Sample Activity: *Could I use an Accelerometer as a Pedometer?*

Invite students to investigate accelerometer data as they move around - can they identify x, y and z axes?

Could they use the accelerometer to count the number of steps they take when walking?

How does this correspond to the other movement sensors? How might they design experiments that will reveal the meaning of what they see?

Perhaps link these sensors to a heart rate monitor and study the effects when exercising, or dancing?

Sensors: Accelerometer

Step 1: Connect	
(1.1) Turn on your TI SensorTag and open the TI_SensorTag.tns document.	
(1.2) Press **'Scan'** and wait for the checklist of sensors.	
(1.3) Select **Accelerometer** (as shown).	
(1.4) Tap on the blue **CC2650 SensorTag** button at the top left.	
(1.5) Wait for the Sensor readings to appear and begin to change.	
You are now connected – time to grab some data points!	

http://compasstech.com.au/sensortag/
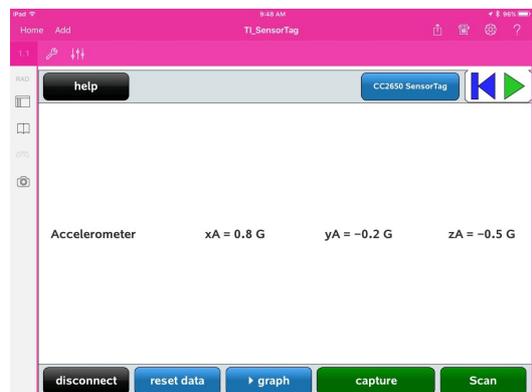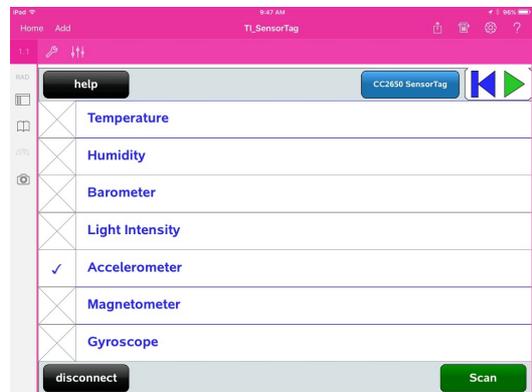
Step 2: Capturing Some Data

(2.1) Tap on the centre of the screen. You will see the data window change to a graph window, as shown.

Note that pressing the blue **'reset data'** button will clear the current data set and start again from time 0 – a useful feature so that you don't overload the iPad with too much data! Try pressing that blue button a couple of times and see the effect.

Step 3: Putting your Data to Work

(3.1) Now go for a walk around the room, counting the number of steps. Press the pause button (the green triangle in the top right corner) and see if you can match the 3D accelerometer plot to your steps!

(3.2) Press the **'reset data'** button. Now tap on the page sorter button towards the top of the left side panel:

Use the page sorter to move to page 1.5 (as shown – there may be a slight lag as you leave page 1.1 as the data is collected in the background). Here we use the accelerometer to control the movement of the 3D molecules. Try placing the SensorTag on a table in various positions – can you identify the three axes?

On page 1.7 you will see two graph screens – on the left, a point controlled by the accelerometer values; on the right – a vector controlled by magnetometer values.
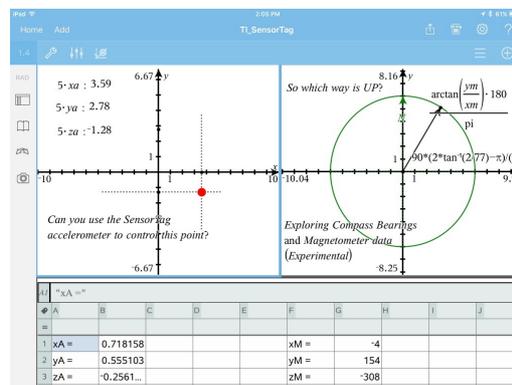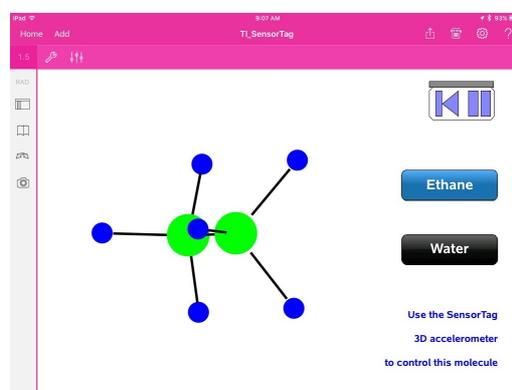
Your challenge: Is it possible to use the SensorTag accelerometer to **reliably** control the movement of a point on the screen, like a computer mouse? Think about how this might be achieved.

What about using the magnetometer as a compass?

What are the likely limitations of explorations such as these?

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