

# VGPS – Vernier GPS Sensor

## Experiment Suggestion

### Goals

- Model data collection with the VGPS Sensor like you might do in an environmental study
- Gain experience with using VGPS and other sensors

### Materials

LabQuest	VGPS Sensor
Infrared Thermometer (IRT)	Temperature Probe

### Procedure

1. **In General:** You will take the equipment to various outdoor places near the workshop site. At each site, you will record the location, the ground or other surface temperature, and the temperature 15 cm above the surface. Choose a variety of surfaces, some in the sun, some in shadow. Keep a record of each surface you measure.
2. Make sure the LabQuest you use is charged up before heading out.
3. Plug the VGPS Sensor into the USB port, and the Infrared Thermometer into CH1 using the adapter cable that comes with it. Plug the Temperature Probe into CH2.
4. Start the LabQuest. Set up data collection for **Selected Events** using the dropdown **Mode** menu.
5. Take the equipment outdoors and wait until the GPS has located the satellites. Move away from buildings if necessary. Latitude and longitude readings will appear on the setup screen when the sensor finds the satellites.
6. Go to your first location. Tap the Collect icon or press the Collect button on the front of the LabQuest. A new “**Keep**” icon will appear on the screen. Point the Infrared Thermometer at the ground and hold the Temperature Probe about 15 cm above the ground. When the readings are steady, tap the **Keep** icon. Do not stop data collection at this point, but you will have recorded your first set of data.
7. Move to a new location, position the IRT and Temperature Probe as before, then press the **Keep** icon when the readings are steady.
8. Repeat these measurements 4-8 times until you have sampled a variety of situations around the workshop location. When finished, tap the Collect icon or press the Collect button to stop data collection. Tap **File > Save** and save your data onto the LabQuest for future work. Give it a spiffy name that is appropriate to your experimentation.

### Analysis

Return to the workshop room. Launch a new file in *Logger Pro*. Connect the LabQuest to the computer using the USB-mini cable. Upload the data into *Logger Pro* and experiment with various ways to display your data. (If you wish, you can upload it to the instructor’s computer so the data can be exported to Google Maps.)