



### Measuring Runoff—Rain, Rain, Goes Away!\*

We want to find out how much rain (in tons!) falls in a given area. If you select an area that is covered with an impervious layer (paved area), you can consider the rainfall as runoff. If you select a grassy area, you will have to consider many other factors besides runoff. It's a LOT easier to work with a paved parking lot! Plus, it gives you the opportunity to introduce students to nonpoint source pollution in a very real sense. Here's how to do it... Multiply the length by the width to get the area. To get the volume, multiply the area by the feet of rain. To get the weight, multiply the volume by 62.5 pounds and then convert to tons (if necessary). Easy?

For example, an area that is 50 feet by 100 feet equals 5000 square feet. Multiplying that 5000 square feet by 4.2 feet of rain (hypothetical yearly total) gives you a volume of 21,000 cubic feet. Then, multiply the 21,000 cubic feet by 62.5 pounds (the weight of one cubic foot of water) to get a weight of 1,312,500 pounds. Finally, divide that weight by 2000 pounds to get 656.25 tons of water. On that tiny 50 x 100 plot, over 656 tons of rain falls in a year! That's 100+ elephants!

Three or four different measurements are useful: last measurable daily rainfall, monthly rainfall, year to date rainfall and average annual rainfall. You can get these measurements from local television stations, newspapers and <http://www.weather.com> or <http://www.weather.gov>. For example, a one-day rainfall of .5 inches equals .04 feet; the Chattanooga yearly average of 53.5 inches equals 4.46 feet. If you require your students to "translate" to the metric system, you can use the WWW for sites like <http://www.sciencemadesimple.com/conversions.html>.

\*Adapted from Tennessee Aquarium, 2001. Schoolyard Ecosystems and Middle School Science. Eighth Grade Unit 1, Section 1.2 Ecosystems, pp. 29-32. Chattanooga, TN. Funded by Toyota USA Foundation and written by the Center for Math, Science & Environmental Education, Western Kentucky University, Bowling Green. For information and/or a **free copy**, contact George Bartnik at [gpb@tnaqua.org](mailto:gpb@tnaqua.org) or (800) 262-0695, ext. 4049.

---

### **Student Work Sheet for Measuring Runoff – Rain, Rain Goes Away!**

Measure the lengths of your study site: \_\_\_\_\_ **feet**

Measure the widths of your study site: \_\_\_\_\_ **feet**

Determine the area of your study site (length x width): \_\_\_\_\_ **square feet**

Determine the volume of rain (square feet x feet of rain): \_\_\_\_\_ **cubic feet**

Determine the weight of the rain (cubic feet x 62.5 pounds): \_\_\_\_\_ **pounds**

Convert to tons (divide \_\_\_\_\_ pounds by 2000 pounds): \_\_\_\_\_ **tons**