

Middle School Teacher Notes

October 19, 2010

Density Sim: This is an activity that was designed as part of a collaborative project with middle school teachers at Uplift Education in Dallas, Texas . One of the files is a pre-lab with real equipment written by Christine Denison. This document includes some of Christine's thoughts about how the activity went and possible changes. We may re-post this lesson before the next school year.

Teacher Notes incorporating Feedback from Christine:

1) Introducing terms of sinking and floating:

Christine used a short hands-on activity where students experimented with real materials and became comfortable with the words floating and sinking. (see Buoyancy Lab_ChristinesPreLab.docx)

2) Pre-lab

With the floating/sinking activity, Christine felt like her students were comfortable with these pre-lab questions. (see Density_PreLab.docx)

3) The Simulation Activity

See Density_SimActivity.docx

a. Open-play

Christine suggested having 5-10 minutes of open-play with the sim where students are exploring and figuring out what they can do ... to help them own the sim. We liked this idea.

She said working in pairs was good.

b. Report-out / Facilitated discussion

Christine thought following this open-play with a time where students share out what they discovered they could do with the simulation would be helpful to get everyone on the same page. Either having the students come to the front and "demo" some features, or having students direct the teacher as to what to do.

c. Other suggestions/modifications

Some suggested modifications from Christine, that I've integrated:

- Add in some stopping / check in / report-out breaks
- Move Q1g to end
- Add name to sheet.
- Change from "size" to "volume" or bigger/smaller

Christine also found that calculating density was too much for her students with the decimal places. I have left this activity in, but at the end.

4) Follow-up activity

Christine did a follow-up/review activity the next day which I am including as well. Here is what she did: (see sheet attached Density_Review_FromChristine.docx)

1. Played with sim for 5 mins without any instructions
2. Viewed a short clip of someone floating on the Dead Sea and discussed
3. Dropped an egg into water, and then dropped an egg in salt water to observe how the egg sinks in regular water but floats in salt water and discussed the density of water.
4. Students completed sheet attached using the sim in partners, and with guidance from me projecting the sim.

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5. We explored how low we could make the density and still have it sink, and how high we could make it before we got it to float. We also figured out how to change the mass and volume to get a density of 1. The students suggested also being able to use salt water for the sim :)

5) Post-Lab Question

See Density_PostLab.docx

This can be done the next time class meets. Should be done individually.