**\_\_A. Background:**

**Germination** is the early G\_\_\_\_\_ of an E\_\_\_\_\_ plant from a S\_\_\_\_\_.

**To germinate, seeds need a 1) place, 2) warmth, 3) water and 4) oxygen (to use their food).**

**NOTE: Phenomena (plural) are observable facts or events.**

An observable **phenomenon (singular)** about seeds is that when seeds grow, leaves grow upward and roots grow downward (or underground). We see the \_\_\_\_\_ above the ground and when we see the plant part that is underground, we usually see \_\_\_\_\_. We know that leaves need light and roots seem to get food from the leaves.

A **tropism** is a phenomenon, of the growth or turning of a plant, toward an environmental stimulus, such as light, gravity or warmth. A **negative tropism** is moving away from a stimulus. Phototropism is moving \_\_\_\_\_ light; negative phototropism is moving \_\_\_\_\_ light. Gravitropism is moving \_\_\_\_\_ the force of gravity or \_\_\_\_\_ (up or down?)

**\_\_B. Experiment: Demonstrate:**

**\_\_When seeds germinate do the leaves and roots show gravitropism?**

\_\_Think about: does it matter if the seed is planted upside down, sideways or straight up?

\_\_Think about: if you are studying gravitropism, does it matter if the seed gets light or not?

	Factor	Experiment Setup (Circle one for each)
1	Type of Seeds	Constant....Independent Variable...Dependent Variable
2	Amount of Water	Constant....Independent Variable...Dependent Variable
3	Position of Seed	Constant....Independent Variable...Dependent Variable
4	Amount of Light	Constant....Independent Variable...Dependent Variable
5	Direction of growth	Constant....Independent Variable...Dependent Variable

**\_\_C. Set Up: Requirements and Materials:**

- \_\_1. Use a plastic bag. Label the bag with your Name, Period and Start Date.
- \_\_2. Position seeds so you can see them through the plastic.
- \_\_3. Use moist paper towels for a place and to hold water. Leave NO WATER STANDING.
- \_\_4. Create a way to hold the seeds so the embryos are in different positions.
- \_\_5. Consider that the seeds need some air for oxygen.
- \_\_6. Ask where!

**\_\_D. Observations: (See Page 2)**

- \_\_1. Draw and label each seed, each day, starting with Day Zero.
- \_\_2. Draw and label the root and shoot (leaves) of each seed each day.
- \_\_3. Write observations about any changes you do, or see, and can't draw.
- \_\_4. **Have Checked when you have the seeds.**

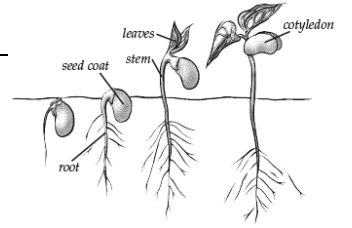
**\_\_E. Conclusion:**


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**D. Observations Continued.**



Day # \_\_\_ Date \_\_\_\_\_

Day # \_\_\_

Day # \_\_\_

Day # \_\_\_

Day # \_\_\_

Day # \_\_\_