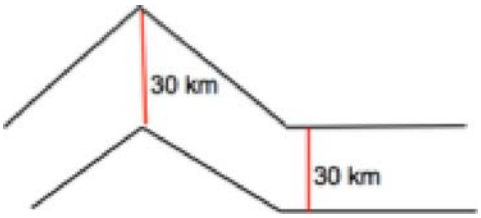
SCED 202 Learning Commentary

SCED 202: Matter and Energy in Earth Systems

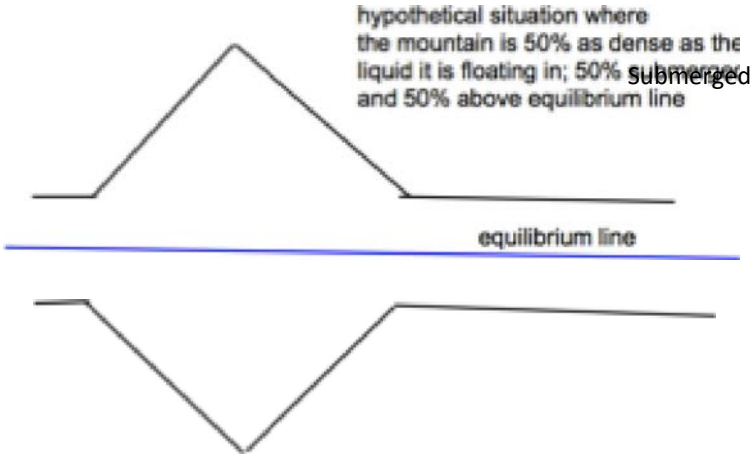
Cycla 3 dealt a lat with isostacy and its role in the geological aspects of Earth and the Earth's crust. Initially, I knew that two objects ot the same density, no matter what the size difference was, would float or sink in the same way, as seen in my understanding ot the cube of clay and the smaller piece of clay sinking in the graduated cylinder of water. As seen in my initial ideas for Actvity 2, I also understood that ice would float in water because the density ratio of ice to water was ratio that caused the ice to float, After learning the definition ot isostacyt 'the equilibrium condition between any floating Object. . . and the more dense fluid in which it is floating* (page 64}, I began to understand that an abject floating in a fluid has to maintain its percentage ratio with the fluid it was floating in. I was comfortable with all of these concepts as we were learning them in class and building aff of my prior knowledge about density; however, it took me a little bit of thinking before I could apply evenything I learned in Cycle 3 to actual properties at Earth's systems.

On page 79, there is a question asking what the bottom of the continental crust must look like under a region with mountains and valley± I first reed this question and thought about the fact that the average thickness of continental crust is about 30 km. Using this logic, I drew a picture like this:



I figured that since continental crust is about 30 km thick, it must be about 3D km everywhere, and therefore a mountain would kind af be floating in the mantle more so that the thickness of the crust was 30

Th i s thinking obviously was incorrect since a mountain daesnt float higher in the mantle than a valley- The density is about the same everywhere in the continental crust, so the equilibrium level must be the same, After same actual thinking about what I knew about continental Crust, density, and isostacy, I figured aut this picture above wasn't correct. My group members, Jenna and Nicole, and I talked about what this could actually look like- We began with using our knowledge about density and the percent submerged of an abject, and we simplified it into a hypothetical situation in which the density ot something wes 50% as dense the fluid it was in- Our group discussion led us to the conclusion that if an object was supposed to have 50% of its height submerged then the same amount at height should be below. We drew a sketch like this:



After making that sketch, we applied our idea to continental crust that floats in the mantle. Since continental crust is about submerged in the mantle, about 16% af the crust is above land, For example, it a mountain is 10,000 meters high above the equilibrium line, then 10.000 meters is about ot the total thickness or height ot the continental Crust. The tatel height at the continental crust at tha peek Of 10,000 meters would be 62,500 meters {since 10,000 is 16% af 62,500), using the same logic, if you were standing 100 meters above the equilibrium line on continental crust, there would be 625 meters at continental crust below you.

After discussing these ideas with my group, we put together a whiteboard of problem 6 and presented it with the class. A few other groups were assigned tha same question, and this entire class discussion really helped me to solidify my understanding of isostacy and how continental crust floated on the manfe, Seeing more pictures and having the concept explained to me from my classmates cemented this idea in my brain, and my initial struggle in grasping the concept also helped me to understand it more now, Understanding what the bottom of tha continental crust looks l i ke beneath mountains and valleys also later helped me in learning about how erosion builds mountains; I was able to apply what I learned in my understanding of new eoneepts,

Cycla 3 focused a lot on how the different types at crusts float on the mantle by incorporating knowledge about density and isostacy into new ideas, All ot the knowledge I learned culminated over time so I could grasp the big picture, and now Fm ready to move onto Cycla 4 and 5 with the knowledge I have developed.