

## Soil Temperature Procedure Handout

The following activity simulates the data collection that takes place when determining the accuracy of measuring tools. You will test the accuracy of Vernier temperature probes by taking soil temperatures during a 40-minute time period. You will compare different temperature probes either by working in teams or conducting the experiment individually. **Procedure:**

1. Prepare a soil sample by collecting a cup of soil and dumping it in a beaker. Set aside this samples in the classroom/greenhouse in preparation for data collection the next day.
2. For data collection, obtain a Vernier temperature probe and a LabQuest device.
3. Set the device and probe to record temperatures once a minute for 40 minutes.
4. When set, place the probe into the soil sample and wait for the instructor to tell you to begin collecting.
5. Once everyone's samples are ready to collect data, and at the teacher's mark, hit the play button to begin collecting data.
6. Obtain a graduated cylinder and fill it with 25 ml of water.
7. After the 10th data point is collected, add 25 ml of water to the sample.
8. After completion of the 20th minute, move the samples outside for 10 minutes.
9. After the 30th minute, move the samples back inside for the final 10 minutes.
10. Expect the probe to stop collecting after the 40th minute.
11. Export the data and place it in the *Soil Temperature Spreadsheet* so it is ready for you to begin analysis of the data.
12. When complete, pick up your lab area and clean any utensils before the class period ends.
13. Analyze the data to complete the activity objectives.
  - A. Examine and interpret the temperature data; determine findings and conclusions.
  - B. Find the mean, median, mode, range, and standard deviation of the dataset and its data subsets.
  - C. Based on statistical analysis, determine if the temperature sensor is accurate.
  - D. Based on graphs and data reports, identify the maximum, minimum, mean, and mode of recorded temperatures.