**PLANT TROPISMS**

We all know that plants are anchored to the ground, so when they run out of water, sunlight, or nutrients they cannot pick up their roots and go searching for more like animals can. What do they do to survive? Plants have adapted special chemicals called "hormones" that allow them to respond to a signal or change in their environments (called a ***stimulus***). These hormones make the plant grow *toward* a beneficial stimulus and *away* *from* a harmul stimulus. The movement by the plant in response to a stimulus is called a ***tropism***.

The following list includes 6 plant tropisms. Think about what a plant needs to live or what could harm a plant. What types of stimuli do you think a plant would respond to? Can you figure out what stimulus each tropism is responding to? As an example, the first tropism has been done for you.

Gravitropism—Movement in response to gravity .

Chemotropism—Movement in response to .

Phototropism—Movement in respone to .

Thermotropism—Movement in response to .

Thigmotropism—Movement in response to .

Hydrotropism—Movement in response to .

GRAVITROPISM PROCEDURE:

1. With a marker divide a petri dish into 4 quadrants Take four beans that have been soaked overnight. Place one bean in each quadrant (if the petri dish were the “face of a clock” one bean would go at the 12, 3, 6, and 9).
2. Cut two layers of paper towels so that they just fit in the petri dish. Place the paper towels on top of the seeds in the petri dish. Be sure not to move around the seeds.
3. Pour 30 milliliters of tap water on the paper towels. Place enough cotton over the paper towels so that seeds and paper will be held in place when the cover of the petri dish is put on.
4. Place the cover on the petri dish and tape it shut. Tape the petri dish containing seeds to the wall of a cupboard or a drawer with the bottom of the dish (showing the seeds) facing out so that you can monitor the seeds as they sprout. Mark the side of the petri dish that is facing up, so you know how the plate was oriented when you make your final observations. Close the cupboard.
5. Predict how you think the roots will grow from each of the seeds by drawing a picture below.
6. When the beans have sprouted draw a picture of the petri dish with the beans. Make sure that the side of the petri dish that was facing up in the drawer is facing up when you make your drawing. Did the beans grow as you predicted?

Prediction: Observation on the final day:

Why would response to gravity be important for plants?

Why was it important to keep the petri dish inside of a drawer or cupboard?

Next we will examine how plants respond to light. This tropism is called ***phototropism***.

PHOTOTROPISM PROCEDURE:

1. Plant each bean sprout in a separate cup that has been filled with potting soil. Lightly water the seeds (be sure not to flood the seed! Too much water will kill the plant!).
2. Cut a small circular hole about 1 inch in diameter in the end of a shoebox.
3. Place 2 or 3 of the planted bean sprouts inside the box and close the lid. Place the shoebox by a sunny window. Place 2 or 3 more planted bean sprouts next to the box to be control plants.
4. In the space provided below, draw a picture predicting how you think the plants in the box will grow. After 5 days check on the plants to see if you can see how the plants are responding to light entering the hole in the box. Draw a picture of these bean plants.

Prediction: Observation on the final day:

Did the plants grow as you predicted? Do you observe any differences between the control bean plant and the plants grown in the box? List them.

Why would response to light be important for plants?