


**Activity**

## Go with the Flow

<b>Objective</b>	Students will compute the velocity of a creek or stream, and explore the relationship of velocity to different habitats, as well as the kinds of species that live in those habitats.
<b>Setting</b>	Outdoors, at a small creek or stream
<b>Duration</b>	1/2 day to a full day if combined with other field activities, such as "Stream Study," which is also found in Unit II, Section B
<b>Subject</b>	Mathematics, Physics, Science
<b>Skills</b>	Analysis, Application, Comparing Similarities and Differences, Computation, Generalization, Observation, Psychomotor Development
<b>Grade Level</b>	6-12
<b>Vocabulary</b>	velocity    volume
<b>Background Information</b>	Refer to Unit II, Section B-9.
<b>Materials</b>	<ul style="list-style-type: none"> <li>■ String (measured and cut to 100 feet and marked in 1-foot intervals for the first 15 feet of string).</li> <li>■ A yardstick.</li> <li>■ Ping pong ball (painted a bright color), <i>orange or other weighted float</i></li> <li>■ Stop watch.</li> <li>■ Pencils and notebooks.</li> <li>■ Copies of Water Flow Chart.</li> </ul>
<b>Procedure</b>	<ol style="list-style-type: none"> <li>1. Using the string, have the students mark off a 100-foot section of the stream or creek. (You might position a student at each end of the measured section, or otherwise mark it, so you can discern where the section begins and ends.)</li> <li>2. Now use the string to make several measurements of the width of the creek within the 100-foot measured section. Record these numbers in a notebook.</li> </ol>

**Procedure***(continued)*

3. Have the students measure the depth of the creek using the yardstick. Again, ask the students to take several measurements of the depth of water along the measured section and to record these numbers in a notebook.
4. Average the measurements to get a single number for water depth and creek width.
5. Multiply width  $\times$  depth  $\times$  length (100 feet) to get the volume of water in that section of the creek.
6. Have a student start the ping pong ball at the top of the measured section. Another student at the bottom should act as the timer. Allow the ball to float through the "course" several times. Record how long it takes for the ping pong ball to reach the bottom each time, and then average the results.
7. View the creek as a unit of volume per unit of time. How much water flows by in 1 second, 1 minute, 1 hour? Record the answers on the Water Flow Chart. Determine if the creek is a relatively fast- or slow-moving one.
8. Have students note what types of animals and plants live in the stream. What do they look like? What are their shapes? (See Unit I, Section C for more information about plant and animal species.) Help the students to understand the relationship between the types of plants and animals present and the velocity of the stream.

**Extension/  
Evaluation**

You can observe how different shapes affect the speed of an organism in water by conducting a simple experiment. Using an aquarium or a long pan filled with water, measure off a 1-foot section with a wax crayon. Put a mechanical or battery-powered toy in the water and record how long it takes for the toy to travel the length of the marked-off section. Then, change the shape of the toy by gluing fin-like shapes that you have cut from a plastic bottle at different positions and angles along the toy. Repeat the experiment and discuss how the alterations affected the speed and direction of the toy.

## Water Flow Chart

Time	Volume of Water
1 Second	
1 Minute	
1 Hour	

