

Transcript for Video Clip 6.4

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Content area:	The Sun's effect on climate
STeLLA strategy:	Set the purpose with a focus question or goal statement (SCSL strategy B). Engage students in making connections by synthesizing and summarizing key science ideas (STL strategy 7). Select activities that are matched to the learning goal (SCSL strategy C).
Context:	In this lesson on the Sun's effect on climate, students observe that not all locations at a given latitude have the same average temperature, which indicates that factors other than the angle of sunlight and Earth's orbit and tilt may impact the climate of a region. In this clip, students are discussing factors that impact temperature, including the angle of sunlight hitting Earth's surface at different latitudes and times of the year and proximity to large bodies of water.

Video Clip 4

Time Code	Speaker	Discussion
0:00:01.3	SN	OK.
0:00:01.6	SN	Well, more like a hundred degrees. And it's more heat over here in the summer, June through August, because the Sun is more direct in our area than it is during December through February.
0:00:16.5	SN	Because it's closer to the equator.
0:00:18.2	SN	Yes.
0:00:18.8	SN	And the Sun's rays directly hit the equator.
0:00:21.4	SN	Yes.
0:00:24.3	SS	And ...
0:00:25.0	SN	It's hot also here ... Sorry. Hotter also down here also, because it's closer to the equator and since the Sun's rays hit the equator at an angle, it ...
0:00:40.5	S	the rays don't just stop at the equator. It goes like this, so it's closer over here.
0:00:45.0	SN	Yeah, 'cause the equator's like right down here, so ...
0:00:48.6	SN	So, also if we're looking at this one for December and February ... up here in this corner, it's ... this is actually colder than it is here because ...
0:00:59.6	S	maybe because it's closer to the lake or maybe because it's not close ... it's not close to the lake at all.
0:01:05.6	SN	Or 'cause it's ...
0:01:05.9	SN	It's closer to the ...
0:01:07.1	SN	Or because ...
0:01:08.0	SN	It's not, like, an example is down here. It's closer to the equator ...
0:01:12.1	SN	The Gulf of Mexico. It's closer to the [inaudible].
0:01:14.2	SN	Even though it's ... it's by water, it's still closer to the equator, and the Sun is more directed over here than up here.
0:01:23.1	SN	The reason why Minnesota and ...

0:01:24.7	T	And why is that?
0:01:26.5	SN	Why's what?
0:01:26.9	T	Why is the Sun directed more directly here in the southern United States than it is in the north?
0:01:32.3	SN	'Cause—
0:01:32.9	SN	That's where the equa—
0:01:33.7	SN	The Sun—
0:01:34.0	T	Sarah?
0:01:34.7	SN	Like, the equator would be, like, like around, like, right here.
0:01:38.6	T	All right.
0:01:39.1	S	And the Sun is most directly towards the equator, and so this is closer to the equator than it is up here. So it's more sunlight.
0:01:47.4	T	So ...
0:01:48.3	SN	Even those ... these aren't technically considered the tropics, they're ... because they're not inside the Tropic of Cancer or the Tropic of Capricorn ...
0:01:55.5	T	Nice.
0:01:55.8	S	they are, to us, tropical.
0:01:58.8	T	Is there a correlation between latitude and temperature then? Because ...
0:02:05.5	SN	The higher—
0:02:05.7	SN	Yes, because the higher ...
0:02:06.2	T	These states are—
0:02:06.7	S	the higher you go, the lower the temperature it gets because you're getting further away from the direct sunlight, and the closer you get, the warmer it gets, 'cause you're getting closer to the direct sunlight.
0:02:16.1	T	OK. All right.
0:02:23.8	SN	All right, let's talk about the winter. And—
0:02:26.0	SN	Yeah. It would be the same with this one. It would be hotter down here during wintertime because the ... it's still closer to the equator.
0:02:34.9	SN	And then ...
0:02:35.2	SN	But ... yeah.
0:02:36.6	SN	And then it'd be colder up here since it's further.
0:02:38.3	SN	Because it's ... well, of course, wintertime and—
0:02:42.2	SN	And since the—
0:02:43.2	SN	Further away from the equator, and the Sun's having summertime in a different area.
0:02:47.9	SN	And the Earth is changing.
0:02:50.3	T	Question for you, then. Why the extremes north to south in temperatures these times of the year? June to August, December to February? What's ... what's going on here?
0:03:04.6	SN	That's summertime. And this is winter.
0:03:06.8	SN	Be ... because we came—

0:03:06.9	T	I-I know. But within these periods, summer and winter periods.
0:03:12.1	SN	Uh ...
0:03:12.5	SN	While the Earth is rotating, it would be summer over here, and then when it's rotating this way, it would be then winter.
0:03:19.1	T	Yes, but we're talking about the United States.
0:03:21.7	S	Yeah.
0:03:21.9	T	So whether it's summer or winter. So why the difference? This is yellow here, and down here we have pink and some red.
0:03:32.3	SN	Because the yellow is colder, which is at 60 degrees, and it'll be cooler there because it's further away from the equator.
0:03:43.5	S	And the Sun's rays [are] not—
0:03:44.4	SN	The Sun's not hitting directly in that area. It's hitting directly on the equator.
0:03:50.0	T	Directly on the equator?
0:03:51.2	SN	It's—
0:03:51.3	SN	Well—
0:03:51.6	SN	since this is closer to the equator, this is going to be warmer because the rays are just getting there and making this warmer and—
0:03:58.9	SN	The rays are going up.
0:04:00.3	SN	Yeah, the rays are going everywhere to make this warmer than over here, because it's colder over here because it's further away from the equator,
0:04:09.5	S	so when the rays get to there, they're a little cooler, and ...
0:04:14.1	T	Can the rays be cooler?
0:04:15.8	S	Um ...
0:04:16.1	T	You say when they hit here, the rays are cooler. Is that really what you mean?
0:04:19.7	S	No, I mean ...