

Transcript for Video Clip 6.4

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Content area:	Food webs
STeLLA strategy:	Select activities that are matched to the learning goal (SCSL strategy C).
Context:	Prior to this video clip, students examined data from Jan van Helmont’s historic experiment, which showed that a tree gained 164 pounds over five years, but the soil in the bucket lost only 2 ounces. In this clip, students try to make sense of this data.

Video Clip 4

Time Code	Speaker	Discussion
0:00:01.4	T	And I would like to hear from your ideas. Here’s another picture, so we have—
0:00:07.9	SN	Those trees are tall.
0:00:09.6	SN	Is that from, like, that [inaudible]?
0:00:10.9	T	It’s not quite five years, but this could be a before-and-after over the same amount of time.
0:00:16.2	T	So how does this data either support that soil is food for plants—and we need to add to our chart—or how does it challenge that idea?
0:00:28.2	T	I have four hands, but I heard a lot of really good conversation happening. How does that either—
0:00:32.3	SN	There’s five hands.
0:00:33.5	T	support or challenge it? Kevin?
0:00:38.2	SN	Well, I’m kind of questioning if trees need soil to survive, because in 3rd grade, in my class, we did an experiment to see if that was true, and we took a plastic bag and put a plant seed in there.
0:00:53.1	SN	Oh—
0:00:53.3	SN	And just filled it with water.
0:00:53.4	S	And we watered it.
0:00:53.8	SN	I remember that.
0:00:54.9	T	Mm-hm.
0:00:55.6	SN	And it still came out of the seed, and it still grew.
0:00:59.9	SN	But ... but slowly it would die.
0:01:01.1	T	So, Kevin, what would that ... what does that tell you that helps answer this question? Is that evidence to support or evidence to challenge?
0:01:10.5	SN	Challenge.
0:01:11.4	T	OK.
0:01:11.9	SN	I think it would be ...
0:01:12.2	T	And so why does that ... why does that challenge the idea that soil is food for a plant?

0:01:16.2	S	Well, I think soil is food, but I'm just not sure if they need it to survive, like we don't—
0:01:20.3	SN	Soil could be, like, ice cream.
0:01:21.2	SN	need fish to survive. There's a lot of other kinds of—
0:01:24.4	SS	[Inaudible]
0:01:25.7	T	Hmm. Thank you for raising your hand and not calling out. Teagan, I want to hear your idea. We haven't heard you yet. Yes?
0:01:30.7	SN	'Cause we just put it [a seed] in a bag with just a wet paper towel, and just put the seeds in there with the ... nothing else in there, and it just grew.
0:01:41.8	SN	It didn't grow. In my class, [the seeds] didn't grow.
0:01:44.5	T	So, Kevin, I want you to write that down as evidence to challenge. And I want you to put it next to soil back there, because you had a plant sprout and start to grow without soil.
0:01:53.4	SN	I think [inaudible] it only had a wet paper towel.
0:01:56.2	SN	I think—
0:01:56.7	SN	and every time the paper towel kept getting drier.
0:01:59.4	SN	I think soil might be like ice cream. Like, it's like ... It's not a must-have; it's not a necessity, but it's, like, just a treat.
0:02:07.9	SN	The what?
0:02:08.4	SN	It [the soil] kind of helps [plants] to grow better.
0:02:10.5	T	OK.
0:02:10.9	SN	Ice cream doesn't help you grow.
0:02:11.7	T	So would that be—
0:02:12.9	SN	It does.
0:02:14.4	T	evidence to support that soil is food?
0:02:17.8	SN	Yeah.
0:02:18.9	T	OK. Write that down and add it to our chart. Sienna?
0:02:22.6	SN	I think soil is more of a stabilizer so the tree doesn't fall over.
0:02:27.6	SN	Yeah, that's what I was thinking.
0:02:28.9	T	So you think soil might play a totally different role than food.
0:02:33.8	S	Mm-hm.
0:02:34.7	T	Do you have evidence to support that?
0:02:38.2	S	'Cause I have a pretty good idea that the mass of the tree would fall over if it's just sitting on the ground.
0:02:44.9	T	OK. So you're using that idea of a tree. What about this?
0:02:48.0	T	We have evidence here. Someone conducted— We don't have five years for it, so we can't run this investigation, but somebody already did it for us.
0:02:54.9	T	So we have data to help us answer this question. We just have to figure out what the data is telling us.

0:03:03.5	T	What do you think, Grace?
0:03:05.1	SN	Well, my question is, Does soil have, like, Calories and energy?
0:03:09.5	SN	Mm-mm, mm-mm.
0:03:11.2	T	That's a good question. So are you thinking that would help us be able to define it?
0:03:15.6	SN	Yeah.
0:03:19.7	T	Mm-hm. I think ... if we think about the plant food yesterday, plant food contains a lot of the same materials that the soil has.
0:03:29.8	T	So what did you decide about plant food yesterday?
0:03:33.3	SN	I don't think it has Calories.
0:03:35.1	T	What did you decide about the plant food yesterday? Was that a food or not a food?
0:03:39.0	S	It wasn't a food.
0:03:39.8	T	Emmy?
0:03:40.7	SN	Not a food.
0:03:41.3	T	Not a food. Why not?
0:03:42.9	S	Because it didn't have any energy. Or, well, Calories, I think.
0:03:47.5	T	So since plant food and soil contain a lot of the same materials, Grace, would that support or challenge the idea that soil is food for plants?
0:04:03.2	SN	Challenge?
0:04:04.4	T	Why would it challenge that idea?
0:04:10.1	S	I don't know.
0:04:12.3	T	Does someone want to help out Grace?
0:04:13.4	T	Why would it ... why would ... If soil isn't ... if soil and plant food are not food according to our scientific definition from yesterday, how would that challenge the idea? Kyle?
0:04:25.5	SN	It would challenge it because food has the sa ... scientific definition, the food ... food has to have Calories and mass and plant ... plant food in the ... plant food in soil [has] mass.
0:04:41.5	S	But on the chart, it said plant food doesn't have Calories, so that doesn't make it a food.
0:04:48.1	T	OK, so it doesn't have Calories. If the plant got everything that it needed to grow, if it was getting matter and energy from the soil...
0:05:02.5	T	This is a small pot. Could this get more soil from the world around it?
0:05:08.4	SN	Mm-mm.
0:05:08.5	SN	Mm-hm.
0:05:09.4	T	It could? This pot could?
0:05:10.8	SN	Mm-mm.
0:05:11.5	T	In this experiment?
0:05:12.8	S	No.
0:05:13.2	T	So over five years, if this is all the soil it had, [and] no more was added ... this tree

		needed food to grow.
0:05:23.3	T	Did this tree get all of the matter and energy it needed to grow from that soil in the pot?
0:05:29.4	SS	No.
0:05:30.4	SN	No, it needed more than the soil.
0:05:31.3	SN	It needed sunlight and water. That's it ... basically—
0:05:35.8	SN	Soil doesn't have—
0:05:36.6	SN	it. What they need is water and sunlight, and not really soil.
0:05:42.2	T	So what we're trying to do as scientists is look at one variable at a time. So right now, the only variable we're looking at is soil.
0:05:49.8	T	Based on this data, did the tree get what it needs to grow from the soil?
0:05:58.1	SN	No.
0:05:59.5	T	How do we know, based on this data?
0:06:02.4	S	'Cause it didn't grow right.
0:06:05.3	T	It's a tree. How do we know? Raise your hand without shouting out. How do we know, using this data, whether or not the soil is food? Andrew?
0:06:16.0	T	I need you to be filling this out as we go.
0:06:20.3	SN	The, uh, soil ...
0:06:21.8	T	Mm-hm.
0:06:22.8	S	it ... it only lost two ounces.
0:06:27.3	T	Mm-hm.
0:06:27.7	S	but the tree gained 164 pounds. And so you ... you can't really ... it's not really a kind of fair trade-off, I guess.
0:06:43.4	T	So it isn't an equal trade-off?
0:06:45.3	S	Yeah.
0:06:45.8	T	So the tree is much bigger, has much more matter, and the soil only lost a little bit of matter.
0:06:54.6	T	Kyle?
0:06:57.2	SN	Since the tree's gaining, like, over 160 pounds ...
0:07:03.2	T	Mm-hm.
0:07:03.6	S	and that's a lot, but the soil lost, like, two ounces,
0:07:10.8	T	Mm-hm.
0:07:11.6	S	I think that's saying that the tree didn't get any, like, didn't get much stuff from the soil because it was in a pot, and it [the soil] only ... it only lost two ounces.
0:07:29.6	S	So I don't think that soil helped it grow. I think it was something else that did.
0:07:34.3	T	OK. So ...