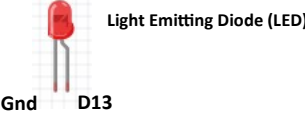

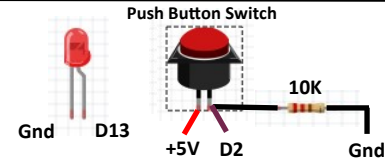
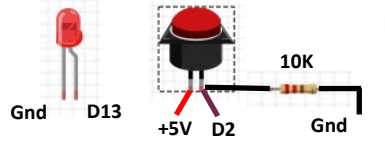
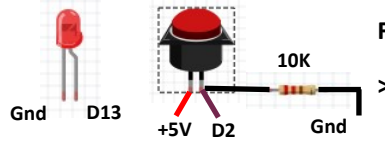
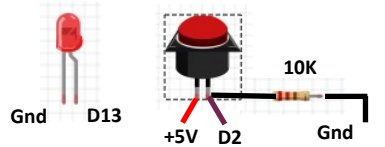

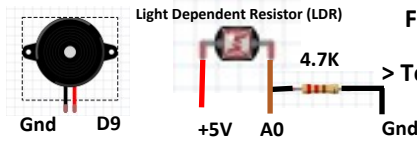
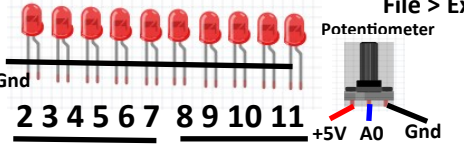
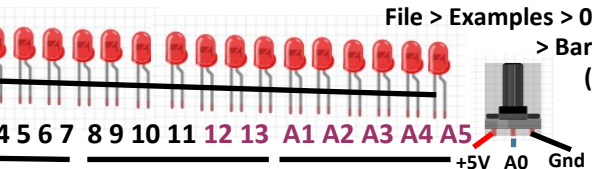


Pat's Plug & Code - Using "Examples" from the Arduino IDE.

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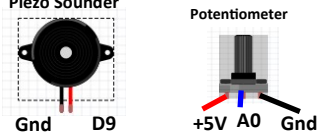

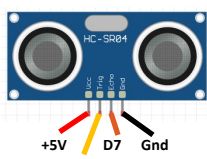

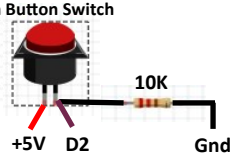

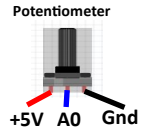

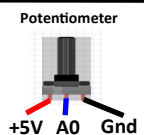

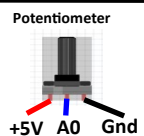

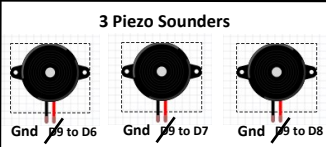

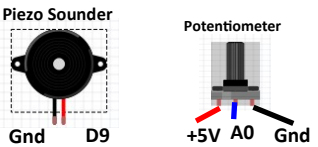

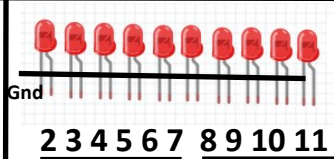

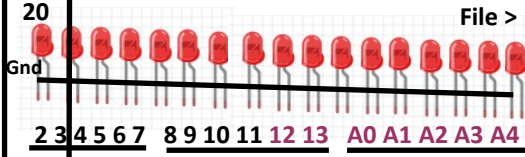

Note—As these "examples" are from the Public Domain, some use different pins. Attach as per the diagrams below and in the Sketches notes. Also use the links in the Sketches to get detailed information and diagrams. **Study each Sketch to Learn!**

No	On the Arduino IDE, go to the following, maximise screen and Upload.	What Happens!
1	 <p>Light Emitting Diode (LED)</p> <p>Gnd D13</p> <p>File > Examples > 01. Basics > Blink ></p>	<p>Connect the LED Lead to Gnd & D13.</p> <p>LED blinks On and Off.</p> <p>Try changing each of the delay(1000) values.</p>
2	 <p>Gnd D13 to D9</p> <p>File > Examples > 01. Basics > Fade ></p>	<p>Change the LED lead D13 to D9.</p> <p>LED fades.</p> <p>Try changing the fadeout = value.</p> <p>Try changing the delay(30) value.</p>
3	 <p>Push Button Switch</p> <p>Gnd D13 +5V D2 10K Gnd</p> <p>File > Examples > 02. Digital > Button ></p>	<p>Change D13 Lead on LED, back to D13 & add switch.</p> <p>LED illuminates on pushing down the button switch, goes off when released.</p>
4	 <p>Gnd D13 +5V D2 10K Gnd</p> <p>File > Examples > 02. Digital > Debounce ></p>	<p>Each time you push the button switch, the LED goes from on to off, off to on.</p>
5	 <p>Gnd D13 +5V D2 10K Gnd</p> <p>File > Examples > 02. Digital > DigitalInputPullUp ></p>	<p>Go to Tools> Serial Monitor and a serial monitor appears on the screen with 0's. Push the button switch and hold and get all 1's—LED off. Release 0's, LED on. LED Off on pushing, On on release.</p>
6	 <p>Gnd D13 +5V D2 10K Gnd</p> <p>File > Examples > 02. Digital > StateChangeDetection ></p>	<p>Go to Tools > Serial Monitor and a serial monitor appears on the screen and displays the number of pushes on the screen. One push turns off LED, another 3 pushes turns the LED back on.</p>
7	 <p>Piezo Sounder</p> <p>Gnd D9 to D8</p> <p>File > Examples > 02. Digital > Tone Melody ></p>	<p>Put D9 marked lead on Piezo into D8 for this sketch & remove switch.</p> <p>The Tone plays once only. Push the small red reset button on the Uno, to play again.</p>
8	 <p>Light Dependent Resistor (LDR)</p> <p>Gnd D9 +5V A0 4.7K Gnd</p> <p>File > Examples > 02. Digital > TonePitchFollower ></p>	<p>Put D9 lead on Piezo back into D9 & add LDR.</p> <p>Plays a Pitch Tone that changes with light input to the LDR (Light Dependent Resistor).</p> <p>Wave your hand over the LDR to change the Pitch.</p>
9	 <p>Potentiometer</p> <p>Gnd 2 3 4 5 6 7 8 9 10 11 +5V A0 Gnd</p> <p>File > Examples > 07. Display > BarGraph > (10 LED's)</p>	<p>Turning the Potentiometer back and forth, has the LED's acting like a Bar Graph, going up and down.</p>
10	 <p>Gnd 2 3 4 5 6 7 8 9 10 11 12 13 A1 A2 A3 A4 A5 +5V A0 Gnd</p> <p>File > Examples > 07. Display > BarGraph > (17 LED's)</p>	<p>Challenge- Like with the 10 LED Bar above, the 17 LED Bar does the same by turning the Potentiometer back and forth, with the LED's going up and down the Bar Graph. Use the same Sketch as above, but change the number of ledcount from 10 to 17, and add 12, 13, A1, A2, A3, A4, A5 to the ledpins array. Ensure..A4,A5;</p>

Pat's Plug & Code - Using "Examples" from the Arduino IDE.

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Note—As these "examples" are from the Public Domain, some use different pins. Attach as per the diagrams below and in the Sketches notes. Also use the links in the Sketches to get detailed information and diagrams. **Study each Sketch to Learn!**

No	On the Arduino IDE, go to the following, maximise screen and Upload. 	What Happens!
11	 <p>Piezo Sounder Gnd D9</p> <p>Potentiometer +5V A0 Gnd</p> <p>File > Examples > 02. Digital > TonePitchFollower > </p>	<p>Turning the Potentiometer back & forth, changes the Pitch Tone.</p> <p>Sounds like a Metal Detector finding Gold!</p>
12	 <p>HC-SR04</p> <p>+5V D7 Gnd</p> <p>Note- The Yellow Trig wire is needed but doesn't need connecting.</p> <p>File > Examples > 06.Sensors > Ping > </p>	<p>Go to Tools > Serial Monitor.</p> <p>Moving an object on a tape measure will give the distance out in Inch & Cm, on the Serial Monitor.</p> <p>Note— The black mesh front of the sensor is 0 Cm.</p>
13	 <p>Push Button Switch</p> <p>+5V D2 Gnd</p> <p>10K</p> <p>File > Examples > 01.Basics > DigitalReadSerial > </p>	<p>Go to Tools > Serial Monitor.</p> <p>0's will appear on the monitor when not pushed and 1's when pushed.</p>
14	 <p>Potentiometer</p> <p>+5V A0 Gnd</p> <p>File > Examples > 01.Basics > AnalogReadSerial > </p>	<p>Go to Tools > Serial Monitor.</p> <p>Turning the Potentiometer will give Analog values between 0 and 1023.</p>
15	 <p>Potentiometer</p> <p>+5V A0 Gnd</p> <p>File > Examples > 01.Basics > ReadAnalogVoltage > </p>	<p>Go to Tools > Serial Monitor.</p> <p>Turning the Potentiometer will give Analog Voltage values between 0.00 and 5.00 V.</p>
16	 <p>Potentiometer</p> <p>+5V A0 Gnd</p> <p>File > Examples > 01.Basics > ReadAnalogVoltage > </p>	<p>Go to Tools > Serial Plotter.</p> <p>Turning the Potentiometer shows a Graph of Voltage versus Time. See if you can replicate a Sine wave.</p>
17	 <p>3 Piezo Sounders</p> <p>Gnd D9 to D6 Gnd D9 to D7 Gnd D9 to D8</p> <p>File > Examples > 02.Digital > DigitaltoneMultiple > </p>	<p>Connect all 3 Piezo Sounders to Gnd and the other leads to D6,D7,D8.</p> <p>You will hear multiple Tones out of each Piezo at the same time.</p>
18	 <p>Piezo Sounder Gnd D9</p> <p>Potentiometer +5V A0 Gnd</p> <p>File > Examples > 03.Analog > Calibration > </p>	<p>Turning the Potentiometer will vary the Piezo Sounder Tone volume.</p>
19	 <p>Gnd</p> <p>2 3 4 5 6 7 8 9 10 11</p> <p>File > Examples > 03.Analog > AnalogWriteMega > (10 LED's) </p>	<p>The LED's will Fade up & down in turn.</p> <p>This Sketch was written to Fade 12 LED's so there will be a short pause in between runs.</p>
20	 <p>Gnd</p> <p>2 3 4 5 6 7 8 9 10 11 12 13 A0 A1 A2 A3 A4</p> <p>File > Examples > 03.Analog > AnalogWriteMega > (17 LED's) </p>	<p>Challenge- Like with the 10 LED Bar above, the 17 LED Bar does the same but you will need to alter the number in the Sketch of highestPin from 13 to 19, for the 17 LED Light Bar. The LED's start at D2 and go to A4 (17LED's).</p> <p>Try changing the delay() values and see what happens.</p>