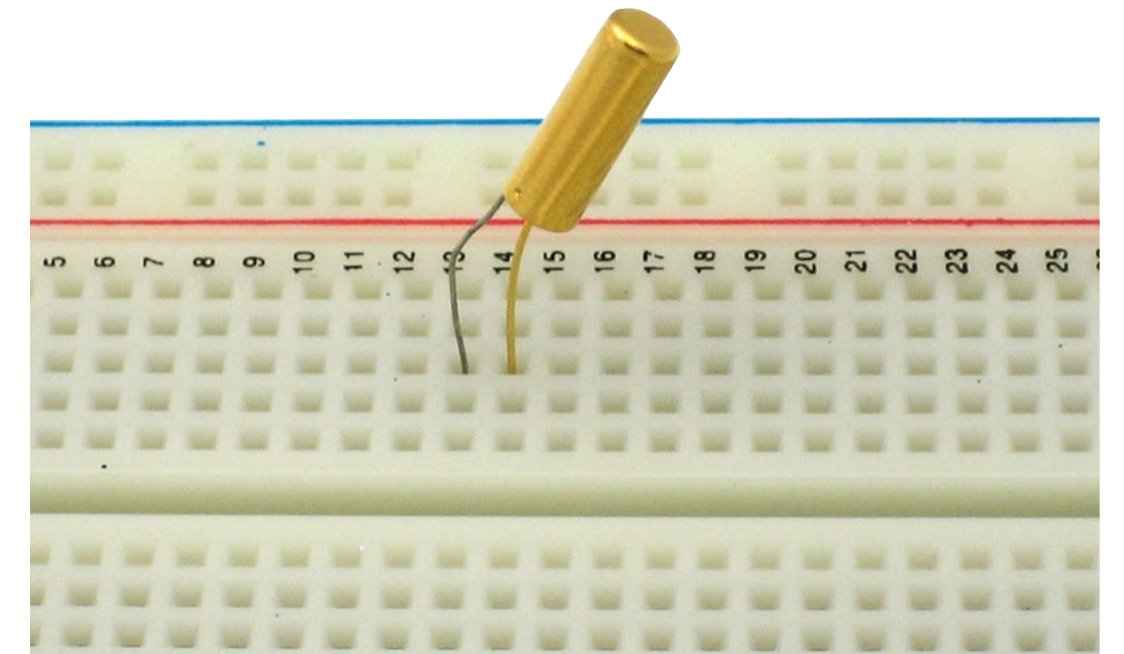
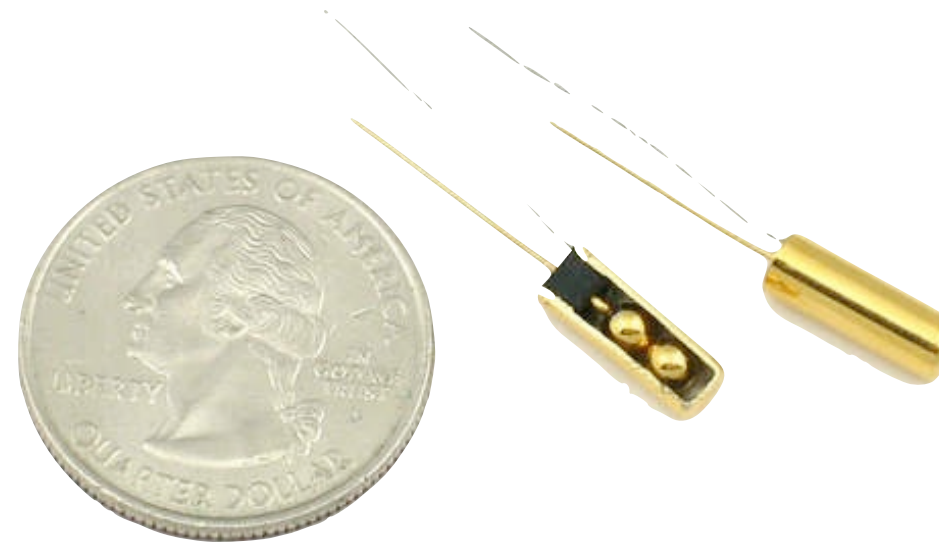


Tilt Sensor

Super-fun switch that responds to tilting

Tilt sensor

- Responds to change in orientation
- Has moving conductive material inside, such as a rolling ball or blob of mercury
- Is an on/off switch only (no in-between)

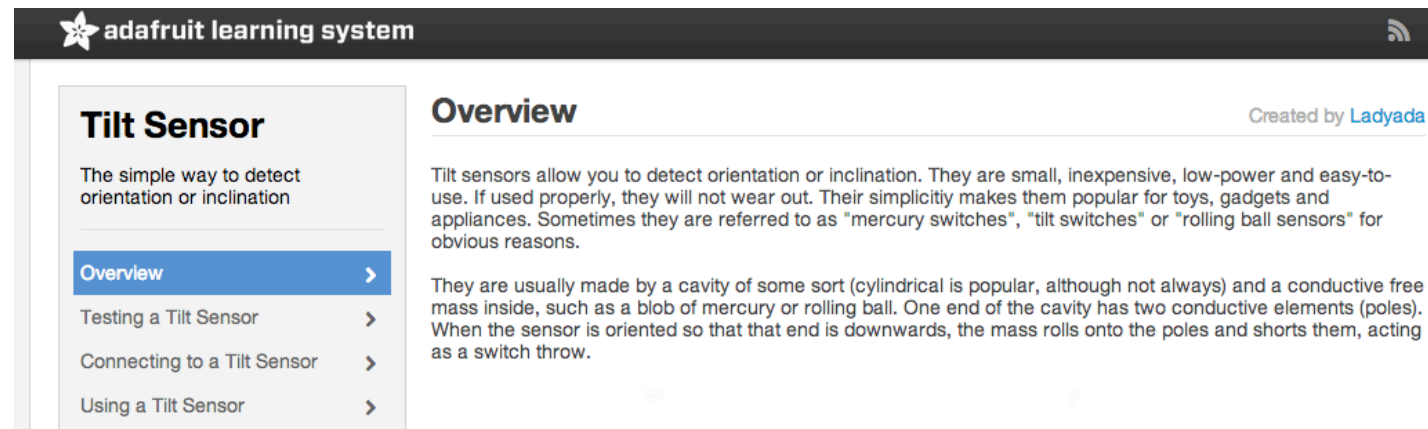


Tilt sensor in action
(embedded video available at <https://vimeo.com/51713960>)



can be used in interactive toys, or any items
with large, imprecise movements

Handy tutorials on Adafruit and Arduino websites



The screenshot shows the Adafruit Learning System interface. At the top, there is a dark header with the Adafruit logo and the text "adafruit learning system". Below the header, on the left, is a sidebar with a "Tilt Sensor" section. Under this section, there is a sub-section "Overview" which is highlighted in blue. Below "Overview" are four other sub-sections: "Testing a Tilt Sensor", "Connecting to a Tilt Sensor", and "Using a Tilt Sensor", each with a right-pointing arrow. The main content area on the right is titled "Overview" and includes the text: "Tilt sensors allow you to detect orientation or inclination. They are small, inexpensive, low-power and easy-to-use. If used properly, they will not wear out. Their simplicity makes them popular for toys, gadgets and appliances. Sometimes they are referred to as 'mercury switches', 'tilt switches' or 'rolling ball sensors' for obvious reasons." Below this text, there is a paragraph: "They are usually made by a cavity of some sort (cylindrical is popular, although not always) and a conductive free mass inside, such as a blob of mercury or rolling ball. One end of the cavity has two conductive elements (poles). When the sensor is oriented so that that end is downwards, the mass rolls onto the poles and shorts them, acting as a switch throw."

<http://learn.adafruit.com/tilt-sensor>

<http://www.arduino.cc/en/Main/TutorialTiltSensor>

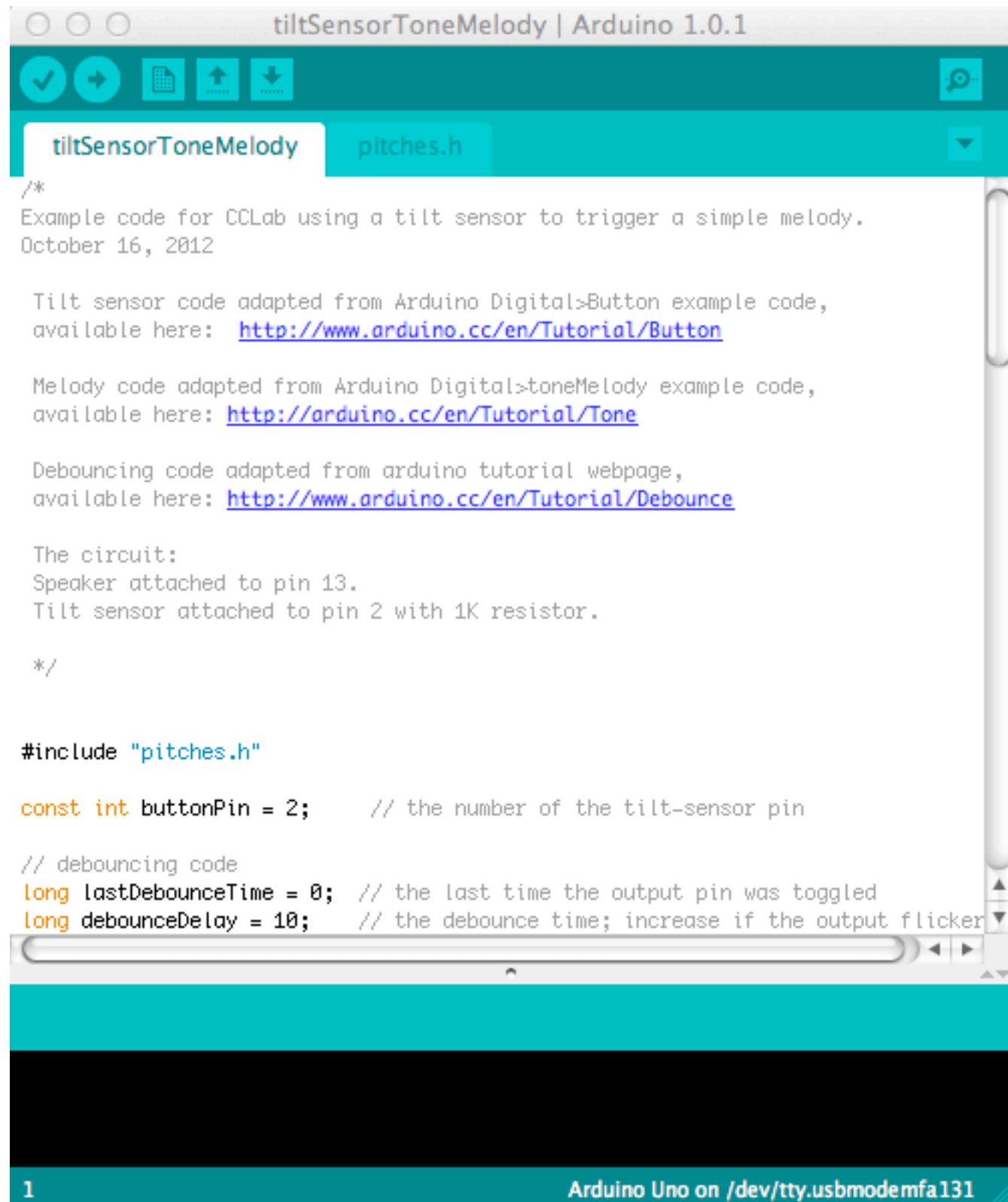


[Buy](#) [Download](#) [Getting Started](#) [Learning](#) [Reference](#) [Products](#) [FAQ](#) [Contact Us](#)

Tilt Sensor

The tilt sensor is a component that can detect the tilting of an object. However it is only the equivalent to a pushbutton activated through a different physical mechanism. This type of sensor is the environmental-friendly version of a mercury-switch. It contains a metallic ball inside that will commute the two pins of the device from on to off and viceversa if the sensor reaches a certain angle.

Code for simple melody triggered by tilt sensor



```
tiltSensorToneMelody | Arduino 1.0.1
tiltSensorToneMelody pitches.h
/*
Example code for CCLab using a tilt sensor to trigger a simple melody.
October 16, 2012

Tilt sensor code adapted from Arduino Digital>Button example code,
available here: http://www.arduino.cc/en/Tutorial/Button

Melody code adapted from Arduino Digital>toneMelody example code,
available here: http://arduino.cc/en/Tutorial/Tone

Debouncing code adapted from arduino tutorial webpage,
available here: http://www.arduino.cc/en/Tutorial/Debounce

The circuit:
Speaker attached to pin 13.
Tilt sensor attached to pin 2 with 1K resistor.

*/

#include "pitches.h"

const int buttonPin = 2;    // the number of the tilt-sensor pin

// debouncing code
long lastDebounceTime = 0;  // the last time the output pin was toggled
long debounceDelay = 10;   // the debounce time; increase if the output flicker

void setup() {
  pinMode(buttonPin, INPUT);
  pinMode(13, OUTPUT);
}

void loop() {
  if (digitalRead(buttonPin) == HIGH) {
    if (millis() - lastDebounceTime >= debounceDelay) {
      digitalWrite(13, HIGH);
      lastDebounceTime = millis();
    }
  }
}
```

https://github.com/jenniferpresto/ccLab_Fall_2012/tree/master/tiltSensorToneMelody

Note that the code includes debouncing code, which smooths the signal coming from the sensor (by requiring two readings separated by a slight delay) and makes it more reliable. The output from the sensor can otherwise be shaky, as the sensor can be sensitive to vibrations.

Retailers:

Sparkfun (\$1.95):

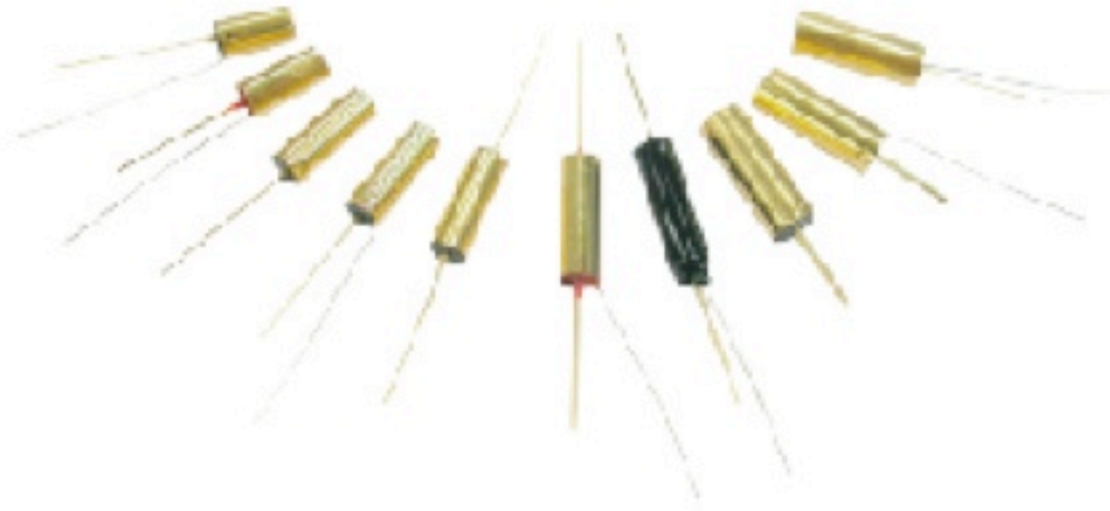
<https://www.sparkfun.com/products/10289>

Adafruit (\$2.00):

<http://www.adafruit.com/products/173>



Tilt Switch Ball-Rolling Switch AT Series



SPECIFICATION

- Electrical Rating : <6mA 24VDC
- Electrical Life: >50,000 Cycles
- Contact Resistance: 1 Ω
- Solder Temperature: 250°C 3 Seconds
- Ambient Temperature: 0°C~100°C

MATERIAL

- Canister: Copper Gold Plated
- Electrode: Copper Gold Plated
- Rolling Ball: Stainless Steel Gold Plated
- Insulated Piece: Nylon 46(94V-0)

data sheet can be found here:

<http://www.sparkfun.com/datasheets/Sensors/Ball-Rolling%20Switch%20AT.pdf>