

## Phototropism in Radish Hypocotyls

### Supplies:

- colored cellophane
- cardboard boxes
- soil/potting medium
- shallow containers (3-4 cm. is deep enough)--the container should have enough room for
  - ~20 radish seeds, planted in a row
- radish (*Raphanus sativus*) seeds

### Assessment of growth rate:

Plant ~five seeds, grow the plants **in the dark**, and after five days measure their height (should be ~20 cm).

Then, place the growing container (with potting medium) in one of the cardboard boxes and measure the height of the hypocotyls (plants).

Cut a slot (the entire length of the box) in the cardboard box at a height 5 cm. higher than the height of the plants that you just measured. Put cellophane of the appropriate color over that slot.

### Experiment:

Sow seeds in potting medium that has been well wetted (not sopping, but well-watered); sow the seeds in a row, along the edge of the container closest to the slot. Sow the seeds at a depth of ~1.5 X the length of the seed (or whatever the package instructs--it need not be deeper than a width and a half of the seed).

Place the container into the cardboard box with the planted seeds closest to the edge with the cellophane-covered slot. For controls, you will want to have plants growing in a box with NO slot and also in a box with a slot covered with clear cellophane.

Having assembled the boxes as described, wrap the boxes in aluminum foil, making them light-tight. Allow the seedlings to germinate/elongate in the dark for five days and then remove the aluminum foil from the boxes.

**Three-four hours later** (the response is VERY time-sensitive--you might want to check on the degree of bending periodically), measure the degree of bending. Compare the degree of bending of plants exposed to the different wavelengths of light to that of plants grown in the dark.

It might be a good idea to use a lux meter to determine the intensity of light going through the different filters and comment on that in your Discussion section. You might also want to look under "light receptors" (blue and red) in the literature. There is a large

body of work on light receptors and there is even a fair amount of detail in intro Biology texts.