Challenge Summary: The AEP challenge is to build a small display device to indicate utility usage, abnormal conditions and/or environmental conditions in the home. The idea is that the device would provide information that is in-between our home monthly efficiency reports and the detailed information from our SmartMeters/Phone App. The device can use displays to generate readouts and/or colors or patterns to indicate to the user how things are behaving and alert them to the fact that they may want to use the phone app, etc., to look deeper into a situation.

The students can take the idea any direction they want and use some or all of the ideas or add their own.

Build: This can be built using an Arduino, RASPI, etc., also, some of the displays have built in processors that can do other stuff. The utility signals are to be simulated with potentiometers or other manual inputs.

Display Ideas: LEDs, LCD, or small OLED screen, (if RASPI, a monitor can be used as the output).
Environmental Sensors: Humidity, Temperature and air quality.

Suggested Parts

I added links to sparkfun for some of the parts, adafruit also has a similar selection. This is one of the sites I use for my projects, but there are many others. This is a suggestion only.

1) Assorted LEDs of different colors
2) Servos: if they want to build something that moves to signal a condition.

3) Displays: Qty: 4 or 5 of one of the types is sufficient.
Here are some display ideas. Many of these use separate configuration software. Not sure of the level of experience the students will have. Many of these need a USB/UART

interface cable, you may already have these. (Below are some options, 2-3 of one type is all that is needed)

a) 2.4" LCD-TFT Display https://www.sparkfun.com/products/16014 ($30.95)   My first choice.
b) 2.7" LCD-TFT Display https://www.sparkfun.com/products/16009 ($34.95)
c) 1.7" OLED Display: https://www.sparkfun.com/products/16012: ($77.95)
d) Screen for use with a RASPI: https://www.sparkfun.com/products/15357 ($49.95)

4)   CCS811 Air Quality: Qty: 4 or 5: https://www.sparkfun.com/products/14193 ($20.95)
5)   Si8021 Humidity and Temperature: Qty: 4 or 5: https://www.sparkfun.com/products/13763 ($7.95)