

Transcript for Video Clip 5.2

Teacher/video ID:	Michelle Bernstein, 5.2_stella_et_bernstein_L2_c2
Content area:	Energy transfer
STeLLA strategy:	Identify one main learning goal (strategy A).
Context:	Continuing a lesson on energy transfer, the teacher elicits student observations about the speed and energy of two marbles rolling down ramps of differing heights. Students discuss which marble has the most energy based on evidence from the activity.

Video Clip 2a

Time Code	Speaker	Discussion
0:00:01.6	T	So can you tell me a little bit about what you guys have discovered in doing this?
0:00:04.3	SN	Oh, I think this ... I—
0:00:06.3	T	Hold on. Christian was talking first.
0:00:07.7	SN	I was think ... because this one, it shoots fast, but that doesn't make this one ... would not be with it, because look.
0:00:15.6	S	If— This will take forever, but after it rolls for a while ...
0:00:20.3	T	Uh-huh.
0:00:20.5	S	it will fi ... get there.
0:00:22.4	T	Well, I want ... I want you to really focus on what's happening with the ramp and the marbles.
0:00:26.8	SN	This one keeps bouncing, though.
0:00:28.9	T	Well ...
0:00:29.1	SN	Well, like, you can ... can you do the—
0:00:32.1	SN	[Inaudible] mostly as well as this one, though.
0:00:34.4	T	Well, OK, so you changed it. Let's do another test and see.
0:00:36.5	SN	Well, that probably had it before.
0:00:38.1	SN	Here, put that marble there, right?
0:00:38.7	T	Do you see ... do ... if you do it that way, do you still see a difference in the two marbles?
0:00:42.3	E	[Inaudible]
0:00:44.9	T	So try it again.
0:00:46.3	SN	[Inaudible]
0:00:47.1	T	Because it helps if someone's on this side doing the marbles. Ready? Three, two ... Oh, same time, guys.
0:00:56.3	SN	Ready?
0:00:56.5	SN	'Cause this one's still the fastest.
0:00:57.6	SN	Three ...
0:00:57.9	T	All right.
0:00:58.1	S	Go. Go.

0:01:00.1	T	So you said this one is still the fastest.
0:01:02.1	S	Yeah.
0:01:02.8	T	Why is this ramp—
0:01:04.1	S	Because it has a little more of an elevation.
0:01:05.1	SN	Because it's at a higher level.
0:01:06.6	T	So which one—
0:01:07.3	SN	This one starts at a higher level.
0:01:08.6	T	So then which one has more energy?
0:01:10.5	SN	This.
0:01:12.1	SN	This one.
0:01:12.3	T	What evidence do you have that you can tell me that this— Oh, so Logan's saying that one has more energy, and the rest of you are saying this one has more energy.
0:01:17.8	S	We've still got [inaudible].
0:01:18.9	SN	I think this one has more energy because it's higher, so it's making the ball go faster.
0:01:21.7	T	So it's higher. What do you mean by "higher"?
0:01:25.0	S	Like, more steeper.
0:01:26.6	T	It's steeper. When we say "steeper," what does that mean?
0:01:29.5	S	Like, pretty much straight. It's going fast—
0:01:32.0	T	So it's at a different angle. OK.
0:01:33.4	S	Yeah.
0:01:33.7	SN	I think ... I mean I'd say this one's higher because it's not as high, but it still goes as far, and it's using the ... it has more energy.
0:01:40.9	T	So let's ... let's not focus on distance right now. Let's focus on speed. So ...
0:01:45.6	SN	And then you try to—
0:01:46.4	T	You start this one. You start that one. Ready? Three, two, one, go.
0:01:54.2	SN	Oh!
0:01:54.5	SN	See, that one took a while.
0:01:56.3	T	So there you go. Solve that problem, and let's try again.
0:02:00:0	SN	Boom, boom.
0:02:00.6	T	Three, two, one.
0:02:04.2	SN	I started before it.
0:02:05.3	T	OK. You've got to start at the same time.
0:02:08.1	T	You ready? Last time. Three, two, one.
0:02:13.2	T	So do you still say that that one has more energy? So what changed your mind?
0:02:18.9	SN	Because the—
0:02:20.1	SN	You see this one here.
0:02:21.3	SN	It's—
0:02:21.5	SN	Hold on. No.
0:02:21.9	SN	This one is at a higher level to the marble.

0:02:25.2	T	OK.
0:02:25.4	S	Roll at a higher speed.
0:02:26.6	T	OK. So we're saying ... Well, what I'm hearing is that this one is at a higher level. It has more speed, so therefore ...
0:02:32.5	SN	And more energy.
0:02:32.7	T	it had more energy. OK. OK.

Video Clip 2b

Time Code	Speaker	Discussion
0:02:38.7	T	Now this is a question I want you to talk about with your groups for just a second.
0:02:44.4	T	Now we notice that one marble was fast, and it was faster than the other marble. They both were moving. Christian.
0:02:53.4	T	But I want you to have a discussion with your group, and I want you to give me some ideas and some ... some facts that we can kind of go with in our next step.
0:03:00.9	T	Which marble—the fast marble or the slower marble—has the most energy? So I want you to talk with your group and come up with what you guys think. So go ahead and get started.
0:03:14.4	E	[Inaudible]

Video Clip 2c

Time Code	Speaker	Discussion
0:03:19.0	E	[Inaudible]
0:03:20.4	T	OK, so what you're saying is this one, even though it's not going as fast as the other one ... it still has energy.
0:03:25.9	SN	This one, a lot.
0:03:26.5	T	So which one did you say has the most energy?
0:03:28.7	SS	The slower one.
0:03:29.1	T	The slower one. OK. Because you're saying that that one really doesn't have more energy because the angle of the ramp is what's giving it its energy.
0:03:37.2	S	Yeah, [inaudible].
0:03:38.1	T	So this one has to have more energy because it doesn't have the help of the angle of the ramp.
0:03:41.7	S	Uh-huh.
0:03:42.4	T	OK. That's what I ... that's what I was making sure I understood what you were saying.
0:03:46.3	T	So can you tell me more about ... about that? Because I'm not sure I quite understand...
0:03:50.8	SN	[Inaudible]
0:03:51.9	SN	Where's our marble?
0:03:52.6	T	That's it.
0:03:53.4	SN	This is saving energy. And this is just using all of it to go down the ramp.

0:03:57.7	T	OK. So this one here is conserving its energy. It's moving slower. And that one's just using it all up in that one big ramp. OK.
0:04:06.5	SN	The fast marble—
0:04:07.2	T	All right. Let's see if we have others that agree with your prediction. Very interesting thinking, but I like the ... the way that you're processing through that.
0:04:15.1	SN	Down—

Video Clip 2d

Time Code	Speaker	Discussion
0:04:19.4	T	... can see.
0:04:20.1	SN	We think the smaller one has the most energy, 'cause it ... it will catch up to the fast one at some point. It just won't be like—
0:04:28.8	T	OK. So the slower one has more energy than the faster one?
0:04:33.3	SN	Yeah. It's using more of the energy to go ... get where these faster ones.
0:04:37.4	T	OK. So it has to use more of its energy to get as far as the fast one went.
0:04:41.7	S	Right.
0:04:42.6	T	Because it started off faster.
0:04:44.4	SN	Yes.
0:04:44.7	SN	I still think it's the faster marble.
0:04:46.3	SN	Me, too.
0:04:46.5	T	So why do you guys think it's the faster marble and not the slower marble?
0:04:48.9	SN	Because ... because ... because lookit. It rolled—
0:04:52.8	SN	I think it—
0:04:53.9	SN	Well, I think it's just—
0:04:55.4	T	Let them finish their thoughts.
0:04:57.1	SN	I think that the faster one has more energy ... because usually when we were testing it out yesterday, it was faster. It has more energy, but slow doesn't have as much.
0:05:06.8	T	OK. And what do you think?
0:05:09.1	SN	But I'm thinking that ... 'cause look. Watch. That ... You see how that one goes down the ramp and lands right here?
0:05:14.4	T	Uh-huh.
0:05:14.9	S	Well, this one does the same.
0:05:16.6	SN	No, it's—
0:05:17.4	SN	But it's going slower and it ... See.
0:05:20.2	SN	Yeah, like—
0:05:20.6	SN	It's going—
0:05:20.9	SN	On the faster one—
0:05:21.7	T	Ooh, you guys are going to have to figure out a ... an agreement here. We're going to have to get some more evidence, right, because we don't have—
0:05:27.1	SN	Half of the table will go fast, half will go ... three four— Three fifths of the table will

		go slow.
0:05:33.4	T	So two fifths say fast; three fifths say slow?
0:05:35.4	S	Yup. We'll do that.
0:05:36.3	T	So we're going to have to come up with an agreement here because one of you might be right, and one of you might be wrong, but we don't know yet.
0:05:42.8	T	So it sounds like this table needs some more evidence to help them come up with their ...
0:05:46.8	SN	Lookit.
0:05:47.0	T	their final thought.
0:05:48.1	SN	But no, no, I—

Video Clip 2e

Time Code	Speaker	Discussion
0:05:53.3	T	So we're going to go ahead, and we're going to fill out the two first lines on our paper.
0:06:00.7	T	Ramp 1 compared to Ramp 2. Was the speed of the marble faster or slower?
0:06:07.4	SS	Slower.
0:06:08.2	T	Slower. So we're going to go ahead and fill that out.
0:06:11.6	SN	Do you just want us to circle slower?
0:06:13.2	T	No, write it on the line, please.
0:06:17.2	T	And then we decided that the speed of Ramp 2, or the higher the ramp, it was ...
0:06:21.3	SS	Faster.
0:06:22.2	T	Faster.
0:06:27.2	T	OK.
0:06:34.4	T	All right. So I have another handout for you. We're going to do this experiment. We're going to add another piece to the experiment. So let me hand this out to you.
0:06:56.4	T	And I have a couple more things I need to hand out to you. There you go.
0:07:07.7	T	Here you go.
0:07:12.2	T	So go ahead and take a look at this paper, and I'll finish handing out the rest of the supplies that you need for this.
0:07:21.9	T	Read through this paper, please, so that you understand what we're doing next.
0:07:27.8	T	So take a minute ... Ladies and gentlemen, take a minute and read through the paper that I just handed out that says "High-Speed Energy."
0:07:37.5	T	You should each have your own copy. Please read through your ... copy of ...
0:07:51.7	SN	Those look like [inaudible].
0:07:53.6	T	Christian, what did I ask you to do?
0:07:55.8	S	Sorry.
0:07:56.5	T	Read through the instructions and the procedures for the next step so that you know exactly what you're going to be doing.

Video Clip 2f

Time Code	Speaker	Discussion
0:08:06.8	T	So ...
0:08:07.3	SN	Slow one.
0:08:07.7	T	here's my question for you. This packing peanut sitting right here at the end of this ramp.
0:08:12.6	SN	Does it have energy?
0:08:13.5	T	Does it?
0:08:14.2	SS	No.
0:08:14.3	SN	Not yet, until the marble hits.
0:08:16.1	T	So why do you say it does not have energy?
0:08:18.2	S	Because look, the marble's the one that has the energy, and it's—
0:08:21.1	SN	And it's ... it's giving the ener ... energy to the peanut.
0:08:23.4	T	So the marble is giving the packing peanut its energy. OK?
0:08:29.3	SN	[Inaudible]
0:08:31.1	T	OK.
0:08:31.2	SN	Lookit.
0:08:31.8	T	So you only have to do it three times. So are you good?

Video Clip 2g

Time Code	Speaker	Discussion
0:08:37.3	T	... like this group up here had 14 centimeters, so I'm going to go ahead and use them as my group to ... to mark. So we're going to label that as 14 centimeters. OK.
0:08:50.3	T	You're going to do the same thing with the block of wood now. Now please make sure ... We need to make sure that we're all consistent with our variables.
0:09:02.7	T	So we need to decide, does our block ... Is it more stable this way or more stable this way?
0:09:09.3	SN	The bottom.
0:09:09.7	SN	This way.
0:09:10.2	SN	The first way.
0:09:10.5	T	Flat. OK. So you're going to set up your ramp just like you did the first time. You need the second piece of white paper.
0:09:19.1	T	Set everything up the same way, and I'll come around with another piece of tape.
0:09:22.3	SN	Actually, Ms. Bernstein ...