



## INVESTIGATING WATER AS A RESOURCE



### Inquiry

#### Modeling

To investigate the flow of groundwater in the environment, you have set up a model. Models are very useful scientific tools. Scientists use models to simulate real-world events and processes. They do this when it is difficult to study the real thing in a controlled way. It is important that you try to model what happens in the real world as accurately as possible.

#### Using Mathematics

Mathematics is a key tool for scientists. Accurate measurement with suitable units is very important for collecting and analyzing data. In this investigation you must measure time. You also are measuring length. You need to decide on the best unit of length measurement to use.



Dispose of the straws or mark them as contaminated.



5. While spraying, note the time, and put four drops of food coloring in the middle of the paper towel. Continue spraying.  
Watch for colored water to emerge from the lower end of the wedge of gravel.
  - a) Record the time when you first see the colored water, and record the later time when the water again becomes clear of coloring.
6. Stop spraying and note the time.
  - a) Record this time and then record the later time when the flow of water out the open end of the container has slowed down to a trickle.
7. Remove the gravel and clean up the setup.  
Spread the gravel out on a plastic sheet to allow excess water to drain away.
8. Repeat Steps 2 through 7 with the coarse sand and then with the fine sand in the container.
  - a) Record all your observations and data.
9. Repeat Steps 2 through 7 with the mixed material in the container.
  - a) Record all your observations and data.
10. Use your results from all parts of the investigation (gravel, coarse sand, fine sand, mixed materials) to answer the following questions:
  - a) Describe the pattern of water heights in the tubes you observed. How did it compare to your predictions? How can you account for the pattern you observed?
  - b) In which part of the investigation (gravel, coarse sand, fine sand, or mixed material) were the water levels in the straws or tubes the highest? In which part were the water levels the lowest? Why?
  - c) In which part of the investigation did it take longest for the water flow to stop after you stopped spraying? Why?
  - d) In which part of the investigation did the colored water reach the open end of the container the soonest? In which part did the colored water reach the open end of the container the slowest? Why?