2.MD Growing Bean Plants

Alignments to Content Standards: 2.MD.D.9

Task

a. Students in pairs grow bean plants from seed. In a small glass jar, put a roll of paper towel inside, cut to the height of the jar. Place a bean seed between the paper towel and the glass. Pour around 1 centimeter of water into the bottom of the jar. Place the jar on a window ledge where it will receive light, but preferably not direct sunlight.

b. When the bean seeds start to grow, have the students measure their bean plant every couple of days or so. Students record each measurement with the date in their science books.

c. Record the student pairs’ data on a line plot every few days, depending on how fast the plants grow. Prepare a blank line plot for each ‘measurement day’, and invite each student pair to record the height of their plant on the line plot.

d. Each time the line plot is finished, discuss the patterns evident in the line plot, and compare with earlier line plots.

IM Commentary

Growing bean plants is a common science activity at this age. This task adds some rigor to the activity, by collecting actual growth data, providing practice for students in measuring and recording length measurements. Centimeters are an appropriate unit for these measurements, as they provide a good level of precision for these measurements, while being easy enough for students to handle.

Students will need instruction on how to measure accurately with a ruler. Provide students with rulers marked in centimeters, and point out that a measurement has to
begin at the ‘0’ line. Teach students to measure from the bottom of the seed to the top of the longest shoot to the nearest centimeter.

The line plot provides some useful conceptual scaffolding for this task, helping students to understand how the ‘X’s marked on the graph each represent a specific bean plant. Having student pairs record their own ‘X’ will help them to identify with ‘their’ mark on the graph.

The discussion about the line plots helps to prepare students for more in-depth investigations in later grades, looking at data sets and calculating means, modes, standard deviations and so on. At the grade two level, students can be expected to understand that the ‘shape’ of the graph shows features of the plants as a group (in scientific language, a ‘population’). In the discussion, highlight features such as the outliers (plants that are much taller or shorter than the majority) and the most common sizes. As the plants grow, successive line plots should show all the plants’ data points on the line plots appearing further and further to the right.

Other suggested questions or discussion topics:

- Why is a specific bean plant taller than the rest, or shorter than the rest? Could it be due to different amounts of water, different light levels, or something else?
- What else do you know that grows to different sizes? Talk about pets, farmers’ crops, and people - each individual is a different height, and variation in heights is normal in any population.
- What will the graph look like the next time we measure the plants?
- How tall will the plants become? How could we find out the expected height (check the seed packet, look online, etc.)?

Submitted by Peter Price to the Illustrative Mathematics Task Writing Contest Jan 17 – Jan 30, 2012
Week 2 Line Plot: