### Bloominglabs AVR Workshop

#### Legend:
- **VCC** = +5V
- **GND** = ground
- ISP = In-System-Programmer port
- PDIP = chip form factor, Plastic Dual-Inline-Pin
- Port B = pins 14-19, 9, 10
- Port C = pins 23-28, 1
- Port D = pins 2-6, 11, 12

#### Programmer connections:
(Do NOT connect +5 from programmer to breadboard!)
- 1 = reset
- 19 = SCK
- 18 = MISO
- 17 = MOSI
- 22 = GND

#### ATMega8 Pinout

![ATMega8 Pinout Diagram]

#### Programmer pinouts:
(Do NOT connect +5 from programmer to breadboard!)

- MOSI
- SCK
- RESET
- +Vcc
- (NC)
- Ground

#### Voltage Regulator Pinout:
![Voltage Regulator Pinout Diagram]

Pin 2 = ground for input and output

#### LED Pinout:

![LED Pinout Diagram]

#### RGB LED Pinout
(blue and green are reversed)

![RGB LED Pinout Diagram]

More AVR info: [www.avrfreaks.net](http://www.avrfreaks.net)
AVRDUDE Setup Tutorial: [www.ladyada.net/make/usbtinyisp/avrdude.html](http://www.ladyada.net/make/usbtinyisp/avrdude.html)
Resistor Color Codes

<table>
<thead>
<tr>
<th>Color</th>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black</td>
<td>0</td>
<td>Bad</td>
</tr>
<tr>
<td>Brown</td>
<td>1</td>
<td>Boys</td>
</tr>
<tr>
<td>Red</td>
<td>2</td>
<td>Race</td>
</tr>
<tr>
<td>Orange</td>
<td>3</td>
<td>Our</td>
</tr>
<tr>
<td>Yellow</td>
<td>4</td>
<td>Young</td>
</tr>
<tr>
<td>Green</td>
<td>5</td>
<td>Girls</td>
</tr>
<tr>
<td>Blue</td>
<td>6</td>
<td>Behind</td>
</tr>
<tr>
<td>Violet</td>
<td>7</td>
<td>Victory</td>
</tr>
<tr>
<td>Grey</td>
<td>8</td>
<td>Garden</td>
</tr>
<tr>
<td>White</td>
<td>9</td>
<td>Walls</td>
</tr>
</tbody>
</table>

How the Solderless Bread Board works:
(Image and text borrowed from http://www.ladyada.net/learn/arduino/lesson3.html)

In the images above you can see how there are two kinds of metal strips. There are short ones that connect 5 row holes at a time, and then there are very long ones that connect 25 (or more!) column holes at a time. The long columns are called rails and the short strips are called rows. Breadboards are almost always made so that they have two sets of 5-hole rows and on either side there are a pair of rails. For example the breadboard on the left has 30 row pairs and 2 sets of double rails on either side. The one on the right is quite small, it has only 17 row pairs and no rails.

Warning!
Distressing as it may sound, solderless breadboards can be very flakey, especially as they age. If you’re having problems with your circuit, it could be that the little metal clips on the inside aren’t working well. Try poking it with your finger, or moving it to a different section.