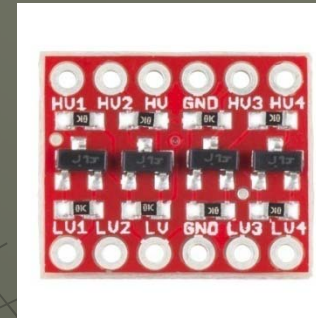


Basics - must-haves



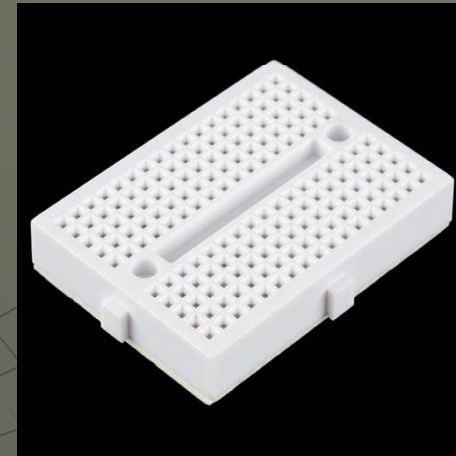
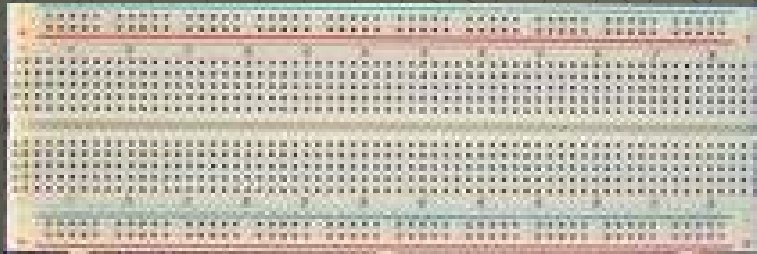
-Arduino Uno R3 (~\$25) – this is the “brains” of your payload

- Amazon: <http://www.amazon.com/Arduino-UNO-board-DIP-ATmega328P/dp/B006H06TVG>
- Sparkfun: <https://www.sparkfun.com/products/11021>
- MP3Car: http://store.mp3car.com/Genuine_Arduino_Uno_R3_DIP_p/opn-013.htm

-Bidirectional Level Shifter (~\$2) – needed to connect the 5V Uno to 3.3V sensors

- Sparkfun: <https://www.sparkfun.com/products/12009>

Basics - must-haves



- Large Solderless Breadboard (~\$8)– build your circuits on this

-Amazon: http://www.amazon.com/BB830-Solderless-Plug-BreadBoard-16-points/dp/B0040Z4ON8/ref=sr_1_5?rps=1

-Sparkfun: <https://www.sparkfun.com/products/12615>

-Small Solderless Breadboard (~\$3 ea) – build your small circuits on this board

- Amazon: http://www.amazon.com/SYB-170-Color-Board-Small-Bread/dp/B00ARUF2JM/ref=sr_1_1

- Sparkfun: <https://www.sparkfun.com/products/12043>



Basics - must-haves



- Male to Male jumper wires (~\$5/75 pcs) – to wire your circuits

-Amazon: http://www.amazon.com/Wosang-Solderless-Flexible-Breadboard-Jumper/dp/B005TZJOAM/ref=sr_1_1

-Male to Female jumper wires (~\$5/40 pcs) – to wire your circuits

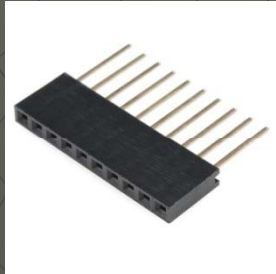
- Amazon: http://www.amazon.com/Phantom-YoYo-dupont-cable-female/dp/B00A6SOGC4/ref=sr_1_5

- Female to Female jumper wires (~\$9/100 pcs) – to wire your circuits

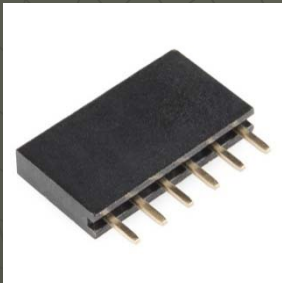
- Amazon: http://www.amazon.com/sunkee-100pcs-female-jumper-Arduino/dp/B00AYCON8Y/ref=sr_1_3



Basics – should have



- Stackable headers (many shields come without)
- Sparkfun 6 pin: (~\$0.50 ea): <https://www.sparkfun.com/products/9280>
- Sparkfun 8 pin: (~\$0.50 ea): <https://www.sparkfun.com/products/9279>
- Sparkfun 10 pin: (~\$0.50 ea): <https://www.sparkfun.com/products/11376>



- Non-stackable headers (some shields need these)
- Sparkfun 6 pin (~\$0.50 ea): <https://www.sparkfun.com/products/11894>
- Sparkfun 8 pin (~\$0.50 ea): <https://www.sparkfun.com/products/11895>
- Sparkfun 10 pin (~\$0.50 ea): <https://www.sparkfun.com/products/11376>



- Breakaway 0.1" straight headers (~\$2/40 pins)
- Sparkfun: <https://www.sparkfun.com/products/116>



- Breakaway 0.1" right angle headers (~\$2/40 pins)
- Sparkfun: <https://www.sparkfun.com/products/553>



Basics – should haves



Wall Power Supply 9VDC (~\$6 - when not connected via USB)

Sparkfun: <https://www.sparkfun.com/products/298>



9VDC adapter and battery holder to power Arduino (~\$3)

Sparkfun: <https://www.sparkfun.com/products/10512>



9VDC adapter to power Arduino (~\$2.00)

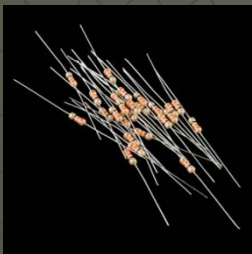
Amazon: <http://www.amazon.com/gp/product/B005D65LEG>



Helpful for learning



- LEDs (~\$0.50 ea) – early Arduino exercises
- Sparkfun: <https://www.sparkfun.com/products/10632>



- Resistors (~\$1/20 pcs) – current limiting in circuits
- Sparkfun 330 ohm: <https://www.sparkfun.com/products/11507>
- Sparkfun 10K ohm: <https://www.sparkfun.com/products/11508>



- Potentiometer (~\$1 ea) – early Arduino exercises
- Sparkfun 10K ohm: <https://www.sparkfun.com/products/9939>



- Pushbutton (~\$0.50 ea) – on/off digital input
- Sparkfun 0.25" square: <https://www.sparkfun.com/products/97>
- Sparkfun 0.5" square: <https://www.sparkfun.com/products/9190>



Useful Tools



- Multimeter (~\$7) – measure voltages

- Amazon:

http://www.amazon.com/D18308-Digital-Voltmeter-Ammeter-Multimeter/dp/B005KGC10Y/ref=sr_1_7



- Wire Strippers (~\$12) – remove insulation from wires before connecting

- Amazon:

- http://www.amazon.com/Klein-11046-Stripper-Cutter-Inches/dp/B0000302WS/ref=sr_1_8



- Needle nose pliers (~\$2) – secure and bend wires/parts

- Sparkfun: <https://www.sparkfun.com/products/8793>



- Diagonal Cutters (~\$2) – cut wires to length

- Sparkfun: <https://www.sparkfun.com/products/8794>



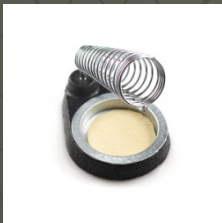
Useful Tools



- Soldering Iron (~\$10) – soldering (replaceable element & tip)
- Sparkfun - iron: <https://www.sparkfun.com/products/9507>

Replacment parts (not needed now):

- Sparkfun – tip: <https://www.sparkfun.com/products/9537>
- Sparkfun – heating element: <https://www.sparkfun.com/products/9509>



- Stand for Soldering Iron (~\$6) – needed for safety when using iron
- Sparkfun: <https://www.sparkfun.com/products/9477>



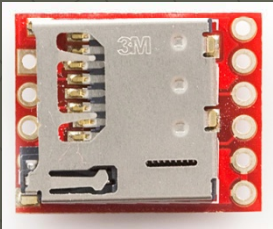
- Solder (~\$6/100g) – use with soldering iron
- Sparkfun: <https://www.sparkfun.com/products/9161>



- Solder wick (~\$3/5ft) – use to remove solder
- Sparkfun: <https://www.sparkfun.com/products/9327>



Possible Sensors & Boards



Datalogger (~\$25) record data to SD Card
Also used on S4

Sparkfun: <https://www.sparkfun.com/products/9530>



3 Axis Accelerometer & Gyro (~\$40)

Sparkfun: <https://www.sparkfun.com/products/11028>



3 Axis Accelerometer (~\$18)

Also used on S4

Sparkfun: <https://www.sparkfun.com/products/9836>



Possible Sensors & Boards



3 Axis Magnetometer (~\$15)

Also used on S4

Sparkfun: <https://www.sparkfun.com/products/10530>



Barometric Pressure (~\$10)

Also used on S4

Sparkfun: <https://www.sparkfun.com/products/11824>

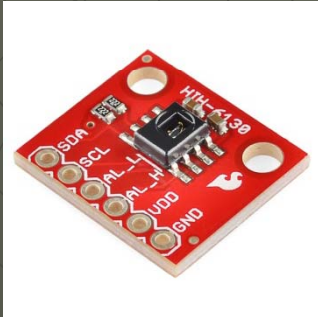


Altimeter Module (~\$30) similar to PerfectFlite P-Nut

Parallax: <http://www.parallax.com/product/29124>



Possible Sensors & Boards



Humidity and Temperature Sensor (~\$30)

Also used on S4

Sparkfun: <https://www.sparkfun.com/products/11295>



GPS Receiver EM-506 (~\$40)

Sparkfun: <https://www.sparkfun.com/products/12751>



GPS Receiver Gp-635T (~\$40)

Also used on S4

Sparkfun: <https://www.sparkfun.com/products/11571>