Specific Heat of Solid

Directions and Suggestions for Teacher

Purpose:

This lab is designed to walk students through the process of finding the specific heat of a solid. Students will get a certificate when they complete this lab correctly and then if possible you can have them work through a similar lab in real life.

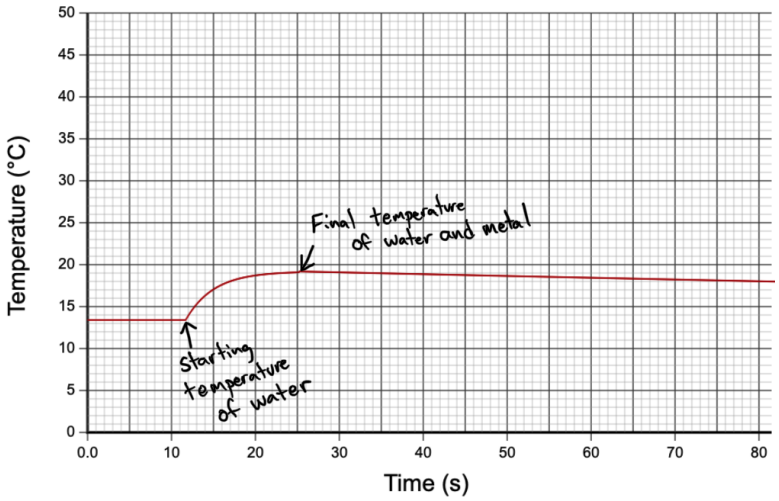
Virtual Part:

(https://thephysicsaviary.com/Physics/Programs/Labs/SpecificHeatSolidGuidedLab/)

This lab can easily be paired with a live lab that mimics the virtual lab step by step. The advantage to doing both parts is that students will have walked through the process before they start wasting time and materials on the live lab. This lab will guide the students through the procedure step by step.

Working Through the Lab:

I give students a paper lab sheet to record all the data they will be collecting for each step. They can move forward or backward as necessary, but once they put the hot metal into the cold water they will not be able to go to any of their previous steps. At the end of step nine their graph should look like that given below:



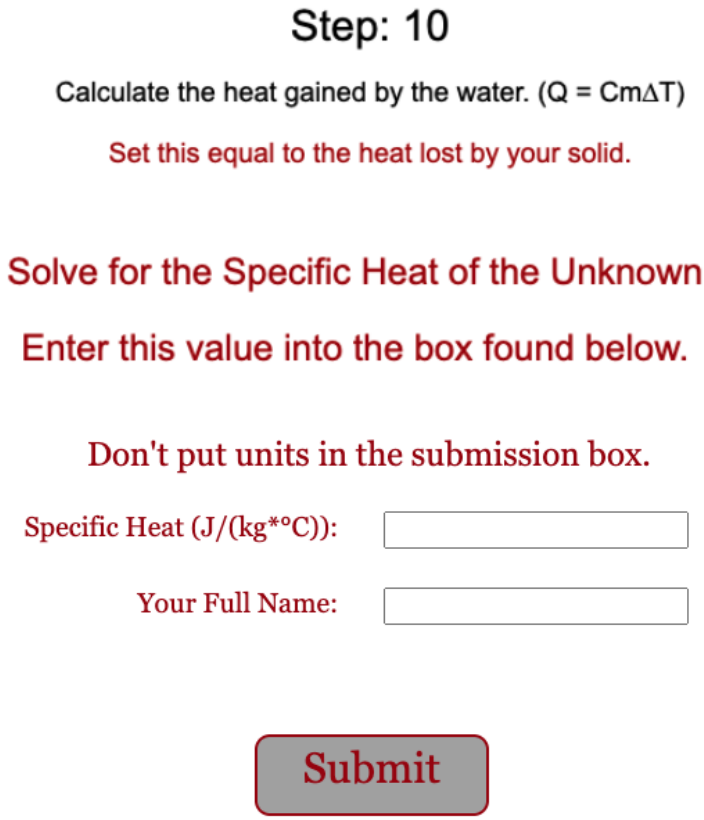
This lab was created by Frank McCulley for thephysicsaviary.com.

Students should copy their graph onto their lab sheet in the space provided. If they messed something up getting to this step, they should reload the program and start again. They will not be able to get the right answer if their preliminary raw data is bad.

Now students should complete the calculation table and show all of the calculations they made in determining specific heat. On screen directions will help guide them through this process.

Checking their work:

Once the students have reached the point where they have calculated the specific heat of their solid, they will then be able to check their work. Remind students that they all will be getting different answers and that they shouldn't worry if their answers differ from those of their classmates.



Students should not start the live part of the lab until they show you their completion certificates.

Live Part:

I would have the students complete a live part that is identical to what they did in the virtual part. Short density cylinders made of metals make great solids for this lab.

Conclusion:

I personally like to have students write out a conclusion by hand after they are done with the entire lab. Some things you can have students include in the conclusion.

1. **Restatement of the purpose.**
    a. This is a great way to open the conclusion
    b. It helps to reinforce the reason we were doing the lab.
2. **Brief Summary of the steps**
    a. I don't want too much here but I do want students to transition from the purpose to the results with a sentence or two summary of the steps.
    b. This part of the conclusion should paint with a very broad brush what type of data we were collecting and what remained constant when collecting data.
3. **Results**
    a. What did they get as the specific heat of their solid
4. **Error**
    a. They should talk about why there might be errors in their final answer and how they could modify things to get better results.

Going Further

If you have the time, you could have the students look up the specific heats of different solids and talk about the significance of specific heats of solids in different circumstances.