Supplies needed if intending to complete in **one lab period**:

|  |  |
| --- | --- |
| Per student group | * Laptop with Arduino IDE and libraries (downloaded from the internet) and Excel (student laptops) * Arduino kit   + Arduino board   + Mini breadboard   + Arduino/Breadboard holder   + USB connector   + Waterproof temperature sensor (DS18B20) with one male jumper wires connected to each of the three wires   + 4.7k ohm pull-up resistor   + 2 male-male jumper wires   + 1 male-female jumper wires * Styrofoam cup (to make calibration ice bath) * Stop watch (to measure response times) * 500 ml graduated cylinder (to make two-layer system) * 2 400 ml beakers (for response time/making of two-layer system) * Stir rod (to mix ice baths) * Small sponge (to make two-layer system) * Meter stick (to measure sensor depth in two-layer system) |
| Per lab | * Boiling water bath * Microwave * Cold water (tapwater is fine) * Ice (to make calibration/response time ice baths) * Food coloring (for two-layer system) |

Supplies broken down by section if activity is completed over **multiple lab periods**:

|  |  |
| --- | --- |
| Per student group | * Laptop with Arduino IDE and libraries (downloaded from the internet) and Excel (student laptops) * Arduino kit   + Arduino board   + Mini breadboard   + Arduino/Breadboard holder   + USB connector   + Waterproof temperature sensor (DS18B20) with one male jumper wires connected to each of the three wires   + 4.7k ohm pull-up resistor   + 2 male-male jumper wires   + 1 male-female jumper wires * Calibration   + Ice   + Chilled water   + Styrofoam cups   + Stir rod * Response time   + 2 250 ml beakers   + Microwave   + Ice   + Chilled water   + Stop watch * Taking data   + 500 ml graduated cylinder   + 2 250 ml beakers   + Food coloring   + Stir rod   + Meter stick   + Small sponge |