**Unit 2 Hands-On Activity: Photosynthesis**

# Seedling growth response to light level, an experiment

## Introduction:

Photosynthetic plants require light to make sugars in order to produce the energy to grow. Yet, when we think about plants needing light to grow, we do not intuitively understand how light affects the rate at which plants grow taller. Plants do exhibit positive phototropism, which means they grow towards light. However, more light does not mean a taller plant. Instead, when there is a young, recently sprouted tree in the forest growing under trees, it will grow taller in the same period of time as the same tree growing in full sun. “What?” you may ask. Well, the plant in the spot with less sun is “reaching up” to try to get to the light; the plant in full sun doesn’t have to do any “reaching”.

Given this introduction, write a hypothesis about which seedlings, “light” or “no light” will grow taller one week after germination. Then go look up “etiolation” in a dictionary.

You don’t have to do the experiment below since data are provided to you already, but you may find it very interesting and beneficial to do the hands-on activity.

## Materials:

1. One package of viable and fast germinating seeds
2. A couple cups of potting soil
3. Two containers to plant the seeds
4. A spray bottle to watch the seeds
5. A tray to put the pots on to catch the water that comes out the bottoms.
6. A warm indoor space to put containers.
7. A metric ruler

## Methods:

1. Take your two containers and add the soil to fill them close to the top of the container. Plant your seeds, about 6-7 per container, and cover with the amount of soil that the package recommends. A good rule of thumb is to cover the seed with the amount of soil that corresponds with the size of the seed, so a seed that is ½ cm should be covered with ½ cm of soil.
2. Gently but thoroughly water your seeds and then put them on the tray and put them in a warm location (no sun is needed at this point). Keep the surface of the soil moistened until the seeds sprout, by daily gentle misting of the soil with water from a spray bottle.
3. Once your seedlings sprout, print out the table in the excel file link to this week’s assignment, or open the file to see what data you will be recording.
4. Remove all but three seedlings from each of your containers; you should have 6 seedlings total, 3 in each container.
5. Label the seedlings as #1, 2 and 3 by labeling each container with arrows. Use tape to add something to write on if your marker is not permanent. Label one container as “light” and the other as “no light”
6. Measure each seedling from the base of the plant (the soil line) to the top of the plant, recording each data point in your table.
7. Place the “light” container in a sunny, warm (but not hot) space. Put the “no light” container in an area with no light (like a cupboard) but that is a similar temperature. OR, take another plastic cup and put it upside down over the first cup, cover the whole thing with foil and put it next to the “light” container.
8. Repeat Step 6 for the next 6 days.

## Data:

Data for this experiment is provided for you in the Blackboard course site. Be sure to download it. Then generate a graph in Excel plotting the average seedling growth, for both types of seedlings, over time. You can find the instruction on how to draw a graph in Excel in the Blackboard course site.

## Submission:

Submit the file, which includes your hypothesis and the graph, to be graded in Blackboard. You may submit a Word file, an Excel file, or a PDF file. The hypothesis is worth 5 points while the graph is worth 25 points.