

<http://playground.arduino.cc/Main/CapacitiveSensor>

The capacitiveSensor library turns two or more Arduino pins into a capacitive sensor, which can sense the electrical capacitance of the human body. All the sensor setup requires is a medium to high value resistor and a piece of wire and a small (to large) piece of aluminum foil on the end. At its most sensitive, the sensor will start to sense a hand or body inches away from the sensor.

Have a look also a Pencil Based Capacitive Sensor

<http://www.bareconductive.com/capacitance-sensor>

Tutorial about touch sensors features

<http://www.instructables.com/id/Touche-for-Arduino-Advanced-touch-sensing/>

https://www.youtube.com/watch?v=ikD_3Vemkf0

HARDWARE REQUIRED

Arduino Board

1 LED

1 470 Ω hm Resistor

1 $1\text{M}\Omega\text{hm}$ Resistor (Test the values using $5\text{M}\Omega$ up to $50\text{M}\Omega$ resistors)

breadboard

hook-up wire

CIRCUIT

Resistor Choice

Here are some guidelines for resistors but be sure to experiment for a desired response. Use a 1 megohm resistor (or less maybe) for absolute touch to activate.

With a 10 megohm resistor the sensor will start to respond 4-6 inches away.

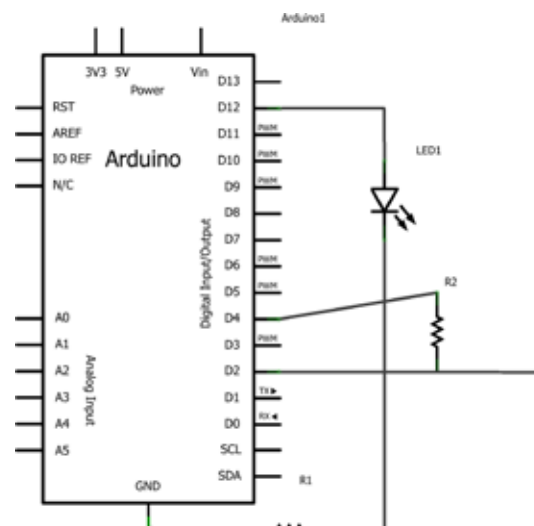
With a 40 megohm resistor the sensor will start to respond 12-24 inches away (dependent on the foil size). Common resistor sizes usually end at 10 megohm so you may have to solder four 10 megohm resistors end to end.

One tradeoff with larger resistors is that the sensor's increased sensitivity means that it is slower. Also if the sensor is exposed metal, it is possible that the send pin will never be able to force a change in the receive (sensor) pin, and the sensor will timeout.

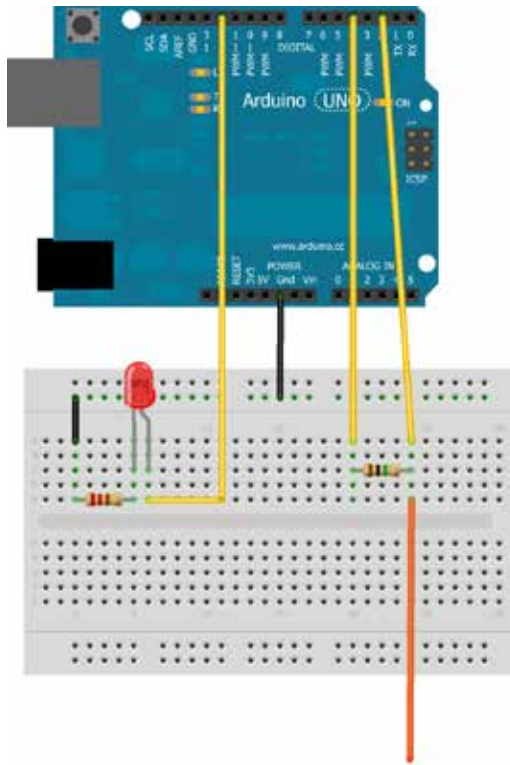
Also experiment with small capacitors (100 pF - .01 uF) to ground, on the sense pin. They improve stability of the sensor.

Note that the hardware can be set up with one sPin and several resistors and rPin's for calls to various capacitive sensors. See the example sketch.

SCHEMATIC



IMAGE



CODE

```
/*  
  Arduino Starter Kit example  
  Project 13 - Touch Sensor Lamp  
  
  This sketch is written to accompany Project 13  
  in the  
  Arduino Starter Kit  
  
  Parts required:  
  1 Megohm resistor  
  metal foil or copper mesh  
  220 ohm resistor  
  LED  
  
  Software required :  
  CapacitiveSensor library by Paul Badger  
  http://arduino.cc/playground/Main/  
  CapacitiveSensor  
  
  Created 18 September 2012  
  by Scott Fitzgerald  
  
  http://arduino.cc/starterKit  
  
  This example code is part of the public domain  
  */  
  
// import the library (must be located in the  
// Arduino/libraries directory)  
#include <CapacitiveSensor.h>  
  
// create an instance of the library  
// pin 4 sends electrical energy  
// pin 2 senses a change  
CapacitiveSensor capSensor = CapacitiveSensor(4,2);  
  
// threshold for turning the lamp on  
int threshold = 1000;  
  
// pin the LED is connected to  
const int ledPin = 12;  
  
void setup() {  
  // open a serial connection  
  Serial.begin(9600);  
  // set the LED pin as an output  
  pinMode(ledPin, OUTPUT);  
}  
  
void loop() {  
  // store the value reported by the sensor in a variable  
  int sensorValue = capSensor.capacitiveSensor(30);  
  
  // print out the sensor value  
  Serial.println(sensorValue);  
  
  // if the value is greater than the threshold  
  if(sensorValue > threshold) {  
    // turn the LED on  
    digitalWrite(ledPin, HIGH);  
  }  
  // if it's lower than the threshold  
  else {  
    // turn the LED off  
    digitalWrite(ledPin, LOW);  
  }  
  
  delay(50);  
}
```