Diagram of stream orders
- Student worksheet
- Topographic map of school's local watershed
- Pencils
- Images of various order streams

Background:

All of the water on the planet is constantly moving from one location to the next. It is easy to see when you watch rainwater running down the sidewalk. Most rivers start as small streams, called **headwaters**. The beginning of a river may also be called the **source**. The water at the source may be bubbling up from an underground spring or it may come from melting snow or ice. Some of the water soaks into the ground and some may flow over land, but all of it flows downhill as it enters a stream. When it rains the water collects and finds its way into a stream. Small streams flow together to create bigger streams. These streams get larger and turn into rivers. A small stream flowing into a larger river is called a **tributary**. The rivers flow until they eventually reach the sea. The end of the river, where it flows into another body of water, is called the **mouth**.

There is a system of classifying the various sizes of streams and rivers and their associated characteristics. Vast differences in habitat occur between small mountain streams and large flowing rivers. A way to identify these varying characteristics is by classifying a stream into **orders**. For a stream to be classified in an order, it must first have year round flow (perennial). A **first order** stream is the smallest stream with year round flow. A **second order** stream is formed when two first order streams come together. When a second order stream joins another second order stream, it becomes a **third order** stream. What happens when a second order stream joins a first order stream? It remains a second order stream. Two third order streams create a fourth order, and so on. The shape of a stream is often dependent on the stream order. A first or second order stream often has a relatively straight channel due to its faster flowing water. The valley that contains the stream is often steep and "V" shaped. As the water velocity slows, the stream begins to meander. Often "braided" channels result from these meanderings. You may notice a flood plain where water flows over the banks. As the water reaches the lower reaches of the river, big winding loops will meander through a flat flood plain and broad river valley.

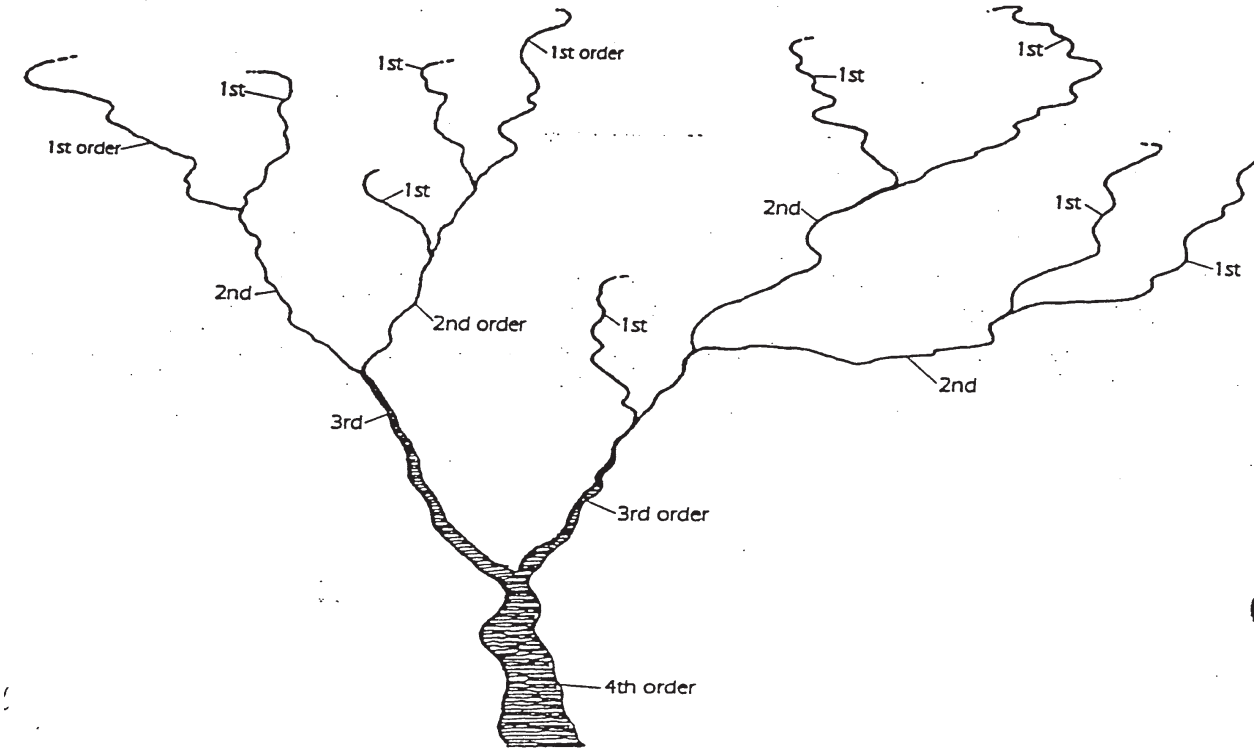
Procedure:

1. Ask students to name the nearest body of water to the school. Explain that this body of water is part of what is called a watershed. Have students define what a watershed is.
2. Explain that all the water on the planet is constantly moving, and to properly study watersheds, we need to develop a common vocabulary. On a diagram or on the board, ask students to define the various parts of a watershed. This could lead to some interesting discussion and introduction of terms. As the discussion ensues, explain the proper terminology and have students properly identify the mouth, tributary, and source or headwater.
3. Introduce the concept of stream order to students by asking students if they know where their local stream begins. Using a topographic map or river map of Pennsylvania, trace the local stream to its headwaters. Explain to students that the headwaters of any waterway is called a first order stream. First order streams begin with the smallest stream that flows year round. When a first order stream meets another first order stream, they form a second order stream. (See notes.) Continue to explain this progression.
4. Explain the different characteristics of a stream based upon stream order. Use images to demonstrate this.
5. Provide students with the student worksheet and ask them to properly label the parts of a stream and stream order. Discuss their worksheets.

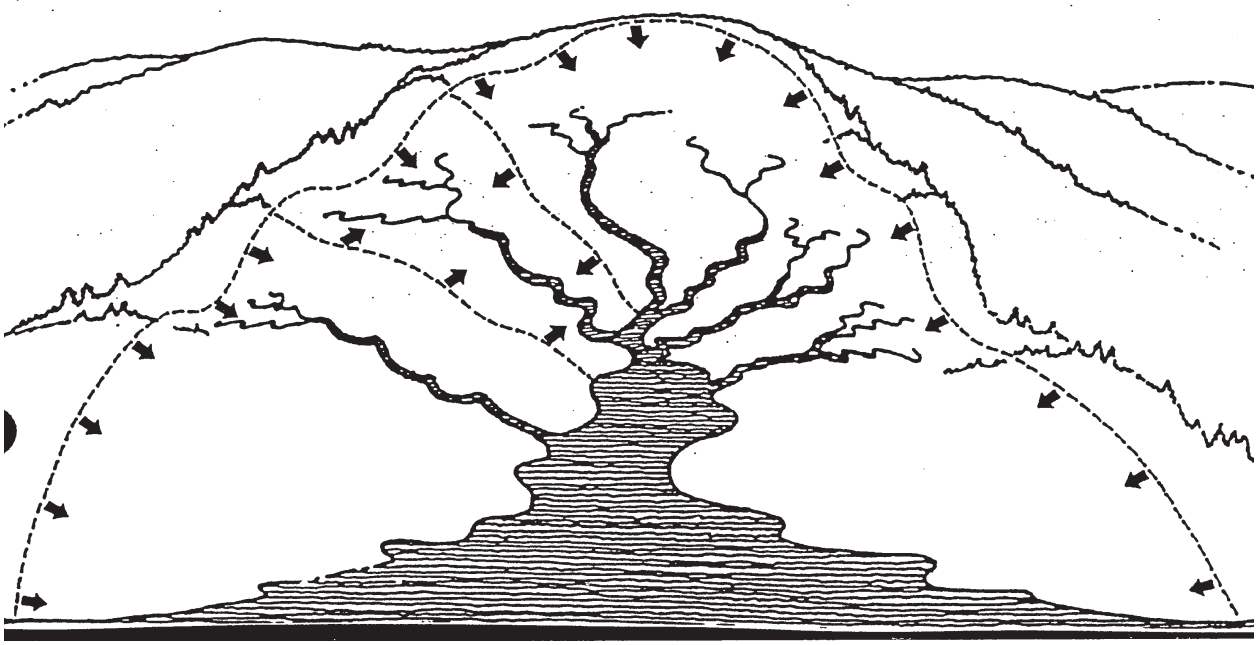
Evaluation:

1. Discussion of worksheets—how accurate were students in their labeling?
2. Have students draw a picture of a watershed that includes streams through fourth order.

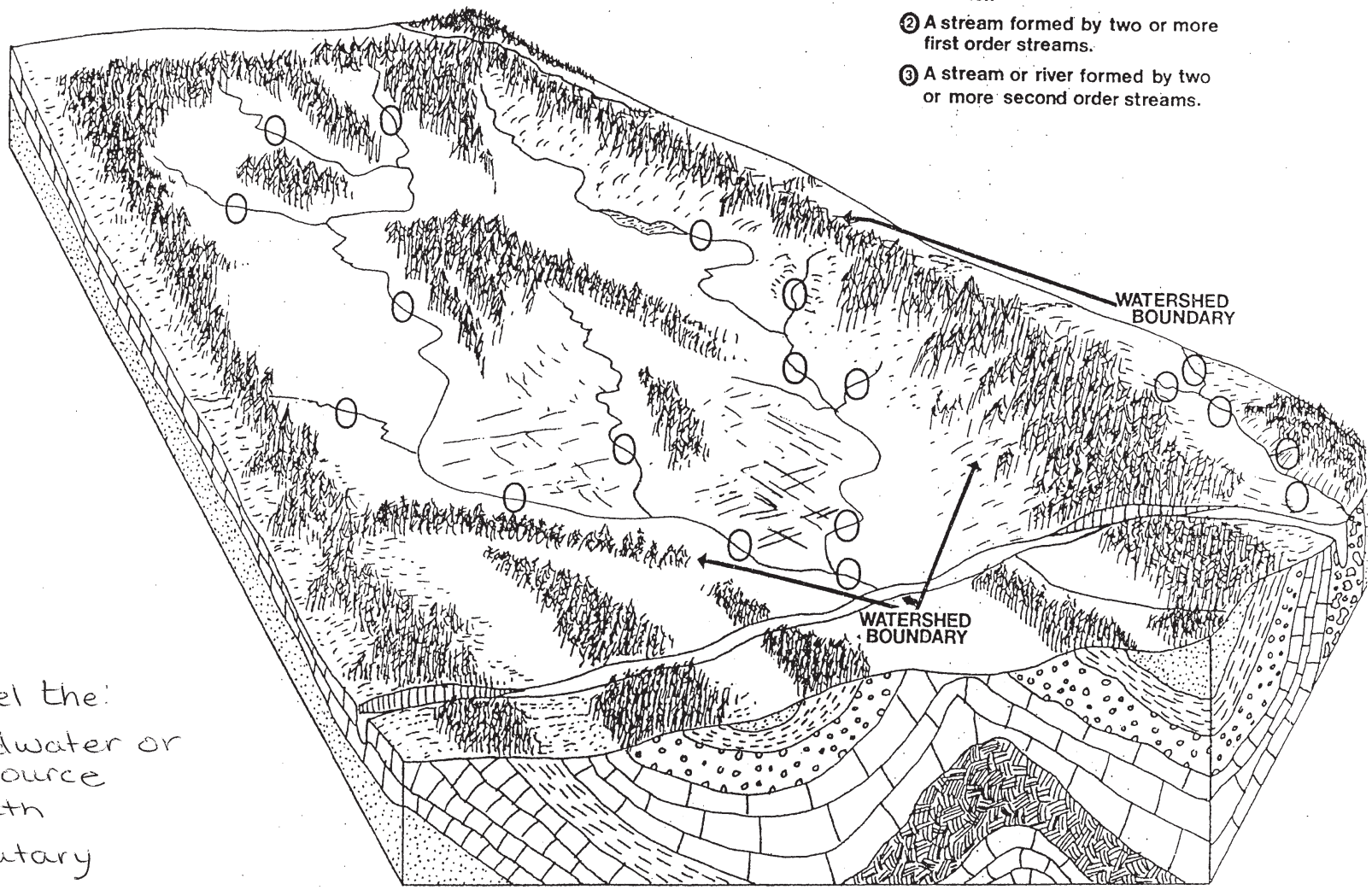
Stream Orders



Watershed



A TYPICAL WATERSHED



STREAM ORDER

1. A stream before it combines with another.
2. A stream formed by two or more first order streams.
3. A stream or river formed by two or more second order streams.

Label the:

headwater or source

mouth

tributary