

## Activity Sheet 1: Ratio Basics

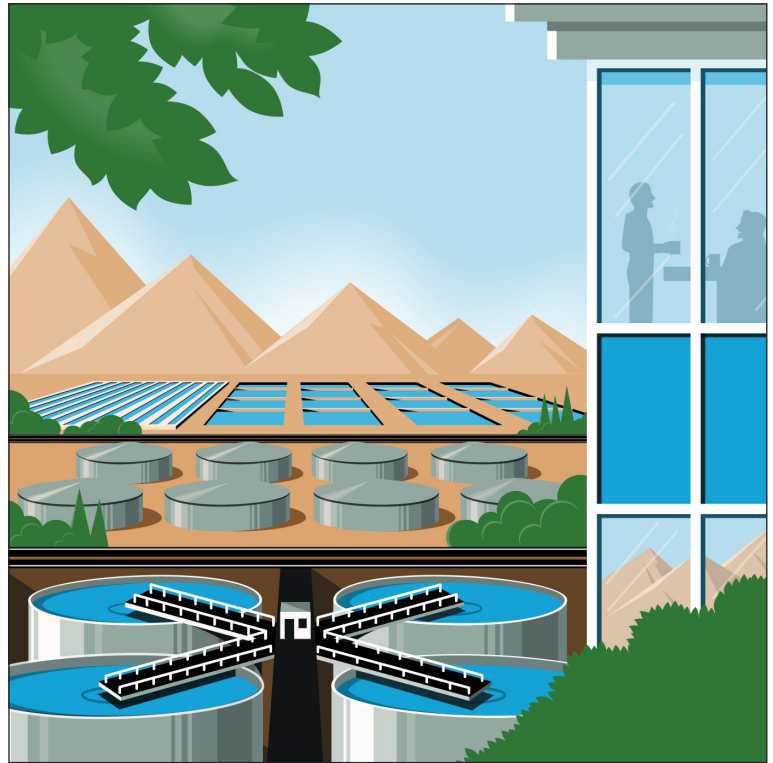
Name: \_\_\_\_\_

Date: \_\_\_\_\_

# A Fresh, Clean Design

You are an architect for the firm of RATIO<sup>n</sup>al Innovations, Inc., a company that specializes in using mathematical principles to design environmentally friendly facilities. Your latest client is an organization that builds water treatment facilities in places where clean and safe water is scarce. You are determined to be meticulous in your design calculations so that construction of a suitable water treatment facility can begin right away.

You want to create a visually appealing design, but you also want it to provide the maximum benefit for the community at a reasonable cost. Here are some of the decisions you need to make:



## WORK THE MATH

*Use a separate sheet of paper for your responses.*

- 1** To make the facility attractive to the community, you are planning to acquire open land to surround the 125,000 square feet of built space, which will include a sprawling water treatment plant, an office, and paved surfaces. If you have determined that a 5:2 ratio of open land to built space is ideal, how much land should be purchased for open space?
- 2** The scale on your architectural drawing of a water storage tank is 1":6'. If the tank is  $3\frac{1}{4}$  inches tall in your blueprint, how many feet high will it be in real life?
- 3** To provide a pleasant work space, your design for the indoor part of the facility includes three windows for every two employees. If your design includes 117 windows, how many employees are expected to work at the facility?
- 4** Regulations where the facility is being built require that the ratio of safety equipment expenditures to overall equipment expenditures be 1:25. If equipment for the plant (including the safety equipment) is expected to cost \$6,250,000, how much must you spend on safety equipment for the facility?
- 5** The money spent on equipment other than safety equipment will be made up of \$2,400,000 for storage tanks, \$2,400,000 for pipes, and \$1,200,000 for filtering machines. What is the ratio of storage tank costs to pipe costs to filtering machine costs (in simplest terms)?

### NOW TRY THIS!