



Topic: Plant Growth Lab

Summary: Students will learn how photosynthesis is used by a plant to make sugars. These sugars are then used to perform cellular respiration to make energy. The sugars are converted into larger molecules like cellulose to help build the structure of plant cells. Students should also recognize that plants grow by cell division.

Goals & Objectives: Students will be able to how many processes are involved for plants to grow. Students will be able to design a guided inquiry experiment.

Standards: NGSS: HS-LS1-4, LS1-5, LS1-6, LS1-7
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: 5 partial periods for writing procedures, watering and observations, graphing, and writing the conclusion

Prerequisite Knowledge: Students should have already been introduced to the following concepts: cell division, photosynthesis, sugars, cellular respiration, and metabolism.

Materials:

- Grow light
- Graduated cylinder for measuring amount of water / solution
- Germinated seeds, preferably seeds that grow fast like the Mung Bean
- Pot / beaker or other container to hold soil
- Cola or energy drink solution
- Coffee solution
- Fake urea solution (ammonia)
- Sugar solution
- Weak acid solution (vinegar)
- Saline solution

Accommodations: Students with an IEP should work in a group with strong experimental design skills. Notes about the main concepts can be provided so they have easy access to science concepts.

Data Table: Include both experimental and group group data

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Graphing: Create a line graph to display your data. Include both experimental & control groups
Experimental Errors:

Conclusion:

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

Challenge Questions:

1. What process did the plant use to grow taller? _____
2. Why did the plant need to perform photosynthesis in order to grow? _____

3. What organelle did the plant use to perform photosynthesis? _____

4. Explain how the plant got the energy needed to grow? _____

5. What organelle did the plant use to perform cellular respiration? _____

6. What else were the sugars used for besides cellular respiration? _____

7. Explain how the plant used all the processes discussed to grow. _____
