# Develop a Model for Plant Growth

Plant four corn seeds in potting soil contained in a Styrofoam cup. Place the cup where the plants will get exposure to the sun, keep the soil slightly moist, and keep track of the height (in cm) of any plants that develop. Measure your plants several times each week - maybe daily. Keep a diary of the life of your plants over a 21-28 day period beginning with the day you plant the seeds.

Before you actually plant the seeds, express your preconceptions concerning the plants' growth over time in the form of a graph. That is, sketch a graph showing how you think the plants' height will change over the next month or so.

At the end of that 21-28 day period, put your data describing your plants' growth into a spreadsheet and produce some graphs. In particular, plot the average height of the plants (in cm) over the 21-28 day time interval. (The exact length of the time interval will be determined later.)

Describe any patterns you observe in the data or in your graphs. What can you say about the plants' growth rate over the time interval?

Try to fit a mathematical relationship to your data.

Your write up for this project should follow the outline below.

Demonstrate the following steps in fitting a model to data relative to a phenomenon.

- Formulate the key problem or question. (Understand the problem.)
- Communicate your preconceptions.
- Collect and organize data. Analyze and interpret data.
- Employ curve fitting techniques or logical analysis and formulate a mathematical model.
- Summarize and report findings. (Reflect, describe, formulate, evaluate, support, generalize, and suggest.)

Sample Results (heights in inches):

| Day | Plant A | Plant B | Plant C | Plant D | Mean Ht | Model |
|---|---|---|---|---|---|---|
| 0 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 3 | 0.00 | 0.25 | 0.00 | 0.00 | 0.06 | 0.06 |
| 6 | 0.00 | 0.25 | 0.00 | 0.00 | 0.06 | 0.19 |
| 9 | 0.00 | 1.00 | 0.25 | 0.25 | 0.38 | 0.60 |
| 12 | 1.00 | 2.00 | 2.00 | 1.00 | 1.50 | 1.75 |
| 15 | 3.00 | 4.25 | 5.00 | 3.00 | 3.81 | 4.07 |
| 18 | 5.00 | 6.00 | 6.00 | 7.00 | 6.00 | 5.99 |
| 21 | 6.25 | 7.00 | 6.00 | 7.25 | 6.62 | 6.53 |
| 24 | 6.50 | 7.50 | 6.00 | 8.00 | 7.00 | 6.78 |