

RAFT IDEAS

Topics: Botany, Plant Growth, Scientific Method

Materials List

- ✓ CD jewel case with inner piece removed
- ✓ Plastic tray
- ✓ Rubber bands, if jewel case tips over
- ✓ Paper towel or coffee filter
- ✓ Scissors
- ✓ Ruler (metric)
- ✓ Permanent marker and/or printed grid
- ✓ Radish and/or other fast-growing seeds
- ✓ Water

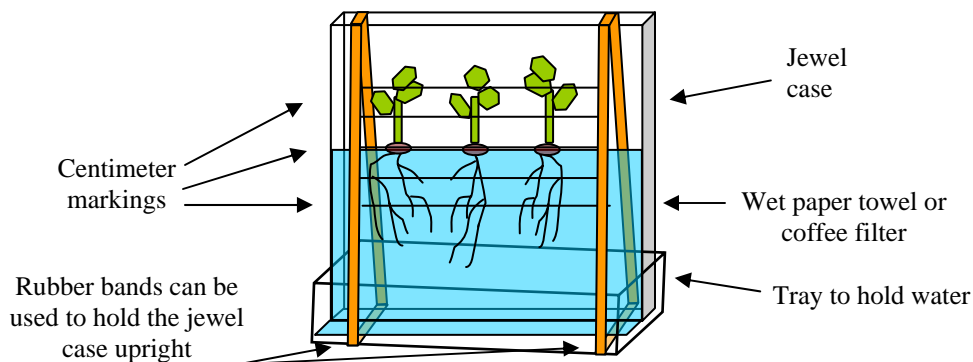
This activity can be used to teach:

(CA Science Standards)

- Plant structures and functions (Grade 3, 3.a; Grade 5, 2.0; Grade 7, 5.0)
- Environments affecting plant development (Grade 2, 2.e; Grade 4, 3.b)
- Scientific experimentation (Grade 5, 6.b – 6.i; and above)

The GERMINATOR

What a Great Vista, Baby!



Create an attractive, reusable, seed germinator that allows students to easily collect data on root and shoot growth. View roots growing, create graphs, do experiments, and enjoy the “magic” of seeing dry seeds change into living plants!

To Do and Notice

1. **Option 1:** Position the CD case with the hinge at the top. Using a ruler and permanent marker, draw a straight line across the CD case at the level where the seeds will be placed (about at the middle). Draw 5-6 measurement lines at 1cm intervals above and below the centerline (seed-line).
Option 2: Insert or attach a preprinted grid. (See the back page for a blackline master plus instructions.) Insert or attach the grid, as needed, at step 3.
2. Cut or fold a paper towel, or coffee filter, to make a section ~ 12 cm x 16-24cm (5”x 6+”). Make a zigzag fold or roll, ~1 cm (½”) wide, on one 12 cm (5”) end of the paper section. This will help wedge smaller seeds between the paper and the shut CD lid. Small seeds may also be glued to the paper. Place the paper section **on the side with the gap** of the opened CD case, with the folded end at the future seed-line. The extra paper will hang over the end of the CD case.
3. Wet the paper towel or coffee filter. The wet surface will help hold the seeds in place. Place 4-6 seeds on the wet paper in a line that will match up with the line drawn on the CD case. If a preprinted transparency grid was created then lay the grid over the seeds with 1 of the horizontal lines lining up with the row of seeds.
4. Adjust the paper towel as needed so the seeds and a line match. Close CD case.
5. Stand the CD case on end inside the plastic tray and secure in place by wedging the CD case in at an angle or use rubber bands as shown in the illustration above.
6. Put water in the tray. Refill the tray with water, as needed, to keep the paper wet.
7. Create a sheet to record plant growth and date. Measure root and shoot growth in centimeters each day. Include pictures, graph of data, and written observations.

The Science Behind the Activity

Plants produce seeds that are inactive, or dormant, allowing the seeds to survive poor growing conditions. When the moisture, temperature, light, etc. levels are sufficient to trigger growth the seeds can germinate, if not too old. Germination is the dynamic process by which a seed becomes a young plant. Students can observe this process by using The Germinator with seeds that germinate quickly. During germination the plant embryo in a seed uses nutrients contained within the seed to grow and produce a plant seedling. The seed contains enough nutrients to sustain plant growth until the plant can begin to produce nutrients via photosynthesis.

Taking it Further

Students can measure the effects on growth of changes in environmental conditions.

Possible variables include using salt water, adding fertilizer to the water, using different kinds of light (fluorescent, colored, none), different temperatures, different types of seeds, etc.

Students could transplant the seedlings into soil and make additional observations on plant growth, flowering, etc.

Using a preprinted grid:

- ✓ The centimeter grids printed on this page can be copied on transparencies (best) or paper.
- ✓ Copiers may slightly increase the size of the original image. You should check that the copied grid lines are still at 1-centimeter intervals. Use the reducing (zoom) feature of the copier if needed.
- ✓ Cutting between the bold double borderlines yields a transparency section that will fit snugly inside the CD case. The grid will be placed in the CD case over the seeds that have been put on the wet paper section.
- ✓ Secure a printed-paper grid to the back of the CD case, away from the water. The paper grid would not be as useful for measuring root growth.
- ✓ Continue with step 2 of the **To Do and Notice** section on the other side of this page.

