

# Classroom Transcript: Thermal Energy



## Lesson 3 Small Group

- 1 Teacher: Everyone open up their screens and reset it. Go to speed shading. And we go to that...  
2 take off speed shading. So your screen looks just like mine.
- 3 Student 1: Slow motion or no?
- 4 Teacher: You want to leave... Should we do slow motion on?
- 5 Class: No.
- 6 Teacher: Okay. Take off slow motion.
- 7 Student 2: And press start?
- 8 Teacher: So hold on. What I want you to do, before you press start, is paying attention because  
9 what we noticed in the other one is that... said that it's starting to travel down here. Look  
10 at this first row of purple, when you click start and tell me if you notice any changes  
11 starting to happen. So it's about that. Let's give everyone a chance to look at it. So press  
12 start and tell me if you notice anything happening differently on those rows.
- 13 Student 3: Oh. Oh!
- 14 Teacher: Oh, I hear some "Oh's", some ideas are happening. You get to-
- 15 Student 3: Click up. All of them are moving now.
- 16 Teacher: Oh, I hear-
- 17 Student 3: Hold up, hold up, hold up.
- 18 Teacher: What do you mean?
- 19 Student 3: All of them are moving.
- 20 Teacher: Let me see.
- 21 Student 3: It started off ... I just seen, a shockwave just going down and then I just seen... by time,  
22 each section is moving. At first-
- 23 Teacher: Oh, that's what you meant by shockwave. Like, each section starts to move?
- 24 Student 3: Yeah. Yeah.
- 25 Teacher: Can you guys reset it so I can see that?
- 26 Student 3: Look you see the shockwave?
- 27 Teacher: Aah! Oh. So it's-



28 Student 3: And then all of them start moving.

29 Teacher: Interesting. Why don't they all start moving at the same time?

30 Student 3: I don't know. Maybe-

31 Teacher: Hmm.

32 Student 3: Maybe because it takes time for... since they are all bumping, they're making more heat  
33 and it takes more time for the heat to get stronger so it would spread all over the place.

34 Teacher: So you're saying they need to start creating more heat to be able to spread?

35 Student 3: For example, if you cold, right?

36 Teacher: Mm-hmm (affirmative).

37 Student 3: Like, you're freezing, it's compared to a candle and then to a huge just campfire around  
38 you.

39 Student 4: It's also like to have-

40 Teacher: Oh, so if there's a campfire around you-

41 Student 3: It would be much hotter because it's a lot more-

42 Teacher: Oh.

43 Student 3: ... heat. So compared to a candle it's not going to do anything.

44 Teacher: So is this more like a candle or a campfire?

45 Student 3: It starts off like a candle-

46 Teacher: It starts off like a candle then...

47 Student 3: It gets like a campfire.

48 Teacher: Because now everything's moving?

49 Student 3: Yeah.

50 Teacher: Oh, interesting connection or analysis.

51 Student 4: ... when it's a big room and it's heating up, it takes longer for it to heat up-

52 Student 3: Yeah, exactly.

53 Teacher: Oh-

54 Student 3: It goes from a candle to a campfire like I'm saying it goes from little to big.

55 Teacher: Oh okay so little big. And you're saying if there's a bigger room it takes longer to heat up.  
56 So what if I had just the same amount of green, but the whole bottom half of that screen

57 was purple. Do you think that shockwave would travel as fast all the way down to the  
58 bottom?

59 Student 3: No, it would take time. I would say, a lot longer. Because there's more purple, there's  
60 more cold than heat.

61 Teacher: Oh. More cold than heat, so it would take longer for-

62 Student 3: Unless, unless-

63 Teacher: Unless.

64 Student 3: Unless, like the heat... depends how much heat there is. You know what I'm saying?

65 Teacher: I don't. No it's okay, I just want... I'm curious.

66 Student 3: It's like... It's hard to explain because...

67 Teacher: When you say less heat, do you mean less molecules that are warm, or the temperature  
68 is lower?

69 Student 4: Is the temperature lower?

70 Student 3: Yeah.

71 Student 4: Is it, because the molecules need to heat up first, just to-

72 Student 3: Yeah, he's right.

73 Teacher: So, if there's a higher temperature of those molecules, it'll spread faster?

74 Student 3: Maybe.

75 Teacher: Maybe? What about if there were more hot molecules that, say medium temperature?

76 Student 3: It would go fast.

77 Student 4: It would go fast but still needs time.

78 Student 3: Yeah, it'll take it's time.

79 Teacher: Okay. Good, I like thinking about that, like the candle versus the campfire, or how a  
80 bigger room takes longer to heat up.

81 Student 3: Yes.

