Name: Date: Class:

Complete Code

```
/*This code is designed to interact with an Arduino board and a sound sensor.
The sound sensor will pick up on changes in noise levels around it and prints the
decibel value to the serial monitor.
Enjoy this fun and creative experiment!*/

//At the start of the code we establish the different variables and pin
connections used throughout our code

//Here we establish the envelope pin connection to the Arduino Uno board to pin
A0
#define ENVELOPE_PIN A0

//The variables i, j, and k are used as counters in our code.
//These are integer variables used for counting within loops.
int i;
int j = 0;
int k = 0;

//readadc and readdB are used to hold the working values of our adc output and
decibel level
int readadc;
float readdB;

//adcref and dBref are used as predetermined values used to callibrate and
calculate our sound level
int adcref = 147;
float dBref = 83;

//adcval is used as our final average value of our adc output
float adcval;

//dB is our final output in decibels
float dB;


//This section of code runs once at the beginning of the program, it sets up our
serial monitor to access our data
void setup() {
  Serial.begin(9600);
}


//This section, the 'void loop' continuously loops while the code is running
```

Name: **Date:** **Class:**

```
//Everytime the loop is run, one decibel value is calculated and printed
void loop() {

//This loop limits our data collection to 150 data points, or 30 seconds worth of
data
  if(k<150) {

//This resets our adcval back to zero at the beginning of every loop
    adcval = 0;

/*This for loop repeats 100 times, using the variable i as a counter to keep
track of this
In this loop we read the adc value from the envelope pin, that value is then
added into our adcval
The read adc value is added in order to calculate the average value of our
reading giving more accurate data*/
    for(i=0; i<100; i++) {
      readadc = analogRead(ENVELOPE_PIN);
      adcval += readadc;
      delay(2);
    }

//This is the final step of finding the average value, where we divide our sum to
get the average
    adcval = adcval/100;

//This is where the RMS value of the adc readings is converted into decibels of
sound pressure
    readdB = 20*log10(adcval/adcref);
    dB = dBref + readdB;

//Lastly we print the calculated decibel value
//The j counter is used in an if else statement in order to organize the data
into rows of 15 measurements
    if (j<14) {
      Serial.print(dB);
      Serial.print(", ");
      j += 1;
    }
    else {
      Serial.println(dB);
      j = 0;
    }
```

```
//Here we increment our k value to keep track of how many data points we have, in order to stop collecting data after 150 points
    k+=1;
  }

//Once 150 data points have been collected the message "Done." will be displayed and k will be increased stopping if statements from running
  if(k==150) {
    Serial.println("Done.");
    k+=1;
  }
}
```