

# How Fast Do You Walk?

## Measuring Distance with Sensors

In this tour you will gather data from a motion detector sensor. After the data is gathered, you will construct a mathematical model of the physical situation.

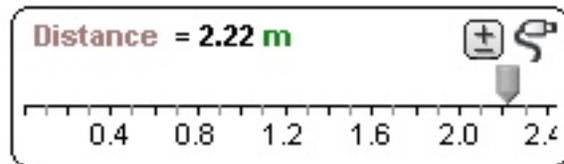
### What You Need

- A Vernier motion sensor—either Go! Motion or Go! Link/LabPro with a motion detector sensor.

### Making Meters

A meter is a Fathom object that connects to a sensor. This experiment requires a distance meter.

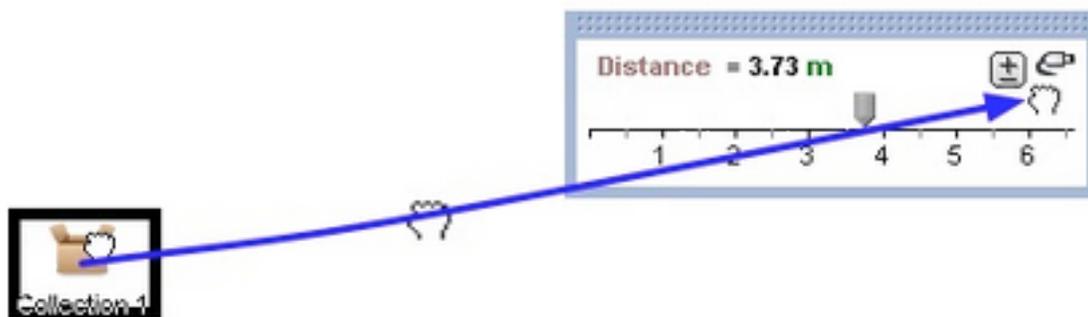
1. Plug the motion sensor into the LabPro and plug the LabPro into the USB port of the computer.
2. Make a distance meter by clicking on the meter icon and dragging it to the document.



The new meter gets the name Distance and begins reporting the distance.

### Setting Up the Fathom Experiment

In Fathom an experiment is represented by a collection connected to one or more meters or sliders.



3. Make a new, empty collection.
4. Drag the plug from the Distance meter and drop it on the collection.

Notice that the name of the collection becomes Experiment with Distance and that the collection icon changes to show that the collection is an experiment collection. Also, the inspector for the collection opens to the Experiment panel.

5. Make a case table for the experiment collection.

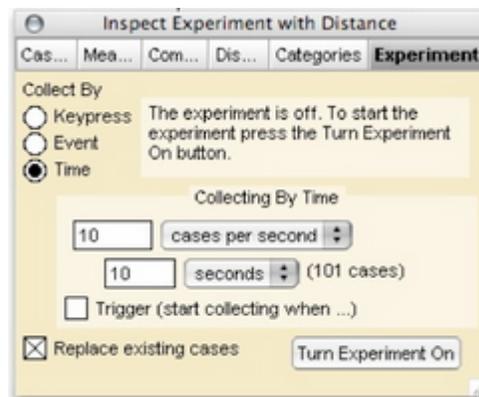
The case table has a column for each of the meters, but no data have yet been gathered.

6. In the Experiment panel of the inspector, click the Turn Experiment On button.

Every second you should see a new case appear in the case table. If so, you're almost ready to gather the "real" distance data. If not, make sure the sensor is properly connected to the computer and try again.

7. Press Turn Experiment Off to turn off the data collection.

8. Check Replace existing cases to get rid of the throwaway data.



## Performing the Experiment

Place the motion sensor on a table. Walk back and forth in front of it a couple of times and you will see the distance values change.

9. Ask a partner to click the Turn Experiment On button.

You might want to change the number of cases per second in the inspector to something more frequent—perhaps 10 cases per second

10. Make a scatter plot showing distance versus time.

11. Add a movable line to the graph (choose Graph | Add Movable Line) and use the slope of the line to estimate your speed.

