Basic atmospheric measurements via Arduino Uno microcontroller with commercially available sensors towards simple real-time weather forecasting for increased classroom engagement[1] RYAN ECKEL, MEGHAN TANNER, INDRAJITH SENEVIRATHNE, Lock Haven University Department of Geology and Physics — Makers, engineers and the applied physics community have adapted Arduino microcontrollers due to their versatility, robustness and cost effectiveness. Arduino microcontroller environment coupled with commercially available sensors have been used to systematically measure, record and analyze temperature, humidity and barometric pressure for building a simplified weather station for subsequent educational purposes. This data will become available in classroom settings for real-time analysis towards simple weather forecasting. Setup was assembled via breadboard, wire and simple soldering with an Arduino Uno ATmega328P microcontroller connected to a PC. The microcontroller was programmed with Arduino Software while the bootloader was used to upload the code. Commercial DHT22 humidity and temperature sensor, and BMP180 barometric pressure sensor were used to obtain relative humidity, temperature and the barometric pressure. A weather resistant enclosure protected the system while stable real-time data measurements were obtained, and uploaded onto the PC. The data was used to predict atmospheric conditions and lifting condensation level (LCL). Discussion will focus on capabilities and limitations of these systems and corresponding teaching aspects.

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