



## Components and Assembly

### Spring 2020 Class 6

#### Goals:

- Identify all the components for air quality sensors
- Map out the flow of power and data between components
- Assembly Components
- Test saving and retrieving data

#### Materials

- 3 Sensor Sets
- 4 tables
- 12 chairs
- One folder per group
- Flow Chart Arrow Sheet
- Sensor Log Sheet
- Schematic Drawing
- Markers and pens
- Scissors
- Glue Sticks
- 3 laptops (windows)

#### Room Set Up

1. Set up 4 large tables with 3 seats each
2. put 1 sensor set on each table
3. put jar of pens and scrap paper on each table
4. Print out Flow Chart Arrow Sheet, Sensor Log and place them in a folder. One for each table (3 sets)
5. Cut Out Arrows and Parts List Sheet
6. Bring in White Board
7. Set up snacks on 4th table
8. Write Plan for the Day on White Board
9. Draw flow on opposite side of the board
10. Assemble a model to compare
11. Test getting the data off with 2 interns and making an excel graph



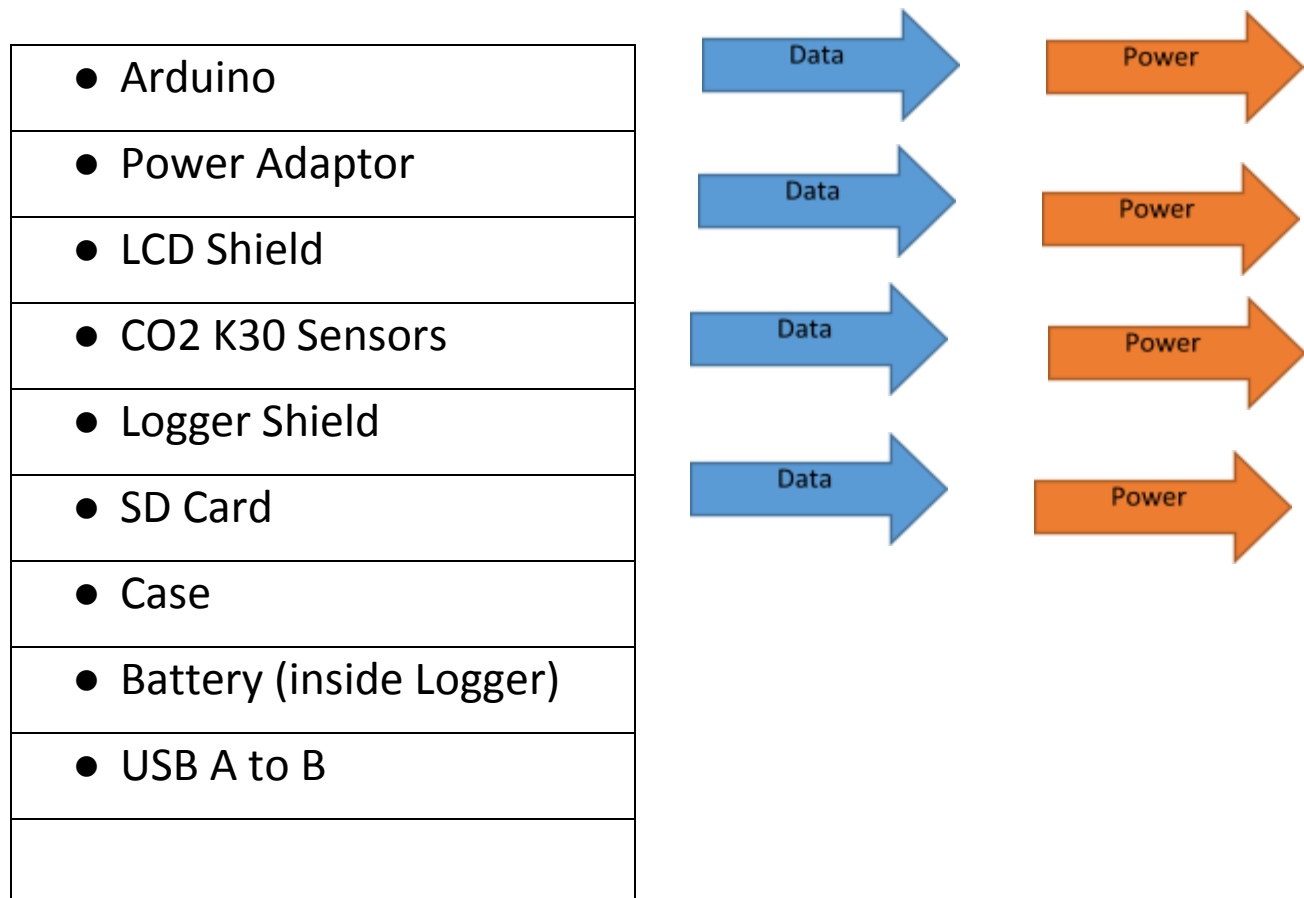
## 12. Make sure laptops are ready to go

### Class Flow

1. **3:00pm:** Welcome students to have snacks
2. **3:10pm:** Plan for the day
3. **3:15pm:** Assign some group roles, re-introduce yourself, say what you're interested in studying or doing in your career
  - a. TimeKeeper - Make sure we're working at a good pace
  - b. Project Manager - Make sure you are staying on task and moving towards the goal
  - c. Community Manager - Make sure everyone is participating
4. **3:30pm:** Instruct students to open their boxes and have a look at the materials
  - a. Label and identify all the parts with the **cut-out labels** (5 min)
  - b. Each person choose 3 components to research (20min)
    - i. Write the answers on the cut out labels
    - ii. What types of information should we find out? (write on the board)
      1. Look at the component and see what kind of serial numbers or name it has on it
      2. What it's used for?
      3. What it needs to run
      4. What other tools it works with/compatibility
      5. The size
    - iii. What did we find out about each component? (5 min)
      1. Go through the list and have the specialist read out
        - a. Other specialists add information
        - b. Ricardo adds information
      2. Anyone find out what K30 or Shield means?
  - c. **4:00pm:** So all these parts together will communicate with each other. Using the **arrow labels**, map out how you think these components are going to be used to communicate with each other (15min)
    - i. We'll go around and look at each group and give feedback
    - ii. We'll show the actual flow
  - d. Give out **schematic Drawing**. Now, start to arrange your parts based on this schematic (15min)
    - i. We'll show them how the shields fit together
    - ii. Ricardo and Interns check with model
5. **4:30pm:** Testing and debugging
  - a. Pass out **Debugging log** and explain how it will work

- b. For teams who don't get any read out
  - i. Ricardo will debug
- c. For teams that are getting read out
  - i. do the readings make sense? (what should they say?)
  - ii. take the data off using a computer
  - iii. open in excel and make a graph
- 6. Closing Discussion
  - a. What are your ideas for these sensors?
  - b. How can they be used?
  - c. What are some of the limitations?
  - d. How do we track variables during experiments? (observe other conditions that might affect the data)
  - e. Can you teach your fellow students how to use it?

To Cut Out:





## Data Sheet Worksheet

- **Arduino Uno**
- **Triad Power Adaptor**
- **LCD Shield**
- **CO2 K30 Sensors**
- **Logger Shield**



- **SD Card**

- **Case**

- **Battery**

- **USB A to B**

[illegible]



## Schematic

