Physical Computing with Arduino

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www.arduino.cc

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Overview

- What is Arduino?
- Hardware
- Programming the Arduino
- RAD
- Poor Man's Theramin sketch & demo
- Questions

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Open Source

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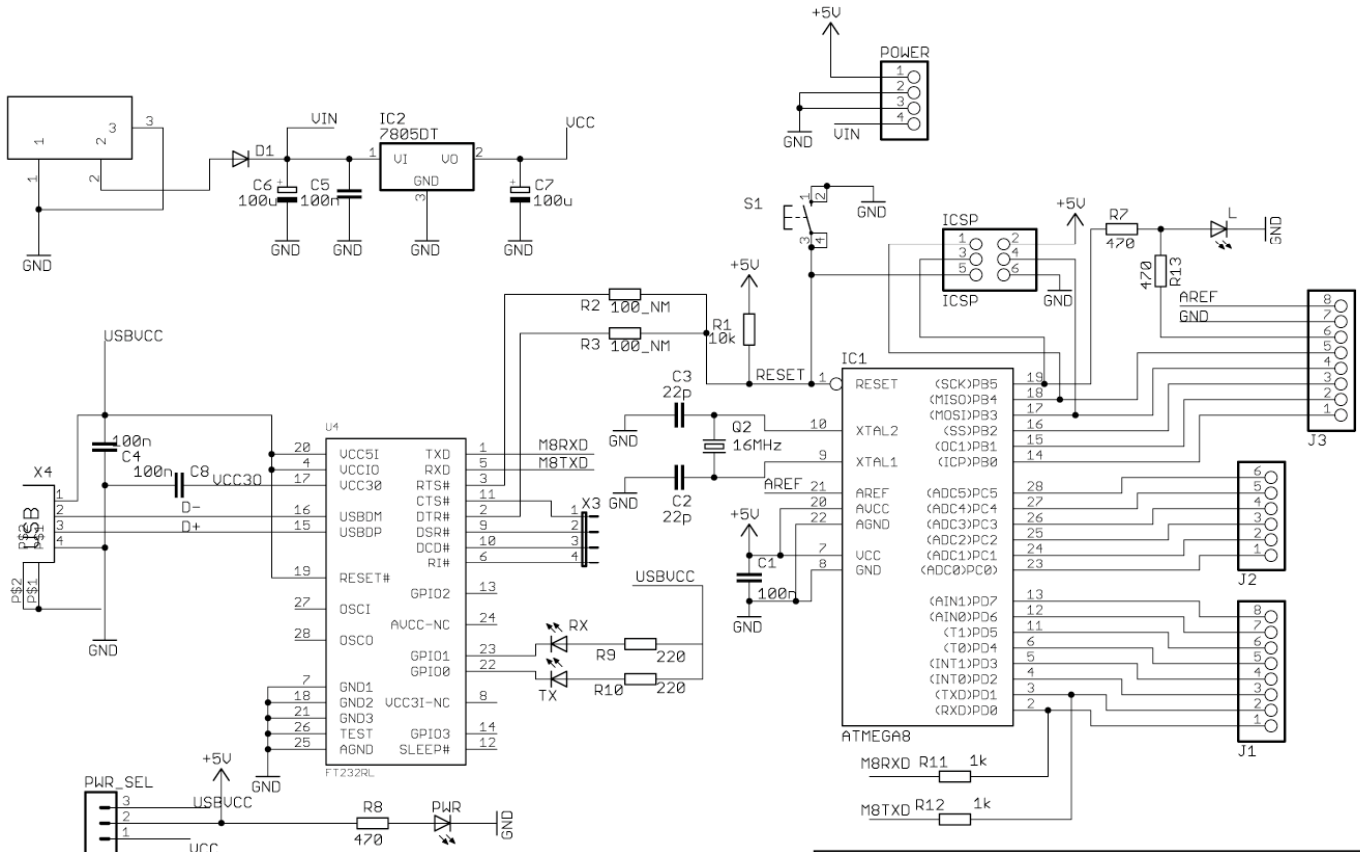

Arduino Nuova Generazione (NG) v.4.0
Part of the Arduino project http://www.arduino.cc

Designed in Italy by the Arduino Team
Engineered by Gianluca Martino http://www.smartprojects.it

Made in Italy

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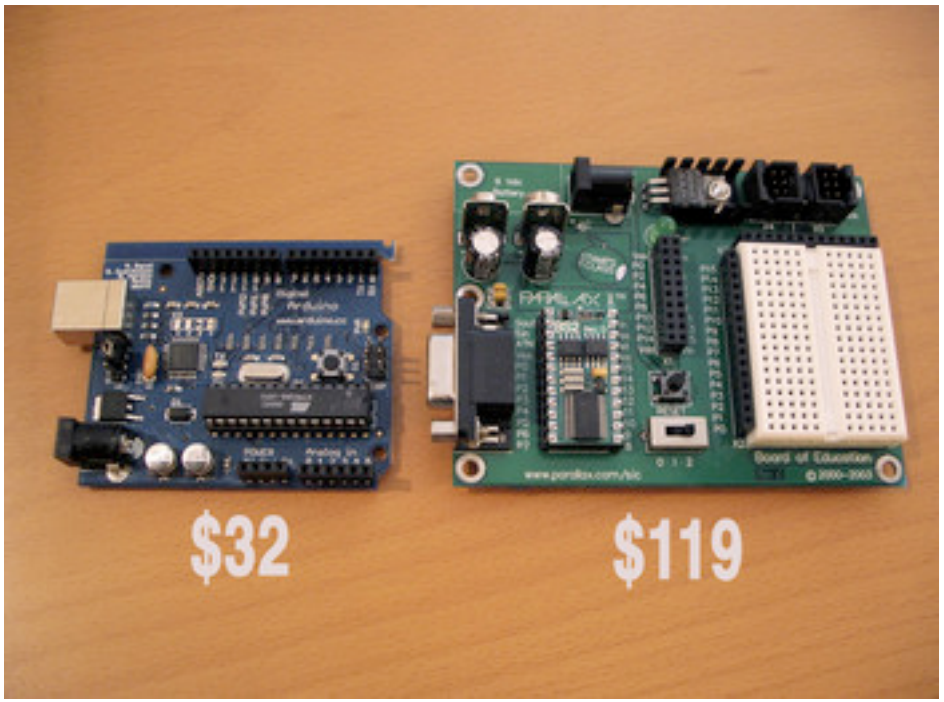
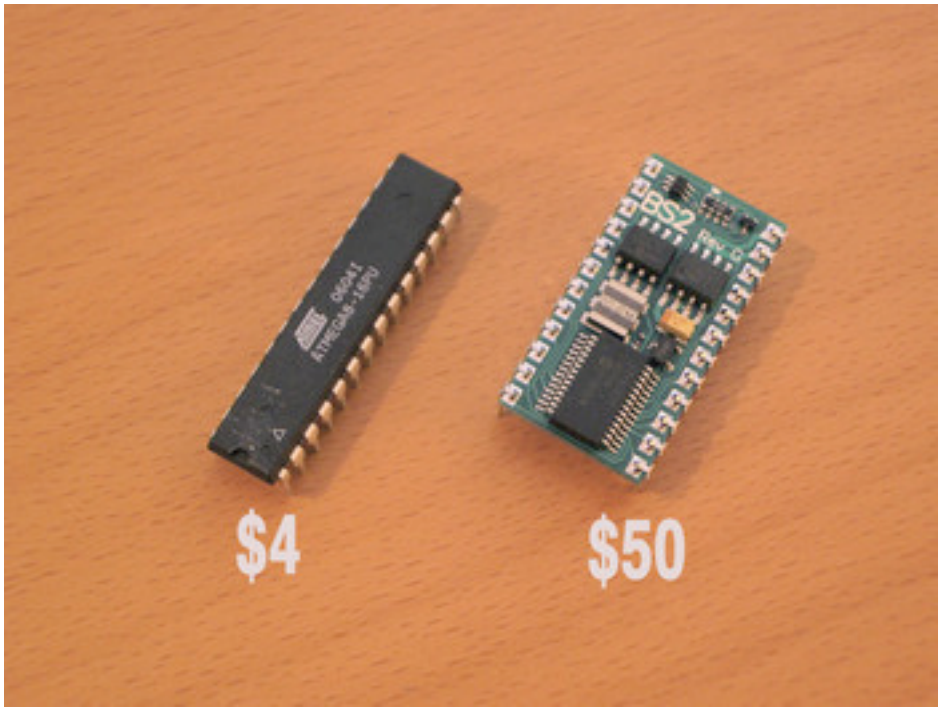
Cheap





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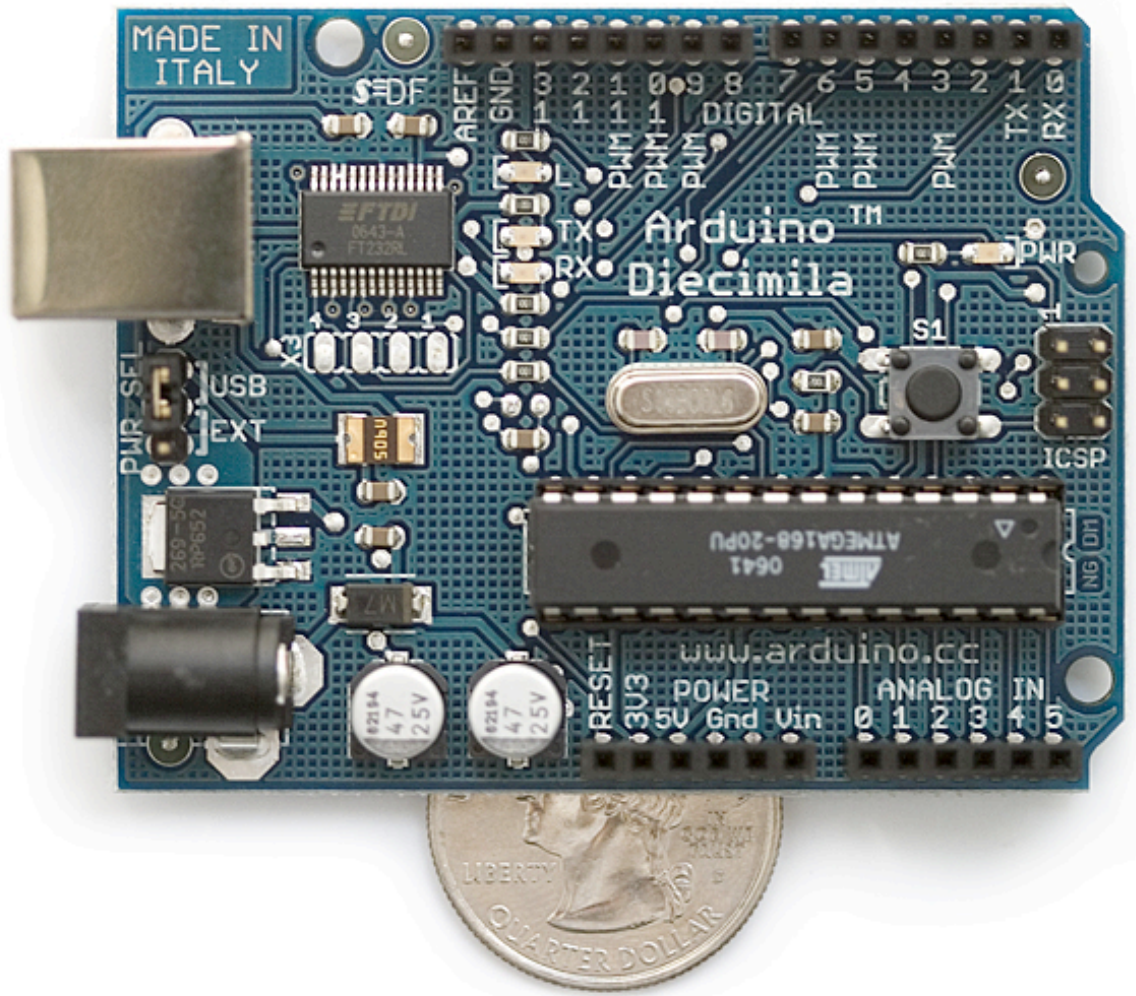
http://todbot.com/blog/2006/09/25/arduino-the-basic-stamp-killer/

Arduino USB



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http://www.sparkfun.com/commerce/product_info.php?products_id=666#

Other Flavors

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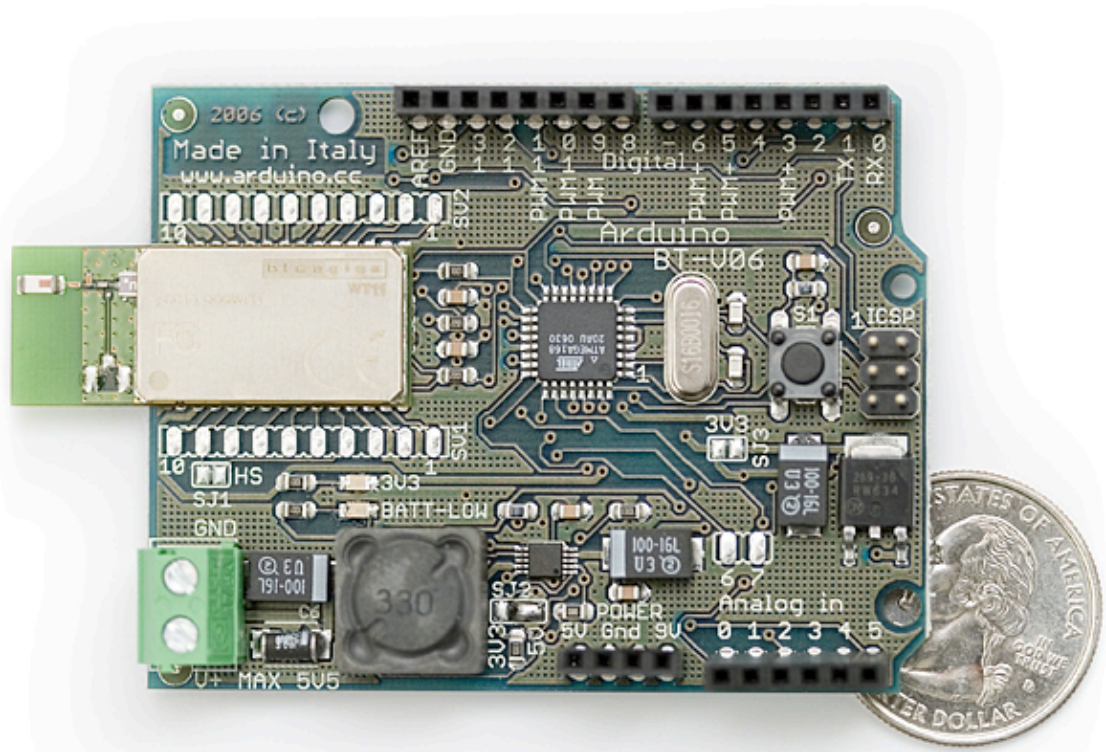
Arduino Bluetooth



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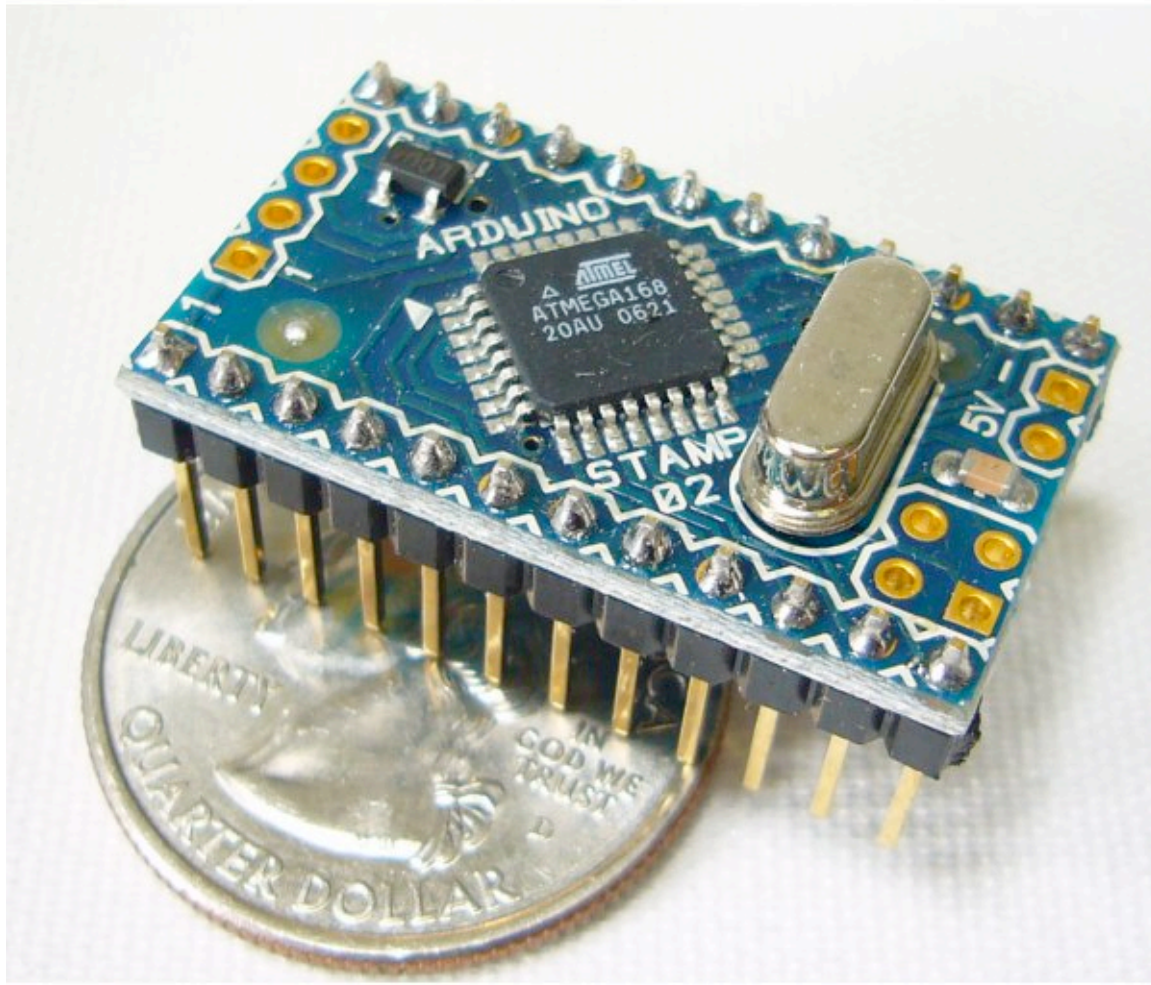
http://www.sparkfun.com/commerce/product_info.php?products_id=8255

Arduino Stamp



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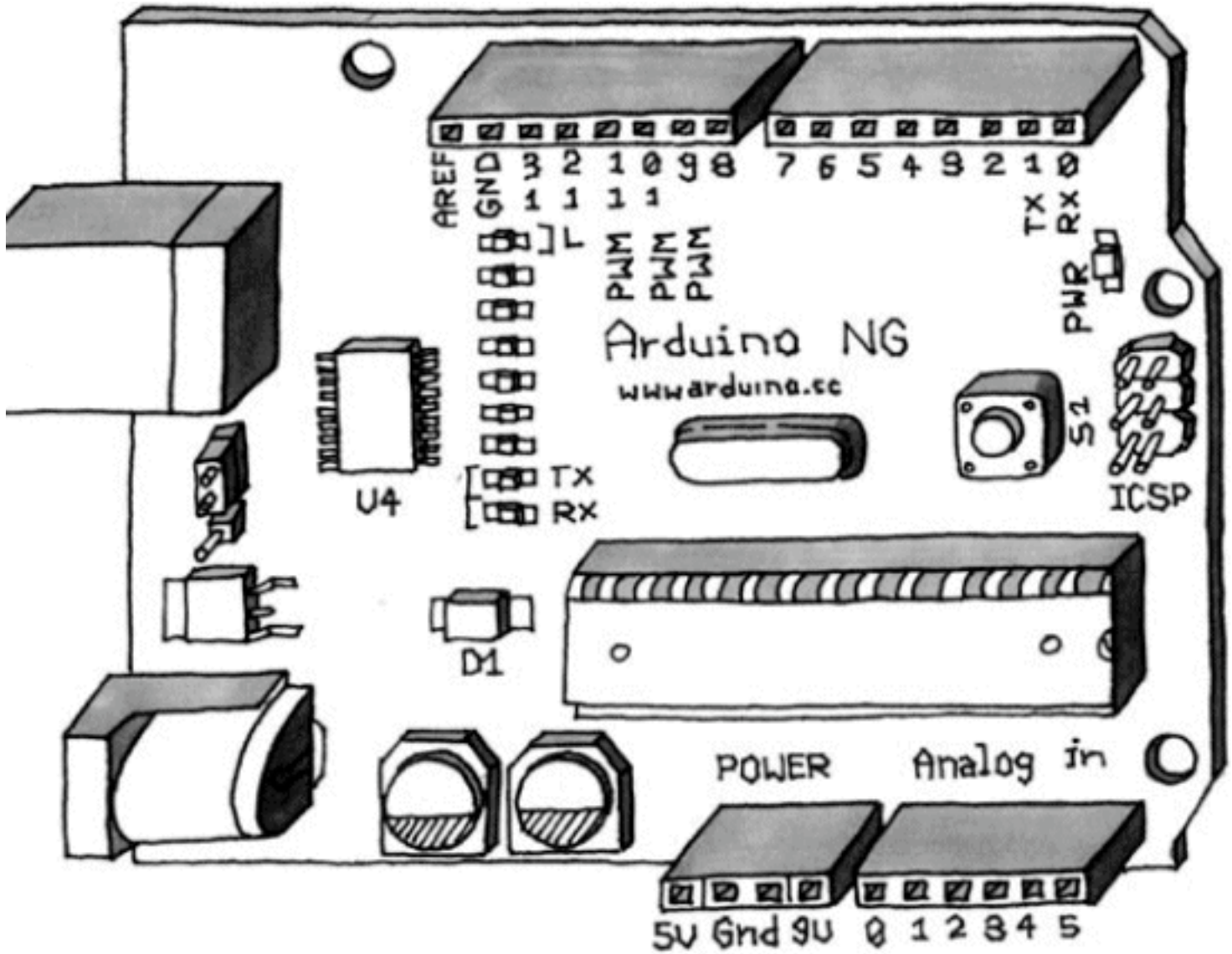
http://www.sparkfun.com/commerce/product_info.php?products_id=8164

Board Overview



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http://www.csc.kth.se/utbildning/kth/kurser/DH2400/interak06/arduino_images/arduino-layoyut.gif

Programming

- Arduino Programming Language
- Based on Wiring (www.wiring.org.co/)
- Development Environment
- Based on Processing (www.processing.org/)
- C Like Syntax
- Super Easy

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Code Sample

```
int ledPin = 13;   // LED connected to digital pin 13

void setup()
{
  pinMode(ledPin, OUTPUT); // sets the digital pin as output
}

void loop()
{
  digitalWrite(ledPin, HIGH);  // sets the LED on
  delay(1000);                 // waits for a second
  digitalWrite(ledPin, LOW);  // sets the LED off
  delay(1000);                // waits for a second
}
```

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Could it be easier?

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Duh, with Ruby.

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Ruby Arduino Development

- http://rad.rubyforge.org/
- Builds Rails like file structure for your sketch
- Code with Ruby
- Rake tasks

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RAD Sample

```
class MySketch < ArduinoSketch
  output_pin 7, :as => :led
  def loop
    blink led, 500
  end
end
```

rake make:upload

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http://rad.rubyforge.org/

Poor Man's Theramin

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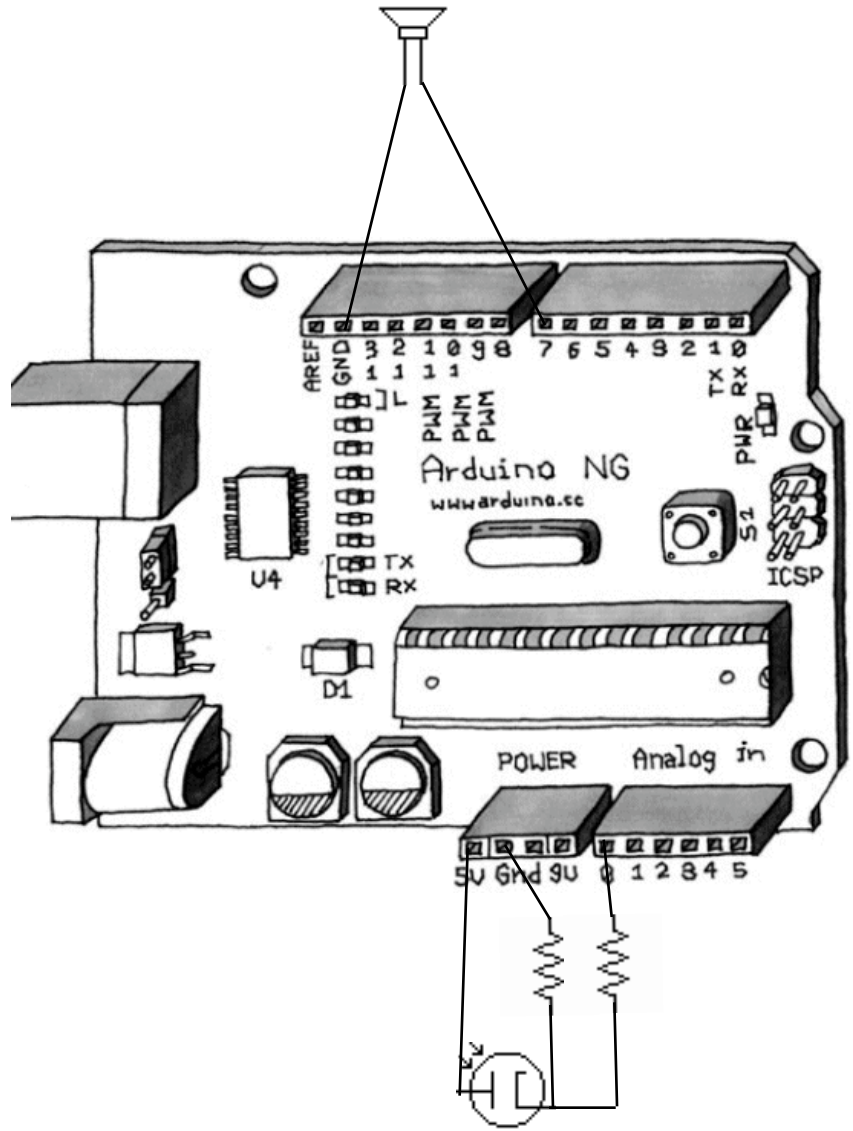
Connect the Hardware



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Initialize Variables

```
int buzzer = 7;
int delay_value = 0;
int photo_cell = 0;
```

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Setup Routine

```
void setup(void) {
  pinMode(buzzer, OUTPUT);
}
```

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Main Loop

```
void loop(void) {
  delay_value = analogRead(photo_cell);
  digitalWrite(buzzer, HIGH);
  delayMicroseconds(delay_value);
  digitalWrite(buzzer, LOW);
  delayMicroseconds(delay_value);
}
```

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Demo

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Questions?

(That I'll try to answer...)

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Thanks to the Orlando Barcamp folks!