# Transcript for Video Clip 4.2

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| Teacher/video ID: | Fowler, 4.2_mspcp_gr.2_matter_fowler_L6_c12–c14 |
| Content area: | Properties of matter |
| STeLLA strategy: | Variety of Student Thinking Lens strategies |
| Context: | In this lesson on properties of matter, students are asked to share what they've learned about matter and changes in matter. |

**Video Clip 2**

| Time Code | Speaker | Discussion |
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| 00:00:00 | T | All right. |
| 00:00:01 | SN | Thank you. |
| 00:00:02 | T | Now, I put this big old chart up on the board. And it says "What I Learned." So I want you to think about something you didn't already know before we started-Frank. |
| 00:00:11 | T | Think about something new that you learned. Something you didn't already know. Or maybe something you thought you knew, but you figured out you were wrong. |
| 00:00:22 | T | And raise your hand if you want to share, so we can put it up on our board. Arianna, what did you learn? |
| 00:00:27 | SN | I learned that when you take, like, crayons, melted-up crayons, and you put it in snow for, like, 1 or 2 minutes, it will turn into a solid again, but not in the same shape. |
| 00:00:39 | S | 'Cause if it would turn into the same shape, that'd be kind of weird. And cool. |
| 00:00:47 | T | Do you know … Speaking of which, I'm going to totally sidetrack. |
| 00:00:52 | T | I read an article about a guy who goes to— Have you guys ever been to a restaurant where you get, like, a couple packs of crayons to color with? |
| 00:00:56 | SS | Yes. |
| 00:00:57 | T | So I found out the restaurants throw those crayons away. He goes, and he collects them all. |
| 00:01:01 | T | He melts them down, he creates new crayons, and gives them to kids in, like, orphanages and hospitals that are sick. |
| 00:01:07 | SN | Awesome. |
| 00:01:08 | T | It's kind of a cool thing. Sorry. Totally sidetracked. OK, so you learned that liquids …? |
| 00:01:14 | SN | Can also be turned back into solids. |
| 00:01:17 | T | OK. So you learned that we can turn solids to liquids. |
| 00:01:27 | S | And then turn the liquid back to a solid. |
| 00:01:30 | T | And back to solids. |
| 00:01:36 | SN | Are we supposed to copy that chart down? |

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| 00:01:37 | T | No, you don't have to copy a thing. So let me ask you a … a tricky question. You guys ready? Could I do this with any solid? |
| 00:01:44 | SN | Yes. |
| 00:01:46 | SS | No. |
| 00:01:46 | T | Could I take any solid [and] turn it into a liquid? |
| 00:01:48 | SS | Yes. |
| 00:01:49 | SN | You can't do it all. You can't do it with a rock. |
| 00:01:52 | T | Hold on. Think for a second. |
| 00:01:53 | S | Yes? |
| 00:01:54 | T | Think about solids that we've talked about. Think about … could you take any solid [and] turn it into a liquid? |
| 00:02:00 | SS | No. |
| 00:02:01 | SN | In air. |
| 00:02:03 | SN/T | Yes. / Raise your hand. |
| 00:02:04 | SN | Actually, no. |
| 00:02:05 | SN | Wait, what are we talking— |
| 00:02:06 | T | Draven. |
| 00:02:07 | SN | No. |
| 00:02:08 | T | No, and why do you say no? |
| 00:02:10 | S | Because some liquids can be hard to melt. And … |
| 00:02:17 | T | So some may be hard to melt? Could you give me an example of a solid that we could not turn into a liquid? |
| 00:02:25 | SS | Um … |
| 00:02:27 | SN | [Inaudible] |
| 00:02:30 | SN | Iron? |
| 00:02:31 | T | Iron? OK. That might be difficult to melt. All right, Jeremiah, what do you think? |
| 00:02:37 | SN | Only with [inaudible]. |
| 00:02:38 | SN | A tree. |
| 00:02:40 | T | Ooh, a tree. Is a tree a solid? |
| 00:02:43 | S/T | Yes. / Yes. Could we melt it into a liquid? |
| 00:02:46 | S/T | No. / Add heat to it and turn it into a liquid? |
| 00:02:48 | SS | No. |
| 00:02:49 | T | No. That'd be kind of weird. So we just proved that no, not all solids can be turned into liquids. |
| 00:02:56 | T | Jeremiah, what'd you learn? |
| 00:02:57 | SN | I learned that everything has molecules. |

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| 00:03:05 | T | Ooh, can you say that louder? |
| 00:03:08 | S | I learned that everything has molecules. |
| 00:03:11 | T | I like it. So we talked about that yesterday, right? |
| 00:03:14 | T | Everything. And I'm going to change those around again. Instead of saying everything has molecules, can I say everything is made of molecules? |
| 00:03:22 | SS | Yeah. |
| 00:03:23 | SN | Even your foot? |
| 00:03:24 | E | [Inaudible] |
| 00:03:29 | T | All right. Everything's made of molecules. I think that was the big one you guys discovered. |
| 00:03:34 | T | All right, Lydia. What'd you learn? |
| 00:03:36 | SN | I learned that if you have two bags of baking soda and vinegar [and] if you take the vinegar and mix it with the thing, and you put it on that little measuring scale thing, they'll still weigh the same. |
| 00:03:51 | T | I love it. So you shared the experience. What was the big concept we learned? |
| 00:03:55 | S | We learned that no matter what, if you mix up vinegar, it will still be the same weight, except both of them just mixed together. |
| 00:04:03 | T | And we used that to answer the question that if we change the state that our matter is in, are we changing the number of molecules and atoms? |
| 00:04:13 | SN/T | No. / No, right? And that's what the weight told us? |
| 00:04:15 | S | Yes. |
| 00:04:16 | T | So that was a big one from yesterday. So we can change … matter. |
| 00:04:29 | T | But the number of atoms and molecules stays the same. |
| 00:04:38 | T | Of molecules. Actually, I don't want to say molecules. Let's say atoms. Of atoms stays the same. |
| 00:04:48 | T | OK. And how do we get ice to melt? What does it need? |
| 00:04:51 | SN | Um … heat. |
| 00:04:53 | T | Heat. Ooh. That was a big one. And then if we want to go from a liquid to a solid, what do we do with the heat? Ava. |
| 00:05:03 | SN | Um … freeze the molecules. |
| 00:05:07 | T | OK. But how do we do that? |
| 00:05:09 | S | Um … we take away the heat. |
| 00:05:14 | T | High five. Good job. So we know that heat can help melting. Or can cause melting. So it can cause solids to become liquids. |
| 00:05:28 | T | Solids to become liquids. |
| 00:05:36 | T | And that if we take away the heat—oh my gosh, it's getting tiny down here—take away heat to become a solid. |

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| 00:05:48 | T | Who could raise their hand and give me an example of a time that we took heat away from something and created a solid? |
| 00:05:54 | SN | Ice. |
| 00:05:56 | T | Ezra. |
| 00:05:57 | S | Ice. You can take the ice from water, and … you can take ice from water. |
| 00:06:06 | S | Because if you … if you … if you make … make heat to the … the heat to something like … like ice, it can turn into a liquid. |
| 00:06:21 | T | Yeah, so when we had the ice, we added heat to it, it became a liquid. All right. Anybody have a different example, 'cause we did some fun stuff that day. |
| 00:06:28 | T | Ariana, what else did we take away heat from that became a solid? |
| 00:06:32 | SN | Chocolate chips. |
| 00:06:33 | T | Chocolate chips. |
| 00:06:34 | S | 'Cause we had that thing, like, glass thing, and we put chocolate chips, snow, and the other one was crayons. And we melted all of them at the same time, and it all turned into a liquid. |
| 00:06:47 | T/S | Mm-hm. / Except the chocolate chips, not so well. |
| 00:06:50 | T | Yeah, they got kind of funny. |
| 00:06:51 | S | And then we let them melt. |
| 00:06:53 | T | All right, and then … then we turned them back into solids, 'cause we took the heat away, right? |
| 00:06:59 | S/T | From the— / So the … the chocolate went back to being a solid, right? |
| 00:07:03 | S | Yes. |
| 00:07:04 | T | And then the crayon went back to being a solid. |
| 00:07:06 | S | Yes. |
| 00:07:07 | T | And then the water went back to being a solid? |
| 00:07:08 | SS/SN | No. / Yes. |
| 00:07:09 | SN | It turns into a gas. |
| 00:07:11 | T | Why didn't it … why didn't the water turn back into a solid? |
| 00:07:16 | SN/T | Actually— / [Inaudible] Why didn't the water turn back into a solid? |
| 00:07:20 | SN | Heat. |
| 00:07:21 | T | When we put it back on the ice. |
| 00:07:23 | SN | Because we didn't have the … the … |
| 00:07:33 | T | Need some more think time? |
| 00:07:35 | S/T | Yes. / OK. Jeremiah, why didn't the ice … yeah, why didn't the water turn back into a solid? |
| 00:07:40 | SN | Because it … it wasn't cold enough. |
| 00:07:44 | T | Perfect! It wasn't cold enough. |