Transcript for Video Clip 7.1

Teacher/video ID:	Michelle Bernstein, 7.1_stella_et_bernstein_L3_c1
Content area:	Energy transfer
STeLLA strategy:	Select content representations and models matched to the learning goal and engage students in their use (SCSL strategy D).
Context:	In this lesson on energy transfer, the teacher reads a story to the class about a collision of two boys (Mumford and Leroy) on their bicycles. Then students set up a model (content representation) of the collision using two marbles, two rulers, and a block of wood to explore what happens to energy when two objects collide.

Video Clip 1a

Time Code	Speaker	Discussion
0:00:01.3	T	All right. So let's read this story together.
0:00:10.6	T	All right. So, part 1.
0:00:13.8	T	It was a bright, warm spring morning when Mumford hopped on his bicycle to meet up with friend Leroy for a day of adventure.
0:00:20.7	T	His dog, Spots, was coming along and ran joyfully beside Mumford. He rode to the big hill that was between his house and Leroy's.
0:00:29.2	T	Mumford stopped just before heading down the hill. This was his favorite part of riding to Leroy's house.
0:00:36.4	T	With just a little push, his bicycle would pick up speed faster and faster as he rode down the hill.
0:00:42.9	T	Mumford could see Leroy waiting on his bicycle at the bottom of the hill.
0:00:47.3	T	He decided he would let his bike coast right by with all the speed he picked up on the way down the hill and let Leroy catch up if he could.
0:00:58.1	SN	Uh-oh.
0:00:58.4	T	Just as Mumford took off, Spots started barking. A squirrel or a cat must have caught his eye.
0:01:06.8	T	Mumford took his eyes off the road to figure out why Spots was making so much noise.
0:01:12.5	T	Mumford wasn't watching where he was going and didn't realize he wasn't … he was on a collision course headed straight for his pal Leroy.

Video Clip 1b

Time Code	Speaker	Discussion
0:01:26.1	T	So we're going to recreate the crash. So in your bag on your table, you have two rulers.
0:01:37.0	SN	Oh, that's nasty.
0:01:40.4	T	A block of wood.
0:01:42.1	SN	He lost a tooth.
0:01:44.6	T	Just put it in your pocket for right now, and we'll take care of it in a minute.
0:01:47.0	SN	I … I took … washed my mouth—

0:01:48.2	T	Put it in your pocket in just a minute. Let me give instructions; then you can take care of that, OK?
0:01:52.4	T	All right. You have a block of wood, which you're used to, two marbles—one is going to be Mumford; one is going to be …
0:02:01.9	SN	Leroy.
0:02:02.3	T	Leroy. And I want you to set up your rulers so that you have a track. So this is like your hill. Remember we said that the marbles roll down the groove that's in the track.
0:02:13.9	T	I want you to set up an experiment to prove some of our ideas.
0:02:21.3	T	We've had some people say, "Oh, it's not really going to be that big of a deal because they're just going to hit, and they're both going to stop."
0:02:27.4	T	Or "Mumford's moving fast, and so he's going to hit, and then Leroy's going to move."
0:02:34.4	T	So what I need for you to do is take and set up one ramp.
0:02:41.4	SN	[Inaudible]
0:02:42.0	T	Please listen for just a minute, guys.
0:02:44.7	T	You're going to set up one ramp, and it's going to look similar to what Lexie's group has already kind of set up here.
0:02:51.4	T	So you're going to set up one ramp with the two rulers. You're going to have one marble that's going to be Mumford, [and] one that's going to be Leroy.
0:03:01.2	T	And you are going to write a plan in your notebook. What is your plan going to be? How are you going to prove what you think to be true? OK?
0:03:16.3	T	And then you need to make a data table to record your findings, OK? So the …

Video Clip 1c

Time Code	Speaker	Discussion
0:03:28.0	SN	When he … because the packing peanut rolled, it didn't just move.
0:03:32.5	T	OK.
0:03:32.6	S	And the marble's going to roll, so wouldn't you think he would kind of roll? Like if he got hit—
0:03:37.1	SN	I don't think he'd roll—
0:03:37.7	T	No, remember, this isn't an … exactly a bike experiment. But it's going to give us the same idea and concept.
0:03:43.8	T	We have someone down here that's stopped. He's waiting, right? He's at the bottom of the hill.
0:03:50.1	T	And when that other guy, Mumford, starts at the top of the hill, remember, he knows that when he goes to the top of that hill, he's going to do what when he goes down?
0:03:56.9	SN	Slide down real fast.
0:03:57.7	T	He's going to go really fast. So with that information, what's going to happen when Mumford hits Leroy?
0:04:06.9	S	[Inaudible]

0:04:07.1	T	What … what's Mumford going to do? What's Leroy going to do?
0:04:10.0	SN	He's …
0:04:11.0	T	So …
0:04:11.4	S	Mumford's going to stop, and Leroy's going to roll.
0:04:13.5	T	OK, so try it and see what happens.
0:04:15.7	SN	See, he rolls.
0:04:17.3	SN	But …
0:04:17.5	T	OK.
0:04:18.0	S	but this is not exact. This is marbles. They still roll.
0:04:20.8	T	Now remember, this is … this is just a model. Can we replicate things exactly?
0:04:25.1	SN	No, but they're kind of four items, if you think about it.
0:04:27.0	T	OK. So remember, this is just a model to give us an idea of what we expect to see.
0:04:34.4	T	So when we first think about it, he's not moving at all. Mumford is.
0:04:42.7	T	So what's happening …
0:04:46.0	SN	The impact.
0:04:46.1	T	to cause him to move?
0:04:47.8	S	The impact of this marble is going …
0:04:49.8	T	OK.
0:04:50.0	S	into that marble and making that marble move. So it's making it roll.
0:04:52.8	SN	Hitting these … the— OK, so watch. If we put this up here without him, he goes fast.
0:05:00.3	T	So if there's nothing blocking his way, he moves freely about his day.
0:05:03.1	S	He moves fast.
0:05:04.2	T	OK.
0:05:04.6	SN	Based on the block.
0:05:05.2	SN	And then he slows down.
0:05:05.7	SN	Wait.
0:05:06.7	SN	He slows down. Plus it was already mov … it was already moving, anyways, so …
0:05:10.6	T	But did he move as fast as he did when there was nothing blocking his way?
0:05:14.1	SN	No.
0:05:14.4	T	So what happened to that energy?
0:05:16.0	SN	Ooh. He gave some of his energy to the other marble, so the other marble can move.
0:05:19.8	T	OK. So what you need to do now is you need to write up your plan for how to prove this. How are you proving this? What's your plan?
0:05:27.2	T	And then you need to give me some sort of data table that shows what happens between Marble 1 and Marble 2 at the beginning, at the middle, and at the end. OK?

0:05:36.6	T	So go ahead and take care of that. You guys are on the right track, so I just need your plan and your data table.
0:05:41.5	SN	How do you make a data table?

Video Clip 1d

Time Code	Speaker	Discussion
0:05:46.5	T	So in order to do this in a safe way, we have a model.
0:05:52.4	T	It doesn't matter, really, if he's at the side or if he's facing him or if he's facing away from him. What's going to happen?
0:06:00.6	T	Any time that somebody with collides with someone, what's going to happen?
0:06:05.3	SN	They're going to … someone's going to lose speed; the other's going to gain a little speed.
0:06:09.2	T	Yeah.
0:06:09.5	S	And they're going to spread apart.
0:06:11.4	T	There's going to be some transfer. Somebody said it a little while ago … Some transfer, some kind of energy.
0:06:16.9	T	OK, somebody's going to cause somebody else to move if they hit one another. OK?