

Transcript for Video Clip 7.3

Teacher/video ID:	Kawamura, 7.3_optional_stella2-03_kawamura_c1-c3
Content area:	The Sun's effect on climate
STeLLA strategy:	Select content representations and models matched to the learning goal and engage students in their use (SCSL strategy D).
Context:	Video clips 1a and 1b capture a class discussion after students use a lightbulb, a Styrofoam ball, and a Hula Hoop to model Earth's orbit around the Sun and explain opposite seasons in the Northern and Southern Hemispheres. In clip 1c, a new content representation emerges as the class discussion continues.

Video Clip 1a

Time Code	Speaker	Discussion
0:00:00.7	T	As I was walking around, I saw some interesting things going on.
0:00:03.3	T	But before we even talk about what you experimented with and what you saw, first off, let's talk about ... Are these the best representations for us to use?
0:00:12.2	SS	No.
0:00:12.5	SN	Yes.
0:00:13.1	T	What makes them good representations? Sarah.
0:00:17.2	SN	They ... the Sun is in the middle, and there's a Hula Hoop that's ... that ... it's big enough for the orth's earbit ... the Earth's orbit.
0:00:26.1	S	And the Earth can go around it, and you can spin it, too, but that's not exactly the project. But ... and you can tilt it, and you can go around and around.
0:00:35.8	T	OK, so you feel like these are pretty good representations for you to manipulate. Anything else?

Video Clip 1b

Time Code	Speaker	Discussion
0:00:44.3	T	OK. Why do you think maybe this isn't the best representation?
0:00:49.4	SN	Because the Earth's orbit isn't a perfect circle; it's more of an egg shape.
0:00:57.5	S	And so, when it's a perfect circle, well, for us in the winter, on our egg shape orbiting around, I think in our winter, it would be more like ... So say this is the
0:01:17.7	S	I think we'd be more up around here. And—
0:01:21.4	T	What do you mean by “up around there”?
0:01:23.4	SN	She means ... she means, like ... she means, like, in our orbit, 'cause it ... 'cause we'd be closer to the Sun at sometimes, but we'd be farther out here sometimes.
0:01:33.0	SN	Mm-hm.
0:01:33.8	SN	Then we get closer ...
0:01:35.2	SN	I don't think it's fair, because it's a perfect circle, and the same distance for everywhere all the time.

0:01:41.3	T	Hmm. That's an interesting thought. We are really going to talk about the orbit in a little bit.
0:01:47.1	T	But right now, definitely this is going to be our orbit, but we'll talk a little mo-more about the orbit shape.
0:01:53.2	T	But right now it sounds to me like you're saying that in our winter months, the Earth would ... our ... where the Northern Hemisphere is farther away from the Sun.
0:02:03.2	S	Or ... so say this is us right there.
0:02:10.9	S	Or it could be, like, when we're right here. Or it can be more further away.
0:02:16.4	T	OK.

Video Clip 1c

Time Code	Speaker	Discussion
0:02:21.5	SN	I just wanted to say one thing we did for how ... how, like, it's not a perfect circle. We moved the lightbulb a little closer to one side, then ... and then the other.
0:02:33.8	S	So it's like the circle's like this, and the lightbulb was, like, here and not in the middle. So it's more like the real thing then.
0:02:42.5	T	Are you saying that in our Earth's orbit, you don't think that the Sun is in the middle of the orbit?
0:02:48.5	S	No.
0:02:48.9	T	You think the Sun is closer to—
0:02:50.7	S	Yeah. Because of the climate.
0:02:53.1	T	Can you draw a picture of that?
0:02:55.1	S	Mm-hm. With what?
0:02:58.8	T	On the board.
0:02:59.9	S	OK.
0:03:05.6	S	If the Sun was right here, and this was the Earth's orbit, it'd be more like this, I think. And the Earth would be rotating around it.
0:03:19.0	T	And where would the Earth be during the summer?
0:03:22.6	S	It would be right here. Well ...
0:03:25.1	T	So can you put an <i>X</i> or an <i>S</i> there, for summer?
0:03:27.8	S	OK.
0:03:28.4	T	Where do you think the Earth would be during the winter?
0:03:32.2	S	It would be right here.
0:03:35.4	T	OK, whose summer did you represent?
0:03:39.9	S	Ours.
0:03:40.7	T	What do you mean by "ours"?
0:03:42.5	S	North America, because if it goes here, the Earth ... it would be going like this.
0:03:48.5	S	We did a ... I saw a thing with the shadows.

0:03:51.8	S	If ... if the shadow was way bigger on the Northern Hemisphere when it got to the closer end of the circle and the shadows were smaller,
0:04:05.9	S	the Norther ... in the win ... in ... when it was farther, and in the su ... in the Southern Hemisphere, it wa ... they were smaller here.
0:04:18.0	S	And they were larger here, because it ... the light could go farther and get bigger and
0:04:30.4	T	Where is the Earth warmer?
0:04:33.4	S	Here.
0:04:34.6	T	What part of the Earth is warmer there?
0:04:36.9	S	Northern Hemisphere.
0:04:38.0	T	Well, what's going on with the Southern Hemisphere?
0:04:40.6	S	Oh, I don't know, but I couldn't ... The shadow isn't as big as it was.
0:04:44.7	T	OK.
0:04:45.4	S	That's what ... that's what I thought.
0:04:47.5	T	All right. So we will ... I want you to leave that representation up. We will look back at that in a little bit and see ... Thank you for drawing that up there, Zach.
0:04:55.6	SN	That ... that doesn't make sense, though, because that means the Sun for ... for, like, South America, when it's summer then, that means the Sun would have to move all the way over there to—
0:05:05.1	T	Do you want to go ... Can you use the representation to show us what you're thinking?
0:05:08.1	S	Yeah, like, so if it's summer, so, like, it's close there, and it's winter for us, the Sun would have to move all the way over here to make it to the same, basically. So—
0:05:20.1	T	So you're saying that even though, like, it's winter and it feels colder to us—
0:05:24.3	S	It's warm to them, so it ... that diagram does not make sense.
0:05:27.9	T	And so if the Earth is there, you're saying it doesn't make sense because then it would be cold in the Southern Hemisphere, too, because it's so far away?
0:05:34.3	S	Yeah. So I'm saying it has to be in the middle.
0:05:36.8	T	What do you think?
0:05:37.9	SN	Well, I ... I agree with Zach, and I disagree with [inaudible] ...