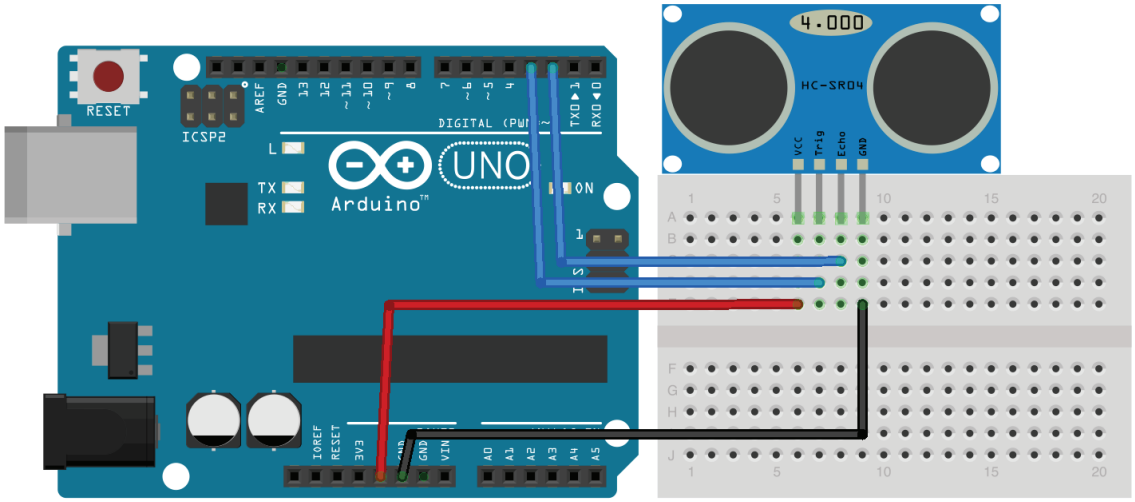
5 Ultrasonic Sensors

Basic Information

An **Ultrasonic Distance Sensor** is a cheap and easy way to work out how far away an object is from your **Arduino** with a range of up to 2m to within an accuracy of a few cm. **Ultrasonic distance sensors** use a similar technology to **sonar** on ships and submarines. It simply involves a "blip" of high-pitched sound being sent out from the sensor. The sensor then waits for the "blip" to return and informs the **Arduino**. With some simple maths, this can then easily work out how far away an object is.
The sensor uses 4 pins, **5v** for power, **GND** for ground. **Trig** is the pin that triggers the pulse out of **ultrasound**. **Echo** is connected to the reciever on the sensor that listens for the **ultrasound** as it returns after bounching off an object.

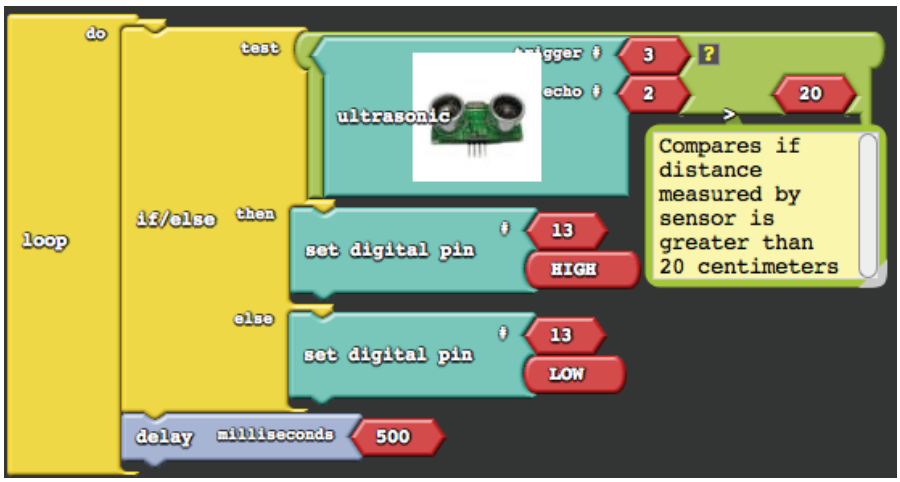
HC-SR04 Ultrasonic Distance Sensor



Tip

Ultrasonic distance sensors work best with.....

- **Flat objects** (heads or curved objects wont work well)
- **Close objects**



Measuring distance

The code to the left checks the **ultrasonic distance sensor** connected to pin 2 and 3 to see if its returned distance (how far away the nearest object in front of it is). It measures this in centimeters. It then checks if the distance is greater than 20cm, if it is, turns on the built in **LED** on pin 13. If it is less than 20 it turns the **LED** off.

Now try

1. If an object is within 10cm of the sensor, turn on the built in **LED**
2. Use "**serial println**" to tell you the exact distance via the **serial console**
3. Using an **RGB LED**, have the **LED** change colour depending on distance from the sensor