

# TerrAqua Column Lab

*The land-water connection*

## Introduction:

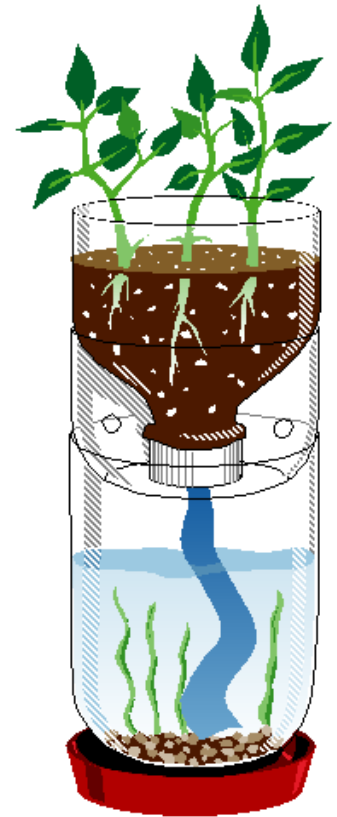
TerrAqua Column (TAC) is a perfect vehicle to make science dynamic, relevant, and fun. The TAC provides a compact, inexpensive, eco-friendly model to explore the link between land and water and allows you to focus on specific aspects of a complex world. Constructed from two 2-liter soda bottles, the TAC has three basic biotic components: soil, water, and plants (animals - such as snails, insects, or tadpoles - may be added to the system, also). By varying just one of the components you can explore how one variable affects the whole system.

## Materials:

Four 2-Liter bottles  
Two bottle caps  
Wicking material (fabric)  
Knife  
Hole punch

Scissors  
Soil  
Seeds  
Pebbles  
Snail

Aquatic Plants  
Water



## Procedure:

Construct a column using the instruction sheet at lab station. Then, you and your lab partner will observe (over a period of 2 full weeks) the effects of various tests or experiments. The more clearly you learn to define your questions and plan your studies, the more successful the experiments will be. Variables to consider include the type and amounts of soil, water, and plants. Remember, depending on their source, the soil and water likely contain algae, fungi, mites, worms, etc. Substances that might affect terrestrial and aquatic systems include nutrients (fertilizers) or pollutants (salts, pesticides, acids).

For this experiment you will set one column and track changes in the column over a two week period. The TAC is a simple model, but all of its parts are dynamic. Keep your investigations very simple by changing only one variable of the system at a time. Keep the following questions in mind:

- What question are you exploring?
- What specific idea (hypothesis) are you testing?
- What variable will you change in your experiment?
- What items will you need?
- What is your experimental procedure?
- Do the results of your experiment support the hypothesis?

## Data Recording and Analysis:

Keep a log of everything you do to your columns. Keep a daily log of measurements and changes taking place in your column. Make a **graph** of your column conveying the plant growth, conditions of water, and relationships between terrestrial and aquatic components of your column. Include before and after **photos or sketches** of your column. Include this information and the questions below in your **lab report** and explain how and why you came to the conclusions you have. Date all entries.

## Questions:

1. What is an indicator species?
2. What type of soil is used in your column? (Potting soil, soil from outside, etc.)
3. What type of water was used in your column? (Fresh, tap, purified, etc.)
4. What type of tests did you design for your column? Explain in detail.
5. How did the tests/experiments affect the growth of any plants (and snails if available) in your column?
6. How would adding fertilizer to the soil affect algal growth in the water chamber of your column?
7. How does temperature affect your column? Explain in detail.
8. What conditions affected your column when you maintained it at home? Explain in detail.

## Going Further- Application to Real Life:

9. Does runoff from fertilized lawns or agriculture threaten the quality of our streams or groundwater?
10. Are landfills affecting local groundwater?