

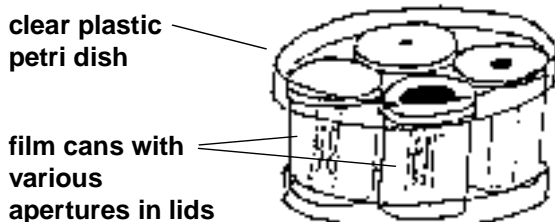
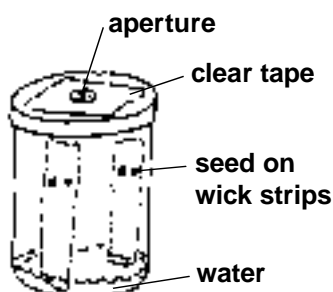


# Photomorphogenesis

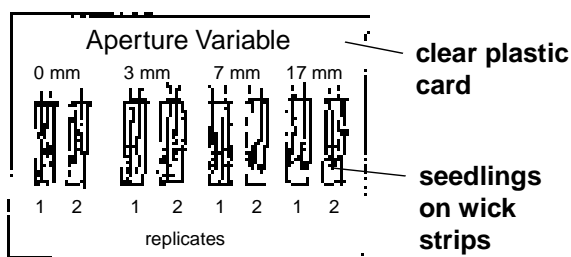
Light is a component of the physical environment that profoundly affects growth and development of plants. The following experiment is designed to provide you with the opportunity to observe how variables in the quantity of light impacting on germinating Fast Plants influences the form that the seedling takes. First you will determine in what terms you will quantify the light variables. Then after observing a range of Fast Plants seedlings grown under varying levels of light you will determine which response variables you will record.

## Procedure

- Groups of students will be given a set of 35 mm film cans in which apertures of varying diameters (0, 3, 7 and 17 mm) have been punched in the lids. Fast Plants seedlings have been grown on wet paper towel strips in each chamber for 72 to 96 hours.



- Open the lids on your chambers, remove the paper strips and adhering seedlings and line them up on a clear plastic card as illustrated.



- Number each seedling consecutively from 1 to n. Observe the seedlings and as a group decide on what appropriate growth response variables would be.
- Students should select examples of continuous variables (metric measurable, e.g., height in mm) and discontinuous or developmental (event) variables. Each student should then measure a particular variable on all the seedlings at each light variable for all the replicates of the group. One metric variable should be selected by all groups and constitute a large class data set. Each variable should be listed on the data sheet and each datum entered. Where possible record the data in quantifiable units.

## Analysis

Students should apply simple statistics such as the arithmetic mean ( $\bar{x}$ ), number of observations ( $n$ ), and range ( $r$ ), to the particular variables they record. Each student in the group should observe the variables being measured by other students in the group and record them in their tables. Other calculations of variation such as the standard deviation ( $sd$ ) may also be used.

## Interpretation

By observing the response variables in seedling growth at different light variables students should provide an interpretation and discussion of their observations. Particular attention should be given to what appears to be correlated responses and to the interpretation that these might have in the seedling stages of plant growth and development.

# Photomorphogenesis Data Sheet

Aperture	Replicate	Plant Variable						
		A	B	C	D	E	F	G
0 mm	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
3 mm	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
7 mm	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
17 mm	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							

**Plant Variables**

A \_\_\_\_\_  
 B \_\_\_\_\_  
 C \_\_\_\_\_  
 D \_\_\_\_\_

E \_\_\_\_\_  
 F \_\_\_\_\_  
 G \_\_\_\_\_