2.7 Skip and Chip: Put Your Tongue on the Flagpole?

After talking about gas and liquid samples and how they interact, Skip and Chip now move on to discussing liquid and solid samples.

Chip: Hey Skip, I know we planned to go snowboarding or something, but I think I might just stay right where I am this weekend.

Skip: What's the problem Chip? If its money let me know and I can front you some cash.

Chip: No, after the last dating fiasco I just want to hang out around home. Don't want to get out and do anything for a little while.

Skip: Well you could get a little bit ahead on your chemistry Chip.

Chip: Oh yeah, chemistry, it always reminds me of something that happened to me. That whole decomposition reaction and single replacement reaction we experienced just keeps coming back to mind when I do my chemistry reactions.

Skip: Well, the good news is we are not in that chapter anymore, the whole kinetic theory applied to the states of matter is the topic at hand now.

Chip: I understood the gas particle stuff pretty well. I like the way the real gas particles don't behave in an ideal fashion turning into a liquid when pressure is high or temperature is low.

Skip: No doubt, those states of matter are great, but now we will be working on solids.

Chip: I really like that idea. I mean, solids don't move at all! So the little particles are just sitting there chilling like I'm going to do this weekend!

Skip: That's not exactly true Chip. If the particles did not move at all they would be at a temperature of -273 degrees Celsius A.K.A. Zero Kelvin. That's an absolute Chip, a big Zero K.

Chip: Well none of the solids I've touched have been that cold. Even the flagpole back in middle school that you got your tongue stuck on was probably only 20 below or so.

Skip: Don't remind me. I felt like and absolute zero that day for sure, and I was not going anywhere until you got that warm water and poured it on my tongue and the flag pole. I owe you big for that!

Chip: I'll cash in on that someday, but maybe we can learn from the experience. You were not motionless when you were attached to the flag pole, but you didn't really go anywhere either.

Skip: Yeah, even if I was able to pull away from that pole there was such a crowd I probably would not have gone far anyway. Maybe that's what solids are like.

Chip: I was reading in the book and they said something about "vibrational energy" where solid particles just sit there and vibrate around fixed points. *(pauses to think)*

Chip: You were shivering, moving but going nowhere, and the people watching you were shivering, but they didn't go anywhere either because they wanted to see you escape!

Skip: That warm water really did the trick; it kind of melted my tongue right off the flagpole without any pain or anything. After that everyone kind of left.

Chip: So when everyone was standing shivering, but not going anywhere, that does sound like the vibrational energy of a solid.

Skip: And when you poured the water the particles had enough energy to melt me loose.

Chip: Maybe that's what happens when a solid melts. The particles get more energy, vibrate and move around the fixed point faster until they finally free themselves from the fixed point and go with the flow.

Skip: They can flow once they are a liquid. I think you've got something on that melting thing. In fact I think it also reminds me of being in class.

Chip: How so?

Skip: When we sit in our desks fidgeting we are like the particles in a solid. We move around, but as long as our butts are attached to the desk, we aren't going anywhere.

Chip: Well I saw that one guy leg-press the whole row of kids in front of him when his seat was up against the back wall. They moved a little bit, but I guess all the desks were then slid back after the teacher yelled. So what do we look like when we melt into a liquid?

Skip: I think that when we get out of our seats, all our energy goes to getting up. We don't really move any faster, we just get up from the desk. It takes some energy. "We melt."

Chip: O.K. so we melted, now where do we go, outside and home?

Skip: No, then we'd be too far apart more like particles in a gas. That would be like sublimation.

Chip: How about we get out of our desks and go to lab. In lab we can move around, but we're still pretty close to each other, not like when we go home.

Skip: Makes sense to me. In lab we are free to move around, but then lab ends…

Chip: Lab ends and we go sit down again and that represents "freezing" back into a solid at our desks.

Skip: But sometimes we run our lab right up to the bell and leave class right from lab.

Chip: And we all go our separate ways too. I think that going from lab to leaving the room and going our separate ways works well for the boiling into a gas.

Skip: O.K. Chip, I think we've learned some things. Are you still going to stay home all weekend?

Chip: Well, I guess I'll just sit here and chill unless I get enough energy to melt away.

Author – Greg Zimmer