Learning to Use a Force Sensor

You can use a Force Sensor to measure the strength of a push or pull. In this activity, you will work with a Force Sensor to learn how it works.

OBJECTIVES

In this activity, you will

- Learn to use the Force Sensor.
- Measure the changing forces as you pull and push on the Force Sensor.
- Match shapes using what you have learned about the Force Sensor.

MATERIALS

computer with Logger Lite software installed
Go!Link interface
Vernier Dual-Range Force Sensor

PROCEDURE

Part I Learn About the Force Sensor

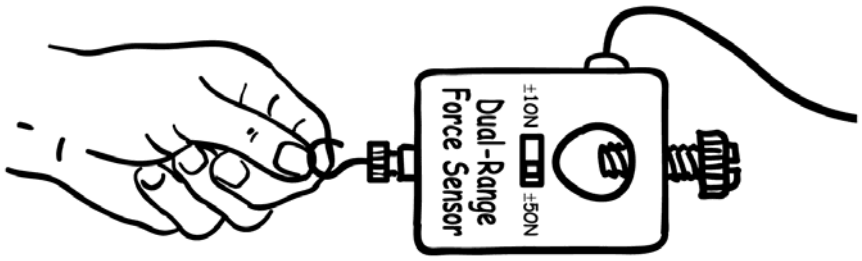
1. Make sure the Force Sensor is plugged into the Go!Link and that the Go!Link is attached to the computer.

2. The Force Sensor has a switch on it. Set the switch to the +/- 50 N setting.

3. Start Logger Lite on your computer. If everything is attached correctly, the LED on the Go!Link will be green and the Logger Lite screen will display a graph, a data table, and a digital meter.

4. Open the file for this activity by doing the following.
   a. Click the Open button,  .
   b. Open the folder called "Elementary Science."
   c. Open the file called "27a Force Sensor."

5. Do the following to collect data using the Force Sensor:
   a. Look at the computer screen and click ▶ Collect to start data collection.
   b. Press very softly on the hook of the Force Sensor and watch what happens on the graph on the computer screen.



   c. Now, press hard on the hook. Watch to see how the force that is being measured is different when you press hard on the hook.
   d. Now, try pulling gently and forcefully on the hook. Watch how the force changes when you push and pull on the hook.
   e. Click ■ Stop to end data collection, if data collection has not ended.

6. In the Observations Sheet below, write what happened to the force when you pushed gently on the hook, when you pressed strongly on the hook, and when you pulled on it.

Observations Sheet
1. When I pushed gently on the hook, the force reading
2. When I pressed strongly on the hook, the force reading
3. When I pulled on the hook, the force reading

Part II Making Faces with the Force Sensor

7. Open the file for this activity by doing the following:
   a. Click the Open button, .
   b. Open the file called "27b Forced Smile."

8. In this part of the activity, you will try to match the smile that you see on the graph. Before you start, think about what happened when you pushed and pulled on the hook of the Force Sensor. Fill in the blanks below as a plan for matching the smile on the graph.

   First, I will not push or pull on the hook for _____ seconds. Then, I will

   _____ (push or pull) the hook until the bottom of the smile is reached. At this

   point, the force will be about _____ N. At the bottom, I will

   _____ to make the force return to about 0 N.

9. Click Collect, then follow the plan you wrote in Step 8, trying to match the smile.

10. If the data you collected matches the smile, congratulations! You can move on to the next step. If you want to try match the smile again, just click Collect and repeat the plan you wrote in Step 8.

11. After you've made the smile, you will try to match a frown. To get ready, do the following things:
    a. Click the Open button, .
    b. Open the file called "27c No Frowning."

12. On the lines below, write down the plan you would follow to match the frown shape. Use the words in Step 8 as a pattern.

    Plan for making a frowning face:

    _____

    _____

    _____

    _____

13. Click Collect, then follow the plan you wrote in Step 12.

14. If the graph looks like a frown, congratulations! If you want to try to make the frown again, just click ▸Collect and repeat the steps you wrote in Step 12.

    Good job!!