Once your class has retrieved their agar model frogs from their microhabitats you will need to (I) open the frogs and retrieve the ibuttons, (II) offload the data from the ibuttons and record metadata for each ibutton, and (optionally) (III) plot the ibutton data in Excel. The following contains detailed instructions for each of these steps.

(I) Open the frogs and retrieve the ibuttons

1. Once back in the classroom and after taking final measurements, have your groups crack open their agar frogs and remove the ibutton temperature sensors. Make sure the students have recorded at least the last four letters/numbers of the unique code written on the bottom of their ibutton. The number should start with a bunch of zeros, followed by 36. After the 36 each ibutton code will be unique. For example, the student should record CBC3 for the ibutton pictured at right.

2. ONCE THE iBUTTON IS REMOVED, the agar frog body may be thrown away. If students wish to keep theirs they should be warned that the pigments can rub off and stain clothes.

(II) Offload the data from the ibuttons and onto the data downloader unit

1. Open the OneWireViewer program on the provided laptop and plug the USB end of the OneWire reader into the computer.

2. Touch the face of the ibutton with the writing on it to one of the ports on the back of the downloader and steadily hold it in contact. You don't need to "snap" it in place, as they can be difficult to remove.
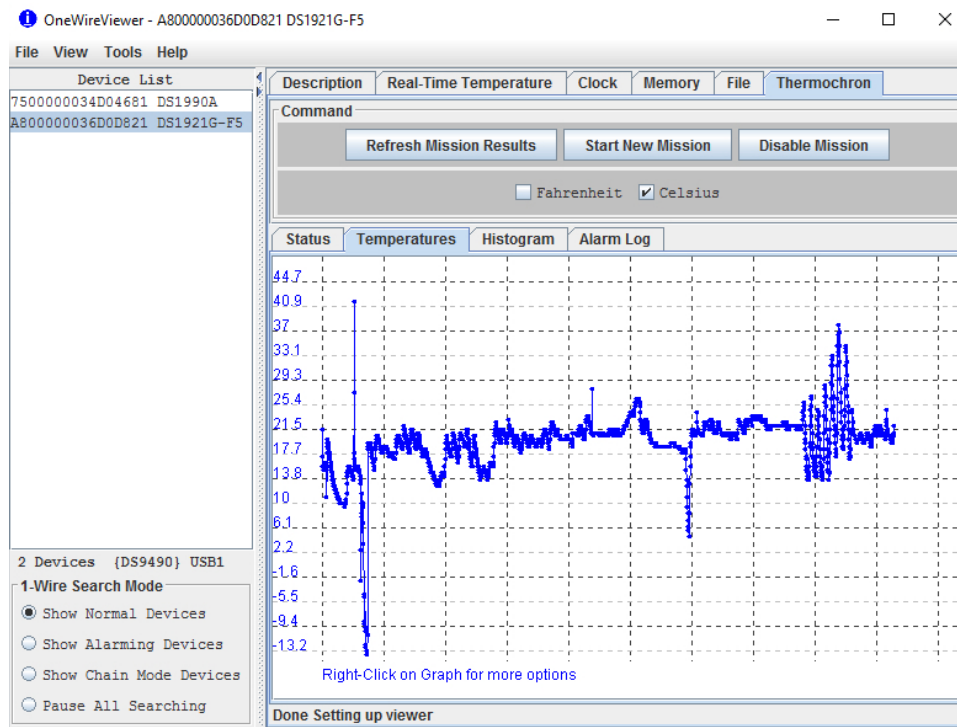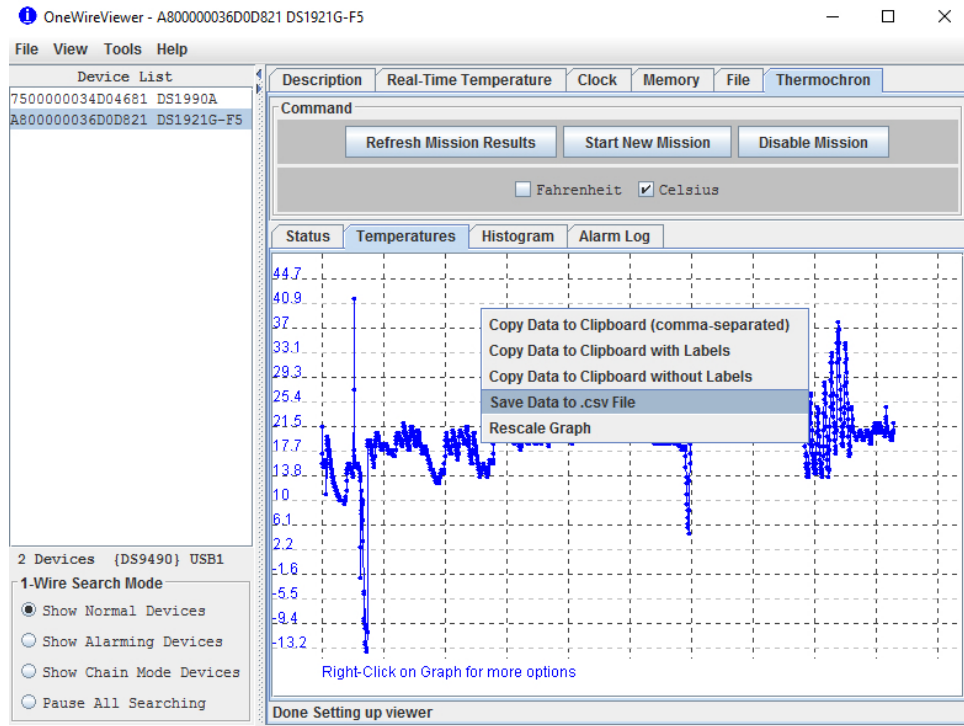
3. Select the ibutton ID from the "Device List" menu on the left.
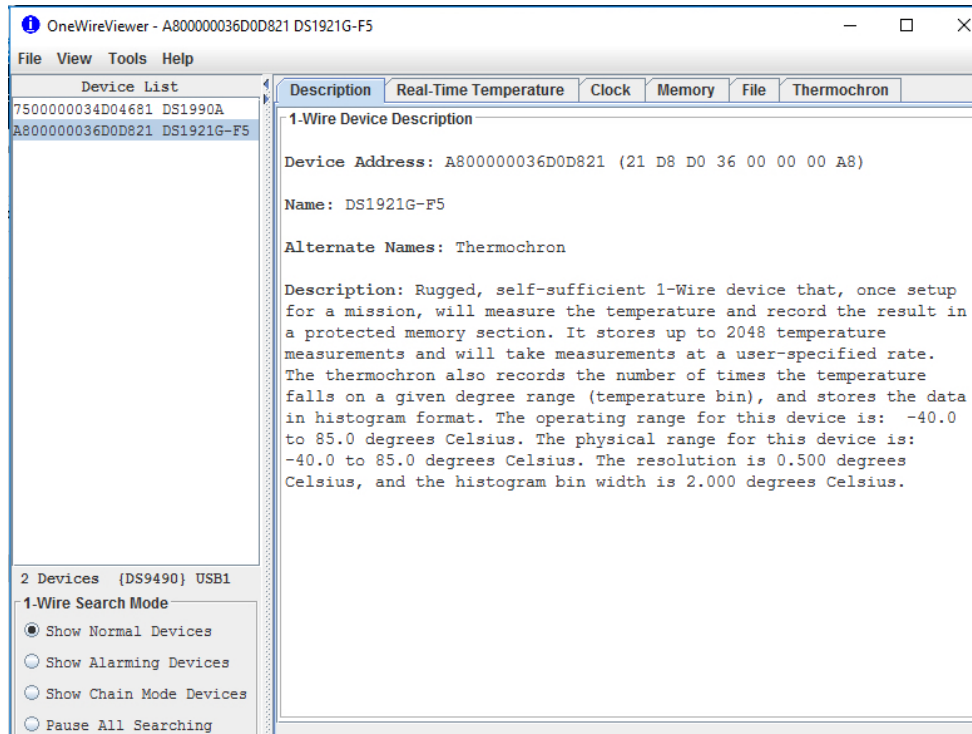
4. Click on the "Thermochron" tab on the right, then click the "Temperatures" tab to get a graph of the temperature readings.
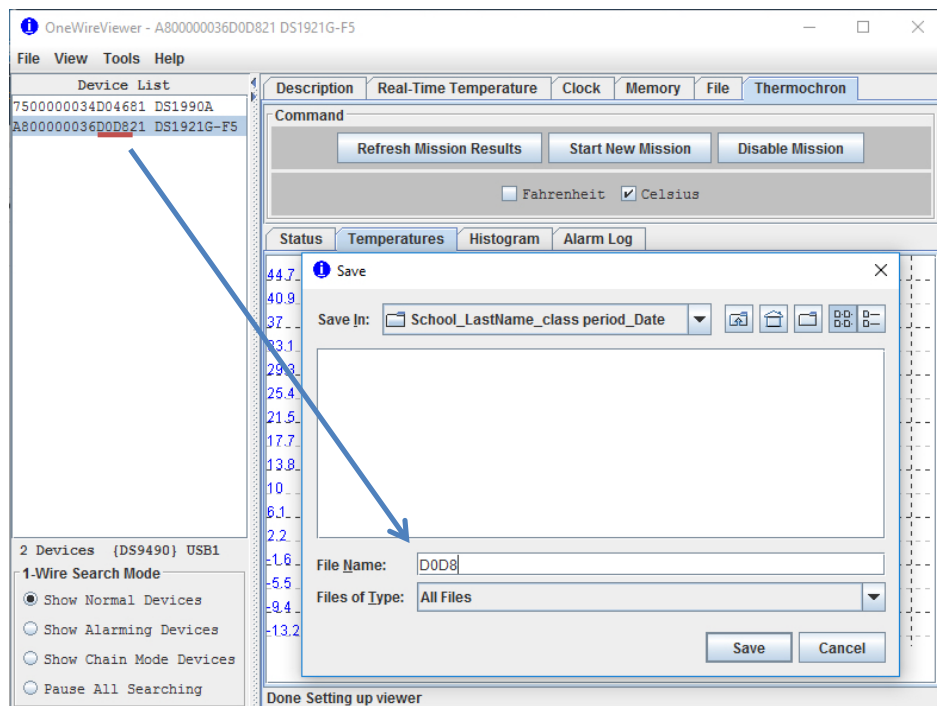
5. Right click anywhere on the graph, and select "Save Data to .csv file"

6. Create a folder on the desktop titled with your "School_LastName_ClassPeriod_Date." Name each ibutton file with the 4-digit ibutton ID. This can be found within the ibutton ID in the device list: it is the 4-character code after the …00036 and before the 21…

7. After downloading the data from an ibutton, be sure to record the ibutton code (e.g. CBC3, as pictured above), what microhabitat the model frog was in, beginning and end mass, as well as the time the model was deployed on the Ectotherm ER Teacher Metadata Spreadsheet. Pitt Bio Outreach and Dr. Zawacki will need to receive this information, in Excel format, in order to make use of the data your students collected.

8. Collect the ibutton from the student for return to Pitt Bio Outreach.

9. Repeat steps 1-6 until all ibutton data has been saved in the class folder and recorded on the metadata spreadsheet for the class period.


(IV) Plot the iButton Data in Excel (optional)

1. Open Microsoft Excel, then navigate to and open a .csv file containing one frog's data.

2. Under the heading data for the particular ibutton readout you will see three columns of data labelled **Date/Time**, **Unit** and **Value**. The rows beneath these columns contain your data. The unit is degrees Celsius (C) and the value is the temperature recorded by the ibutton at the particular date and time. Scroll down to the point where your student deployed the agar frog in the field, then, highlight these three columns of data for the time points where the model was deployed and **copy** (control + c for a shortcut) them.

3. Open the Ectotherm ER iButton Data Graphs.xlsx spreadsheet and paste (control + p) the data into the empty cells to the left of the graphs. If done correctly, the graphs to the right will populate with the temperature data collected by the agar model looking something like this:
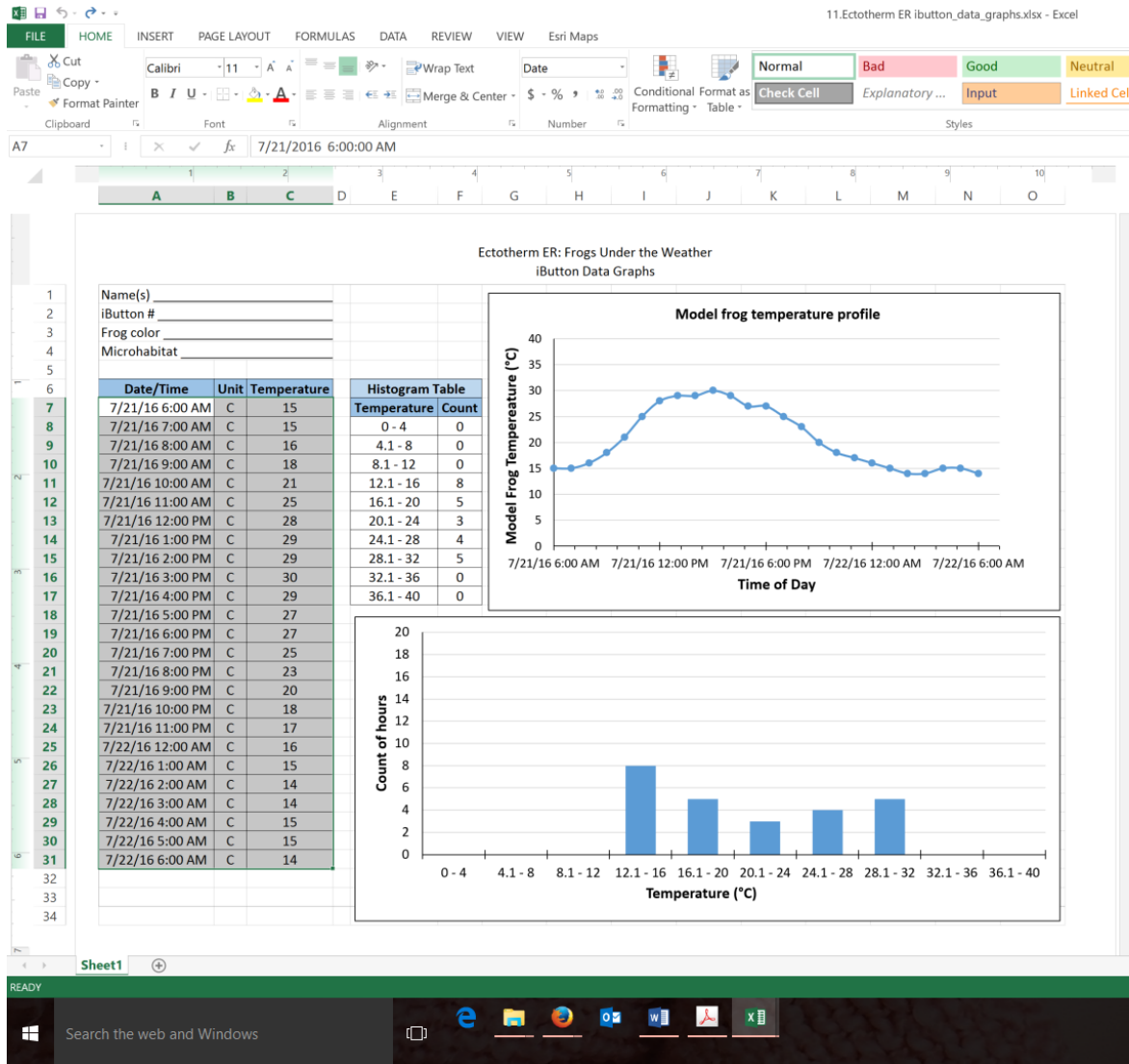
Do this for a few ibuttons to share with your class or print a copy of their own data for each student group… it's up to you!