# Device Replication and Instructions

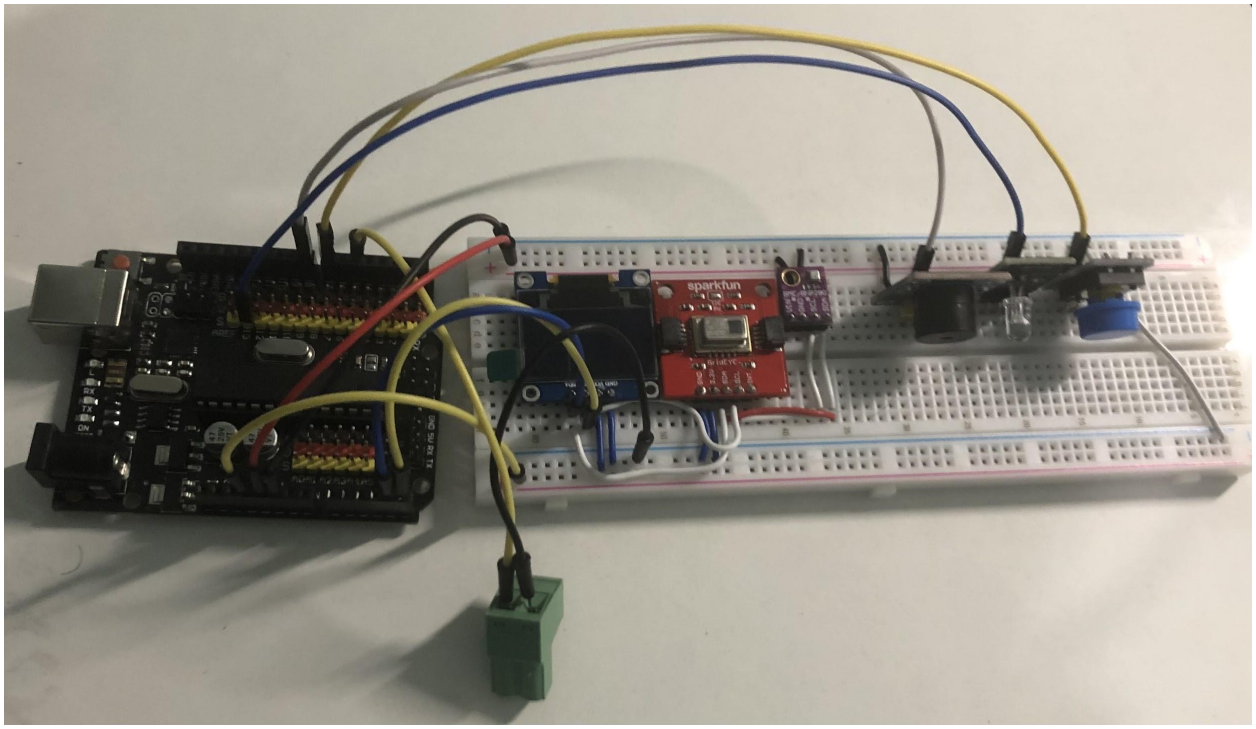


*Figure 9:* Complete Kitchen Kare Device with all components

## Materials

- 1 Arduino Uno
- 1 Breadboard
- 1 Digital Screen - OLED I2C SSD1306 display module
- 1 Human Sensor - Sparkfun Grid-Eye Infrared Sensor
- 1 Temperature Sensor - Adafruit *BME280* Humidity + Barometric Pressure + Temperature Sensor
- 1 Wall Plug - Controllable Four Outlet Power Relay Module version 2 - (Power Switch Tail Alternative)
- 1 Arduino Buzzer
- 1 LED light
- 1 Arduino Button
- Male-to-male connectors
- Male-to-female connectors
- Female-to-female connectors

# Building Instructions

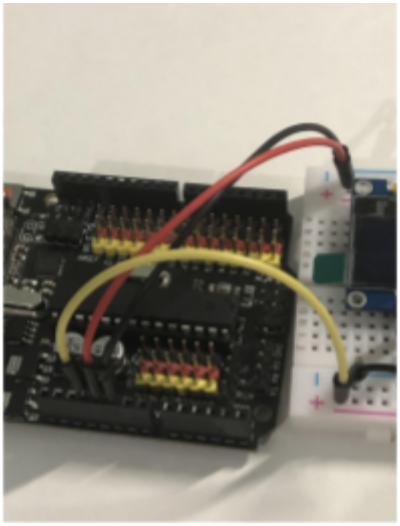

*Figure 10:* Connecting wires from OLED to Arduino

## Setting up Currents

1. Position the Arduino Uno with its ports facing out towards the left and the breadboard to its right horizontally.
2. The top of the breadboard supports sensors and components that handle 5V while the bottom handles 3.3V. To set this up, gather 1 red, 1 yellow, and 2 black male-to-male wires.
    a. On the bottom side of the Arduino, take a black wire and connect it from GND (ground) on the Arduino to the negative (-) row on the top of the breadboard in the first slot from the left.
    b. Again, on the bottom side of the Arduino, take a red wire and connect it from the 5V slot (this slot should be one left from the previous GND or ground slot) on the Arduino to the positive (+) row on the top of the breadboard in the first slot from the left.
    c. Again, on the bottom side of the Arduino, take a yellow wire and connect it from the 3.3V slot (this slot should be one left from the previous 5V slot) on the Arduino to the positive (+) row on the bottom of the breadboard in the first slot from the left.
    d. Use a long white wire to connect the two negative (-) rows on the breadboard.

## Integrating the Digital Screen - OLED

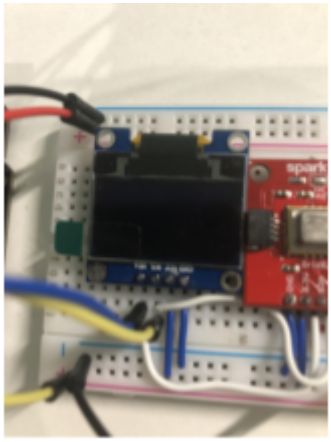

*Figure 11:* Integrating OLED

1. Place the 4 pins of this Screen in g54-57, with the screen above the pins directly into the breadboard.
2. On the bottom side of the Arduino, take a blue male-to-male wire and connect it from A4 on the Arduino to i57.
3. On the bottom side of the Arduino, take a yellow male-to-male wire and connect it from A5 on the Arduino to j56.
4. Connect two smaller wires from i55 to the positive (+) row on the bottom of the breadboard and i54 to the negative (-) row on the bottom of the breadboard.

## Integrating the Human Sensor - Sparkfun

1. Place the 5 pins of this Human Sensor in h43-47, with the screen above the pins directly into the breadboard.
2. Connect two smaller wires from i46 to the positive (+) row on the bottom of the breadboard and i47 to the negative (-) row on the bottom of the breadboard.
3. Connect white wires from i56 to i44 and j57 to i45.
4. Connect a red and a white wire from j45 to j36 and from j44 to j37.

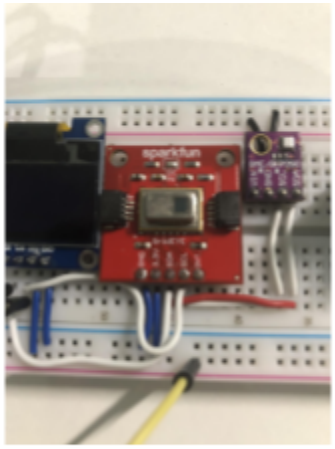

*Figure 12:* Integrating Infrared Sensor

## Integrating the Temperature Sensor - BME280

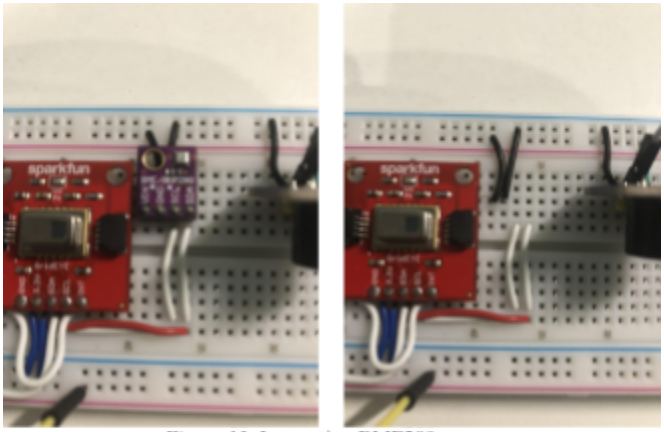

*Figure 13:* Integrating BME280 sensor

1. Connect white wires from i36 and i37 to e36 and e37.
2. Connect small black wires from the top part of the breadboard from the positive (+) and negative (-) rows to c39 and c38.
3. Place the pins of the temperature sensor - BME280 directly into the breadboard so the pins SCL and SDA align with these black and white wires.

## Integrating the Arduino Buzzer

1. Connect 1 small black and 1 green wire from the top part of the breadboard from the positive (+) and negative (-) rows to b27 and b29.
2. From the top of the Arduino, connect a white wire from pin 8 to b28.
3. Add Arduino Buzzer in c27-29.

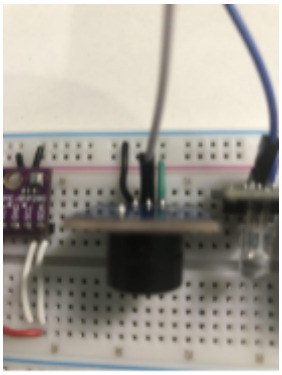

*Figure 14:* Integrating buzzer

## Integrating the Arduino LED light

1. Connect a small blue wire from the top part of the breadboard from the negative (-) row to a19.
2. From the top of the Arduino, connect a blue wire from pin 13 to a20.
3. Add Arduino LED Light in b19-22.

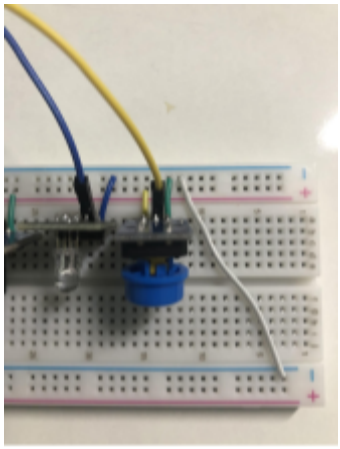

*Figure 15:* Integrating LED light and button

## Integrating the Arduino Button

1. Connect 1 small yellow and 1 green wire from the top part of the breadboard from the positive (+) and negative (-) rows to a15 and a13.
2. From the top of the Arduino, connect a yellow wire from pin 7 to a14.
3. Add Arduino Button in b13-15.

## Integrating the Wall Plug

1. Connect 1 long yellow and 1 long black wire from pin 5 to the right hole of the green connector and ground (GND) to its left hole.
    a. In order to connect the wires to the green connector portion of the wall plug, unscrew the tops then clamp them when inserted.

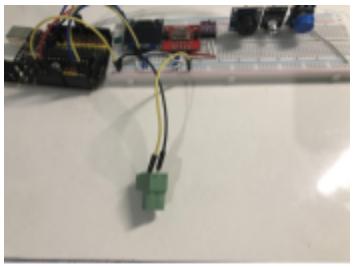

*Figure 16:* Integrating wall plug

# Different Kitchen Kare Models

## Kitchen Kare Heat

1. Remove the Wall Plug.
2. Remove only the Infrared Sensor or Human Sensor (Sparkfun).

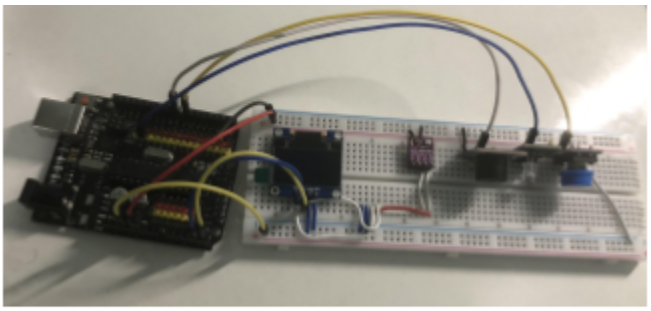

*Figure 17:* Kitchen Kare Heat

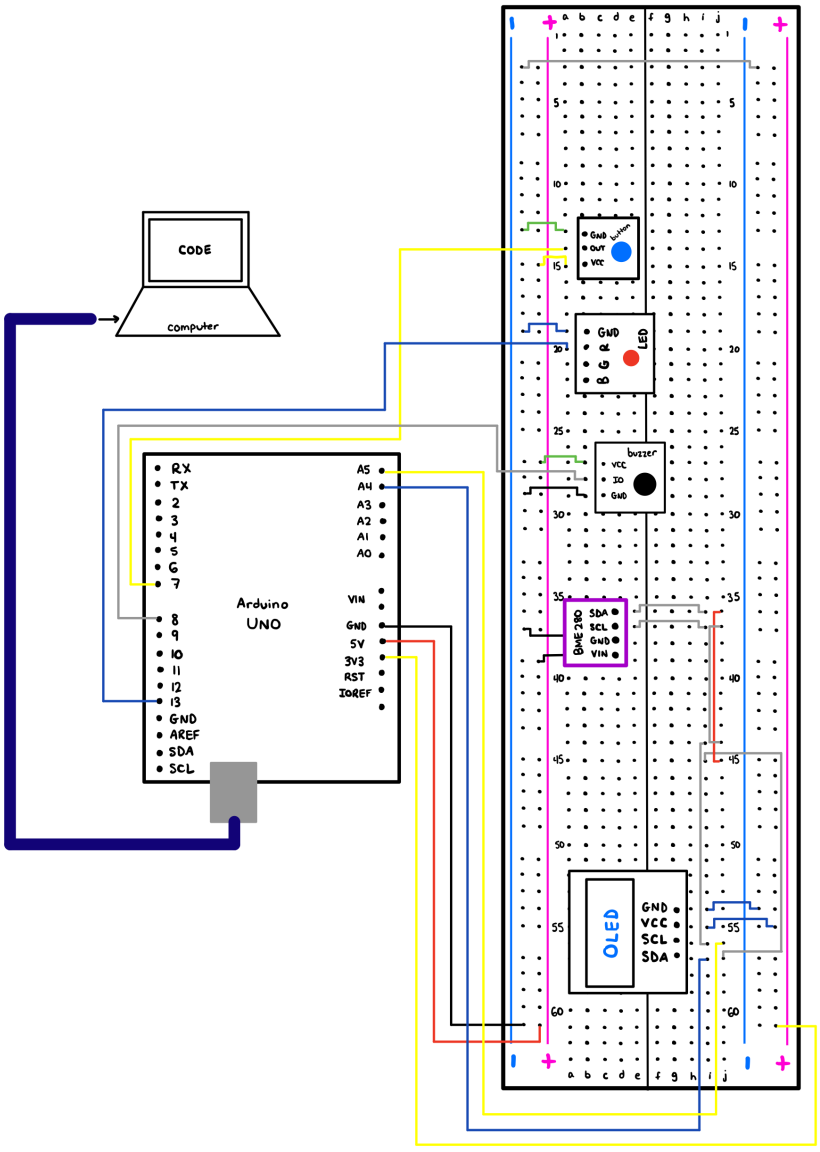


*Figure 18:* Drawing of Kitchen Kare Heat Arduino model

## Kitchen Kare Wall Plug

1. Remove the Infrared Sensor or Human Sensor (Sparkfun).

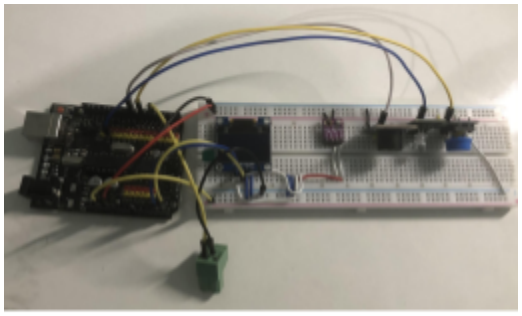

*Figure 19:* Kitchen Kare Wall Plug

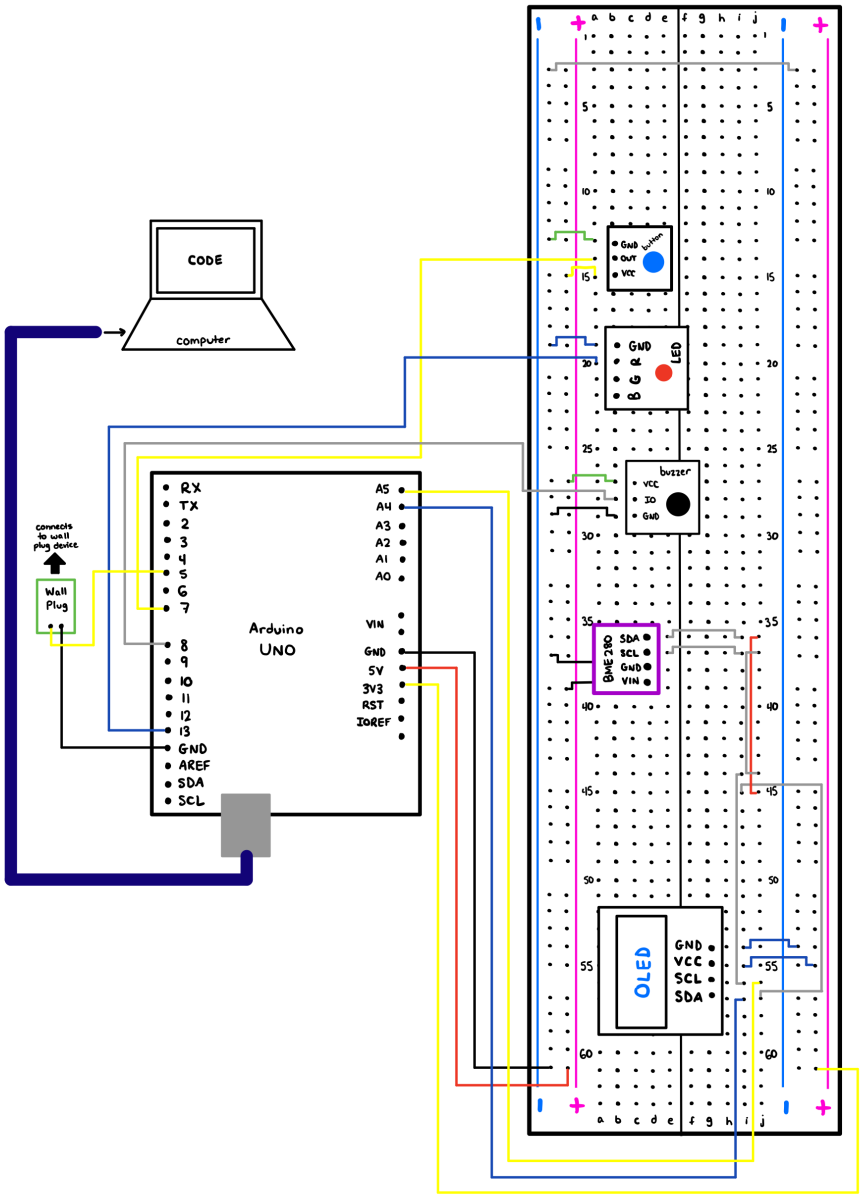


*Figure 20:* Drawing of Kitchen Kare Wall Plug Arduino model

## Kitchen Kare Motion

1. Do not make any changes to the base model, this is Kitchen Kare Motion.

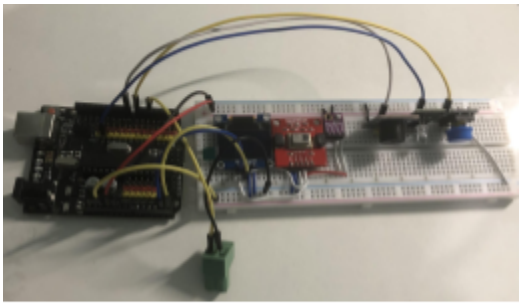

*Figure 21:* Kitchen Kare Motion

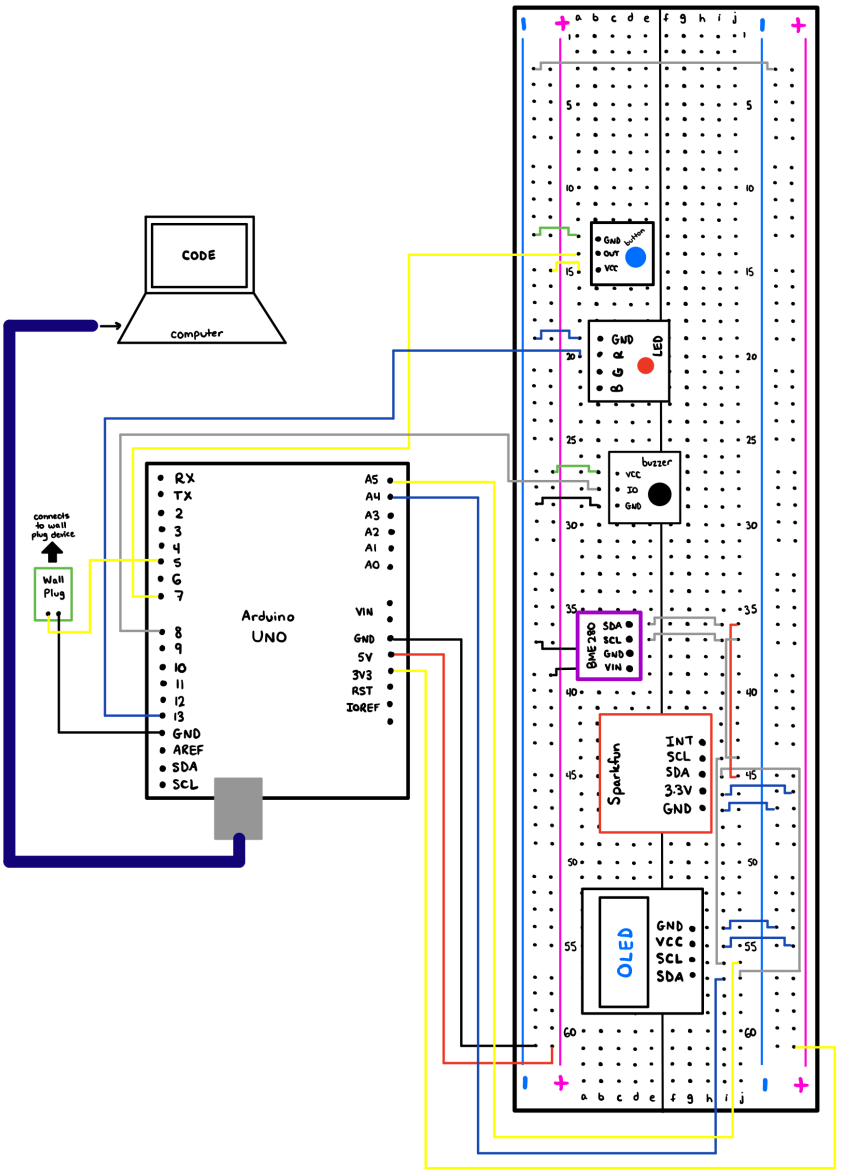


*Figure 22:* Drawing of Kitchen Kare Motion Arduino model

## Connecting the Computer

1. Install the Arduino IDE from the official website found here.
2. Use a connecting wire like shown (same ports) in order to upload code. If other ports are used, the code will not upload.
3. Visit the final products folder in the GitHub repository and download the corresponding code by navigating to the correct file and clicking the green download button and then running with the IDE.

## Running Code

1. Open up the Arduino IDE.
2. Connect the Arduino Uno
    a. Go to Tools > Port > COM X (Arduino Uno)
        i. X may be any integer
3. Connect the Arduino via the Wire.
4. Click the right arrow in the top left to compile and run.
    a. Because this code will be saved locally until overwritten, next time any power source (i.e. Battery) can suffice as well.


*Figure 23:* Click on the arrow circled in red to compile and run the code.