TEACHER INFORMATION

How Tall?
Describing Data with Statistical Plots

1. There are currently four Motion Detectors that can be used for this lab activity. Listed below is the best method for connecting your type of Motion Detector. Optional methods are also included:

   Vernier Motion Detector: Connect the Vernier Motion Detector to a CBL 2 or LabPro using the Motion Detector Cable included with this sensor. The CBL 2 or LabPro connects to the calculator using the black unit-to-unit link cable that was included with the CBL 2 or LabPro.

   MDC
   cable

   CBR: Connect the CBR directly to the graphing calculator's I/O port using the extended length I/O cable that comes with the CBR.

   Optionally, the CBR can connect to a CBL 2 or LabPro using a Motion Detector Cable. This cable is not included with the CBR, but can be purchased from Vernier Software & Technology (order code: MDC-BTD).

   I/O
   cable

   CBR 2: The CBR 2 includes two cables: an extended length I/O cable and a Calculator USB cable. The I/O cable connects the CBR 2 to the I/O port on any TI graphing calculator. The Calculator USB cable is used to connect the CBR 2 to the USB port located at the top right corner of any TI-84 Plus calculator.

   Optionally, the CBR 2 can connect to a CBL 2 or LabPro using the Motion Detector Cable. This cable is not included with the CBR 2, but can be purchased from Vernier Software & Technology (order code: MDC-BTD).

   I/O   USB
   cable   cable

   Go! Motion: This sensor does not include any cables to connect to a graphing calculator. The cable that is included with it is intended for connecting to a computer's USB port. To connect a Go! Motion to a TI graphing calculator, select one of the options listed below:

   Option I–the Go! Motion connects to a CBL 2 or LabPro using the Motion Detector Cable (order code: MDC-BTD) sold separately by Vernier Software & Technology.

   Option II–the Go! Motion connects to the graphing calculator's I/O port using an extended length I/O cable (order code: GM-CALC) sold separately by Vernier Software & Technology.

   Option III–the Go! Motion connects to the TI-84 Plus graphing calculator's USB port using a Calculator USB cable (order code: GM-MINI) sold separately by Vernier Software & Technology.

2. When connecting a CBR 2 or Go! Motion to a TI-84 calculator using USB, the EasyData application automatically launches when the calculator is turned on and at the home screen.

3. The cable must not be allowed to dangle below the Motion Detector, or the height measurements will be unreliable.

4. General features and trends are sometimes hard to detect for small data samples. For best results, use at least 25 students in the class sample. You may wish to combine data sets from several classes for this activity.

5. It is convenient to fasten the Motion Detector to a horizontal ladder or pipe on the ceiling. Many classrooms have projections on the ceiling that can be used. A balcony might also be used.

SAMPLE RESULTS
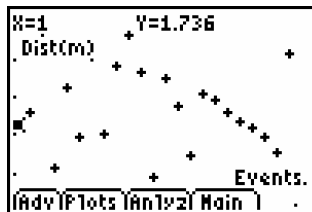
Raw data in EasyData
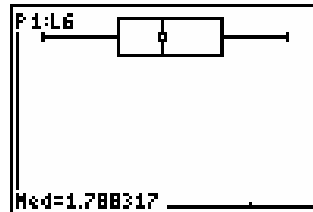
Box Plot

DATA TABLE

n = 29	From data list	descriptive statistics
minimum	1.50 m	1.50 m
median	1.78 m	1.78 m
mean		1.79 m
maximum	2.09 m	2.09 m
Q1		1.68 m
Q3		1.93 m

ANSWERS TO QUESTIONS

1. The maximum, minimum, and median values are the same by direct table inspection as by the calculator's statistics summary, as they should be.

2. The box is somewhat small compared to the range of the whiskers, implying that the class heights are somewhat bunched to the middle values.

3. The median is 1.78 m

4. The whisker location tells us that the shortest person is about as much shorter than average as the tallest person is taller than average.

5. There are no clear outliers, so the answer to the previous question doesn't change.

6. The right-hand whisker would extend considerably, the Q3 value would increase slightly, but the other values would remain the same.

7. The median value would not change, while the Q1 value would increase slightly. The Q3 value would decrease slightly.