How to Make a Germination Bottle

Introduction

Germination bottles are a great way to maintain a moist environment for young seedlings. Use common supplies to construct a germination bottle of your own!

Concepts

- Germination
- Seed viability

Materials

Box cutter, optional
Paper towel, two-ply
Parafilm M®, 4″ × 4″ piece
Plastic bottle, 1-L
Scissors
Seeds
Water, tap

Safety Precautions

Use caution while using a box cutter or scissors.

Procedure

1. Lay the 1-L bottle on its side. Using a box cutter or scissors, very carefully cut off the top of the bottle approximately 2 inches from the base of the neck (see Figure 1).
2. Fill the bottom portion of the bottle half way with tap water. Set bottle pieces aside.
3. Obtain scissors and paper towel. Cut one 12″ × 2″ strand, one 6″ × 6″ square, and one 3″ × 3″ square of paper towel. Set aside.
4. In the center of the 3″ × 3″ square, cut two 1-inch slits approximately half an inch apart (see Figure 2).
5. Thread the strand from Step 3 through these slits until the ends are even on both sides, as shown in Figure 3.
6. With the top section of the bottle inverted, thread the strands through the neck of the bottle. Set the inverted bottle section into the bottom of the bottle so that the neck and strands point down and rest in the water (see Figure 4).
7. Fold the 6″ × 6″ paper towel from Step 3 into a 3″ × 3″ square. Place this square into the bottle and press gently. It should overlap the other piece of paper towel and fit snuggly.
8. Dampen the paper towel using approximately 15-mL of water.
9. Evenly spread seeds on the paper towel.
10. Cover the opening of the bottle with Parafilm®. Place the germination bottle in a desired growth location.

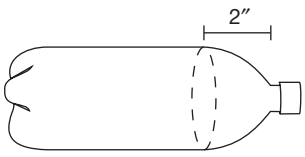

Figure 1.

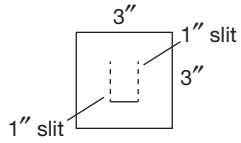

Figure 2.

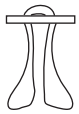

Figure 3.

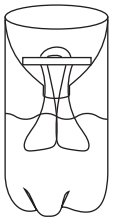

Figure 4.

Disposal

The germination bottle may be saved for future use.

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NGSS Alignment

This laboratory activity relates to the following Next Generation Science Standards (2013):

Disciplinary Core Ideas: Middle School

MS-LS1 From Molecules to Organisms: Structures and Processes

LS1.A: Structure and Function

LS1.B: Growth and Development of Organisms

Science and Engineering Practices

Developing and using models

Planning and carrying out investigations

Crosscutting Concepts

Cause and effect

Energy and matter

Structure and function

Tips

- Soil can be used in place of a paper towel for seed growth. Thread the paper towel strand, folded in half, through the bottle neck. Place soil into the inverted bottle around the strands, allowing them to remain in a vertical position to best deposit water. Once seeds have germinated successfully, the soil can be transplanted to a permanent growing location such as a garden or a pot.
- The number of seeds a germination bottle can accomodate will vary depending on seed size. Allow enough space to limit crowding. Seeds should be evenly spread out.
- Seed germination can be observed within approximately seven days if seeds are placed in the appropriate temperature and light environment. Under optimal conditions, growth may occur in as little as three days.
- Germination bottles can be used to maintain seed growth over long weekends or breaks.
- Experiment with albino tobacco seeds using germination bottles. Place one bottle containing the seeds in a dark environment and another bottle containing seeds in a well-lit environment. How do the different environments affect the growth and appearance of the tobacco seeds?

Materials for *How to Make a Germination Bottle* are available from Flinn Scientific, Inc.

Catalog No.	Description
FB1165	Albino Tobacco Seeds
AP1501	Parafilm M® 4″ × 125′ Roll

Consult your *Flinn Scientific Catalog/Reference Manual* for current prices.