

# Bottle Hydrology

## Skill: Science

## Objectives

Students will:

- Plant a terrarium (closed container garden)
- Observe: infiltration, transpiration, and condensation. This activity reinforces the fact water is present in nature in various forms

## Background

The meaning of terrarium is: little world. A terrarium is a transparent container in which plants are grown in soil. It is tightly fitted with a cover or lid. Glass aquariums, fish globes, and candy or fruit jars can be used. In fact, any clear container with a tight-fitting top can be used. If such containers as fish globes are used, the cover should be clear, such as plastic kitchen wrap. The tight cover will prevent the loss of interior humidity. The terrarium is actually a miniature greenhouse.

Terrariums serve as reminders of the constant motion of water in nature. As the terrarium plants give off water vapor through transpiration, the glass lid and sides of the container trap the vapor, so the plants use the water over again. There may be some moisture on the glass when the terrarium gets warm. That means the plants are transpiring more, and the water droplets on the glass are an example of condensation. A terrarium does not need very much water. You may not need to water your terrarium for several months if the soil is moist from the start.

## Procedure

- Read and Discuss background and vocabulary
- Cover base of plant container with 2.5 cm (1") of gravel for drainage.
- Cover gravel with a 5.0 cm (2") layer of potting soil.
- Make small holes in the soil. Place the plants in the holes so that the roots can be covered. Pack soil around the plants and press firmly. Be careful not to crowd the plants.
- Water the soil lightly and cover the terrarium with a lid or with plastic wrap. (If you are using a soda bottle, use the inverted clear plastic bottle as your lid.) Your terrarium will need only one or two teaspoons of water a month.
- Place the terrarium in a well-lighted spot and enjoy it!
- Make systematic observations about transpiration and condensation.

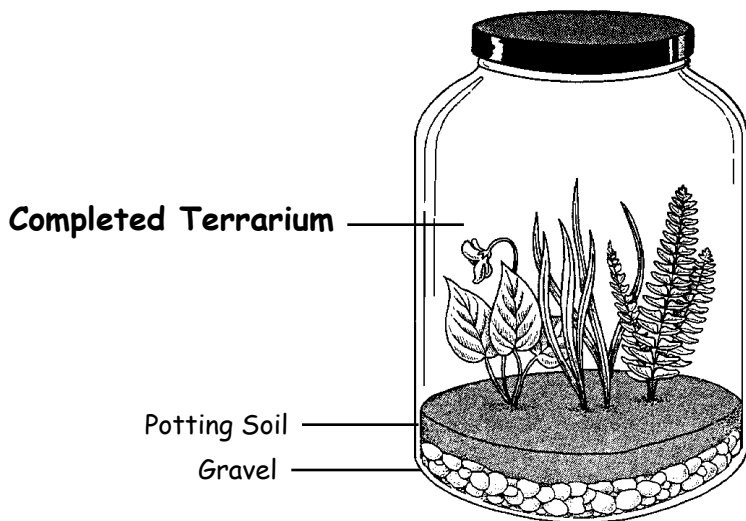
## Vocabulary

- terrarium
- transplant
- condensation
- transpiration
- infiltration
- aquarium
- humidity
- moisture

## Materials

- Covered, clear-glass container with opening large enough to reach into the container
- Gravel (aquarium gravel works well)
- Humus soil or potting soil mix
- Long spoons for moving soil
- Rocks, sticks, plastic ornaments (optional)
- Plants: either collected or bought. Common terrarium plants include native plants like hawkweed, mosses, seedling evergreens, shelf fungus, violets, wild strawberry, wintergreen; and greenhouse plants like baby's tears, dwarf English ivy, dwarf prayer plant, ferns, Japanese aucuba, philodendron, begonias, creeping fig, Swedish Ivy. (Be sure to check laws regarding the collection of wild plants. Some rare plants are protected by law and





- Environmental Conditions:
  - • Warm temperatures (75°F to 80°F maximum)
  - • Partial shade (east or west window, well-lit room, no direct sun)
  - • Maintain evenly moist soil

*Adapted by permission from Terrariums, Oklahoma State University Cooperative Extension Service, Stillwater, OK and Teaching Aquifer Protection, Cooperative Extension Service, Clemson University, Clemson, SC.*

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## P.A.S.S.

### 4th Grade

#### Science

- Process: 1.1, 3.1, 4.4, 5.2
- Life: 3.1

#### Math

- Process: 1.2, 4.4
- Content: 4.4b
- Read: 1.1, 3.1b
- Write: 1.2

### 5th Grade

#### Science

- Process: 1.1, 3.1, 3, 4.4, 5.2
- Life: 2.2

#### Math

- Process: 1.2, 4.4
- Read: 1.1a, 3.1b
- Write: 1.2

### 6th Grade

#### Science

- Process: 1.1,2, 3.1, 4.5
- Life: 4.1,2

#### Math

- Process: 1.3, 4.1
- Read: 1.1, 3.1b
- Write: 2.7

