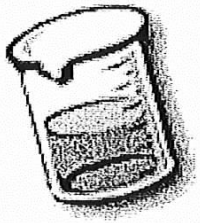
Scientific Method

Seven Step Model

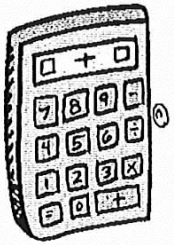
Independent Variable (IV):

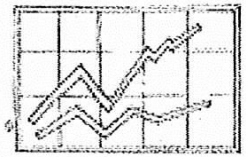


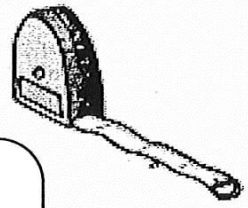
"I Change It!"

The ONE factor changed in the experiment

Dependent Variable (DV):







The "Wait and See" Variable

Or the "Data Collected" Variable

The data collected from changing the IV

Constants:

Time each trial for 3 minutes.

Use 100 mL of water for each trial

All of the factors that will remain the same throughout the experiment

Control:

The group used for comparison. It is either without the independent variable, the most normal situation or there is no control group.

EX: Does fertilizer affect the growth of grass?
Control: no fertilizer

EX: What effect does paper weight have on the time a paper airplane has in the air?
Control: notebook paper

EX: Which ball rolls down the hill further: baseball, golf ball or basketball?
Control: there is no control group

Step 1

Stating the Problem:

Ask as a question that you are going to test.

Ex: How does the amount of sunlight effect the growth of bean plants?

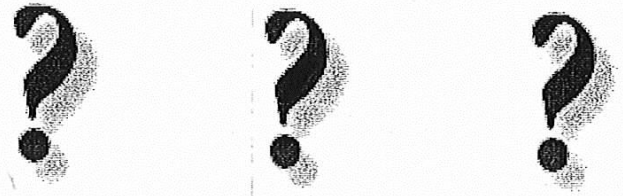
How does the (IV) effect the (DV) ?

Research the Problem

Can be formal or informal depending on the experiment. Students should show consideration for prior thought, experiences, or research.

Step 3

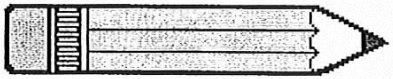
Hypothesis:
(A Testable Prediction)



EX: If the amount of sunlight increases, then the growth of the bean plant will increase.

If the (IV) is (how changed), then the (DV) will (increase, decrease or stay the same).

Writing the Procedure:



- [√] Must have at least 3 steps
- [√] Must tell HOW MUCH to measure
- [√] Must tell when to record data
- [√] Must tell about repeated trials (test at least 3 times)

Data Collection

All graphs MUST have these 4 points to be considered correct

*A title that reflects IV vs. DV

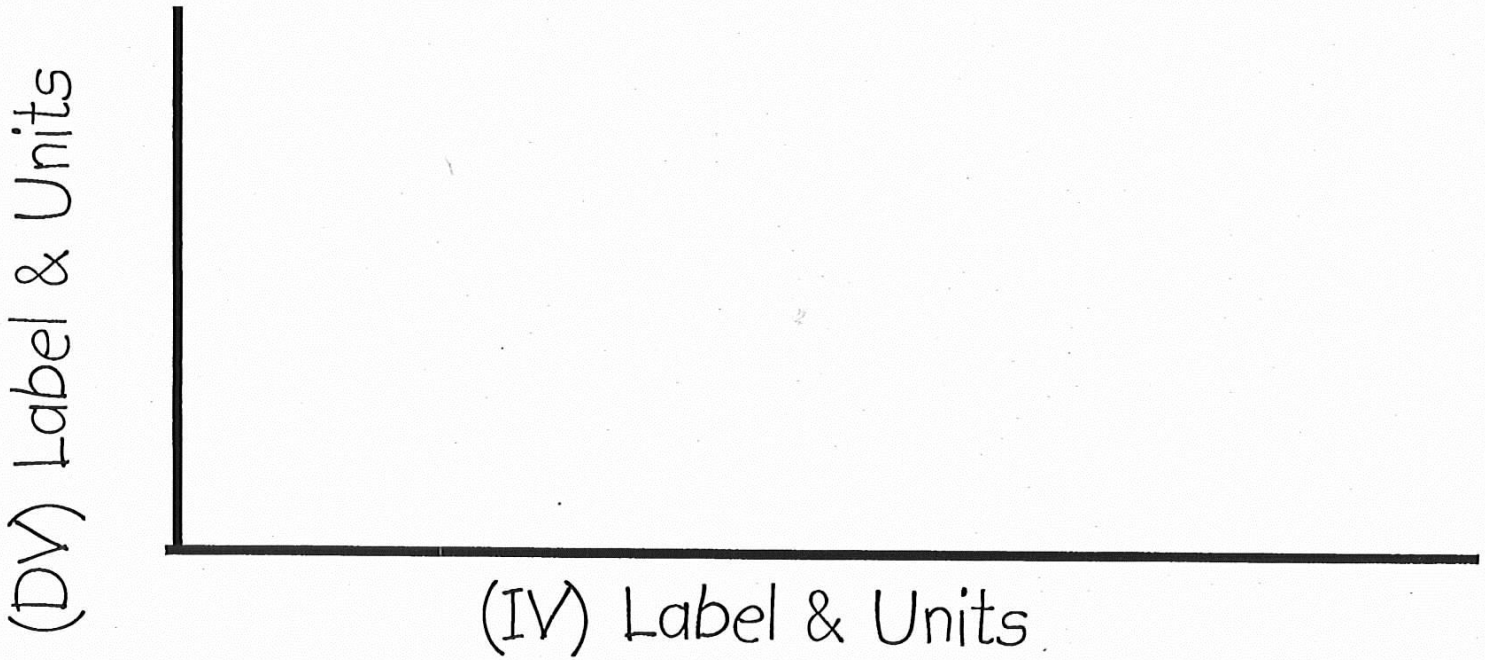
*All axes have both labels and units (X-axis IV and Y-axis is DV)

*Scale used has evenly spaced intervals on BOTH axes

*Data plotted correctly (including making the correct type of graph)

Graphing Data

Title: "The Study of (IV) on (DV)"



Results

A short statement that tells what the gathered data shows.

Ex: Three ring magnets moved a paper clip an average of 5cm more in distance than did one or two magnets.

Conclusions:

√ Was the hypothesis supported?

√ What caused these results?

√ What similar tests could be done?

EX: The hypothesis was correct. The bean plant grew 3cm taller with 4 hours more of sunlight as compared to the normal amount of sunlight. The test I would create next would be to see if the type of soil effects the growth of a bean plant.