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Topic: Plant Growth Germination Lab

Summary: The goal of this basic lab is break the misconception that photosynthesis is how plants grow. Students should also learn that plants grow by cell division.

Goals & Objectives: Students will be able to move past the misconception that plants use photosynthesis, not cell division, to grow.

NGSS Standards:

HS-LS1-4: Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms

HS-LS1-5: Use a model to illustrate how photosynthesis transforms light energy into stored chemical energy.

Common Core: RST 9.10.3, 9.10.5, 9.10.7

Common Core: WST 9.10.1b, 9.10.1e, 9.10.2a, 9.10.7, 9.10.9

Time Length: 3 days

Day 1: CD case set-up (20-25 minutes)

Day 3: Record data and clean up (15 minutes) and finishing the lab report (30-45 minutes).

Prerequisite Knowledge: Students should have already been introduced to the following concepts: cell division and metabolism. If they have not been introduced to cell division, then the challenge question can become extra credit.

Materials:

- clear CD case
- paper towel
- seed (Mung bean)
- container of water to place CD case
- light source
- dark cabinet

Accommodations: Students with an IEP should work in a group with strong writing skills. You may want to provide sentence frames for students to write the CER. Notes about cell division can be provided so they have easy access to relevant science concepts.

Editable DOCX File and Answer Key:

Available at www.ngsslifescience.com

Name: _____ Row: _____

Plant Growth Germination Lab

Date: _____ Period: _____

Driving Question:

Can seeds germinate without photosynthesis (light)?

Materials:

- 2 clear CD case
- 2 paper towel
- 8 seed (Mung bean)
- container of water to place CD case
- light source
- dark cabinet

Background:

The purpose of this lab is for you experience how a seed germinates, what is required, and observe what is happening at the root, stem and leaf tissue level. To test this, we are going to put 4 seeds in water and put into a cabinet.

Hypothesis:

Procedures:

1. Obtain materials (2 cd case, 2 paper towel, 8 seeds)
2. Open CD case and fold the paper towel in half. Folding the paper towel helps to keep the seeds from moving around in the case.
3. Place the paper towel into the open CD case.
4. Place the four seeds near the hinge of the CD case.
5. Close the CD case and make sure the seeds have not rolled down toward the bottom opening of the case. This bottom part will be submerged in water.
6. Label the CD case tape with your group's name(s) and period.
7. Place the CD case in the Dark water container with the hinge facing up. This way water can use capillary action to move up the paper towel to get to your seeds. The teacher will move this container into the closet.
8. Repeat steps 2 to 6. The second CD case will be placed in the Light water container. The teacher will move this container into the light.
9. After two days, inspect your CD case and count the number of germinated seeds.

Variables:

Independent: _____ Dependent: _____

Constants: _____

Control Group: _____

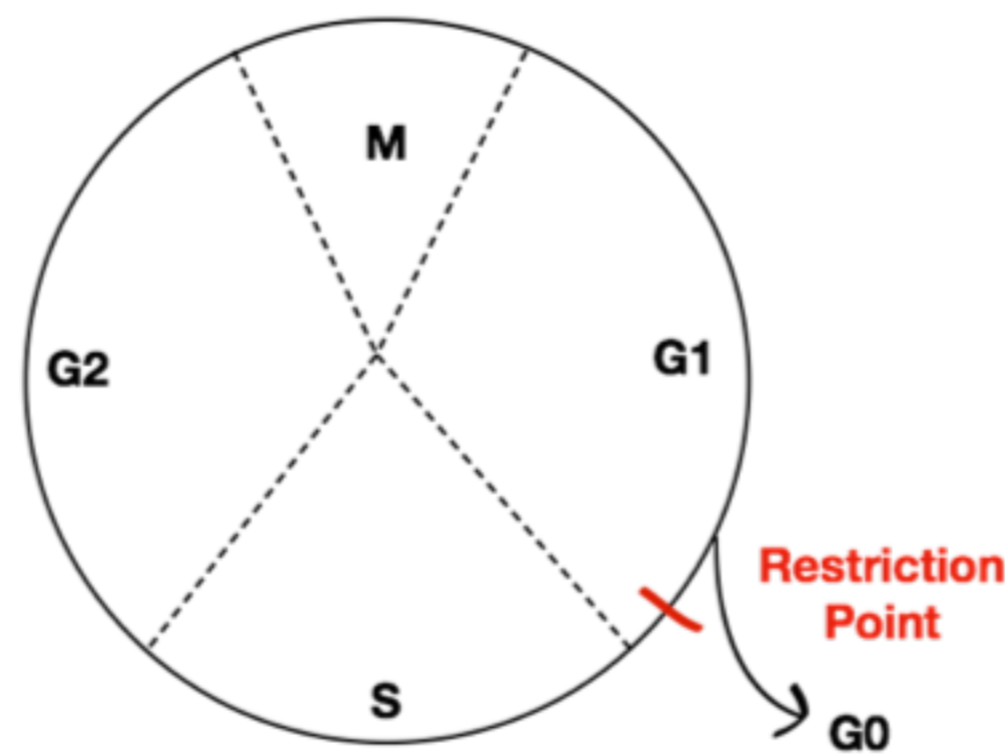
Data Table: Include both experimental and control group data.

Experimental Errors:

Conclusion:

Do you confirm or reject your hypothesis? _____
What *evidence* supports why you confirmed or rejected your hypothesis?

Driving Question: Can seeds germinate without photosynthesis (light)?



Challenge Question:

Write a three-sentence claim evidence reasoning paragraph. The claim answers the driving question, your evidence is from the data table and use the diagram above to help with the reasoning.
