Variations in Plants and Animals
Supplemental Math Lesson 1: Measuring Variations in the Traits of Sunflowers

Grade 1	**Length of lesson:** 48 minutes	**Placement of lesson in unit:** 1 of 2 supplemental math lessons on variations in plants and animals (sequence between lessons 2a and 2b)
Unit central question: How do differences (variations) in plants or animals of the same kind help them survive so they can produce young (babies or seeds)?		**Lesson focus question:** How can we use evidence to show that sunflowers are not all alike even though they're all sunflowers?
Main learning goal: The traits of individuals of the same kind of plant or animal can vary, and some of these traits can be measured.		
Science content storyline: Plants of the same kind, such as sunflowers, have traits that make them similar to one another. All sunflowers have roots, stems, leaves, flowers, and seeds. However, the traits of individual sunflowers, such as petal color, stem length, and seed size, can vary. We can observe, describe, compare, and measure some of these variations. When we measure trait variations in sunflowers, we collect more precise evidence (data) so we can document these variations.		
Ideal student response to the focus question: If we look carefully, we can see that sunflowers aren't exactly the same. For example, the petals and seeds of sunflowers aren't all the same color, some sunflowers are taller than others, and some sunflower seeds are bigger than others. We can describe the differences or variations in sunflowers, but it's better to measure the traits if we want to collect the best evidence. Then we can use our measurements to show exactly how much taller one sunflower is than another sunflower.		

Preparation

Materials Needed
- Student notebooks
- Chart paper and markers
- Class chart of sunflower traits and variations (from lesson 2a)
- A variety of sunflower seeds in plastic zip-seal bags (1 bag per pair)
- Set of linking cubes or other nonstandard measuring tool (1 per pair) (See Ahead of Time)

Student Handouts and Teacher Masters
- 1.1 Sunflower Posters (1 set of 3 posters for every 6 students and 1 set as a teacher master)
- 1.2 Trait Variations in a Sunflower—Data Table (1 per student)

Ahead of Time
- Review the content background document.
- Determine the nonstandard measuring tools you want students to use to measure the life-size posters of sunflowers, such as linking cubes, pencils, a laminated nonstandard measuring tool, or a predetermined length of string. Before you begin the activity, have students practice measuring other objects in the classroom with their measuring tools and tell them to measure the sunflowers the same way.
- **ELL support:** Meet with ELL students in advance and introduce them to the lesson content, structure, materials, and activities so they know what's expected of them and can participate more fully in the lesson. Gather visual resources for the keywords *measure, measurements*, *length*, *data, data table*, and *evidence.* Review these words and their meanings in advance. Also review the words *accurate*, *survive*, *survival*, and *environment*.

Lesson 1 General Outline

Time	Phase of Lesson	How the Science Content Storyline Develops
5 min	**Link to previous lesson:** The teacher engages students in reviewing the sunflower traits and variations they observed in the previous lesson. Then students consider what a scientist might do to learn more about trait variations in plants.	• The traits of individual plants of the same kind can vary, and we can observe these variations.
1 min	**Lesson focus question:** The teacher introduces the focus question, *How can we use evidence to show that sunflowers are not all alike even though they're all sunflowers?*	
10 min	**Setup for activity:** Students examine a variety of sunflower seeds and identify similarities and differences (variations) in their traits. Then students discuss how they could show variations in the size trait in a scientific way.	• Sunflower seeds vary in color, shape, and size. We can provide evidence of these variations by comparing the seeds.
15 min	**Activity:** Using nonstandard units of measurement, students work in pairs to measure the trait of stem height (length) in three sunflower plants. Then they record their measurements on a handout, and the teacher records them on a class data table.	• The traits of individual sunflowers vary in many ways. We can measure some of these variations, such as stem height (length), flower width, and leaf length.
10 min	**Follow-up to activity:** The teacher discusses the concept of models with the class. Then students compare and analyze the data they collected for the three sunflower plants. The teacher links the results to variations in traits, and students consider whether variations in stem height might give sunflowers a survival advantage.	• The traits of individual sunflowers vary in many ways. We can measure and record some of these variations, such as stem height (length), flower width, and leaf length. Then we can use this data to compare variations in sunflower traits and show exactly how much taller, bigger, or longer one sunflower is than another.
6 min	**Synthesize/summarize today's lesson:** In their science notebooks, students draw and label variations in one sunflower-seed trait they observed. Then the teacher revisits the focus question, and students use evidence from their sunflower investigation to answer it.	• The traits of individuals of the same kind of plant or animal can vary, and we can observe and measure these variations.
1 min	**Link to next lesson:** The teacher announces that in the next math lesson, students will construct a bar graph to help them compare and describe the data they collected on trait variations in sunflower plants.	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
5 min	**Link to Previous Lesson** **Synopsis:** The teacher engages students in reviewing the sunflower traits and variations they observed in the previous lesson. Then students consider what a scientist might do to learn more about trait variations in plants. **Main science idea(s):** • The traits of individual plants of the same kind can vary, and we can observe these variations.	Ask questions to elicit student ideas and predictions.	**Show slide 1.** In our last lesson, we investigated how sunflower plants are alike and different. What science word do we use to describe how plants are alike? What science word do we use to describe how plants are different? **Show slide 2.** How are sunflowers alike? What are some of the traits we observed? **NOTE TO TEACHER:** *Keep this review brief. Display the class chart of sunflower traits and variations from lesson 2a and encourage students to use it as a resource.* Do all sunflowers share these traits?	Trait. Variation. Sunflowers have leaves. Leaves are a trait that sunflowers share. Another trait they have is stems. Sunflowers have flowers and seeds. Sunflowers have roots too, but we didn't see them in our sunflowers. Yes! Because these are	Can you say this using the word *trait*? How do you know?

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			What differences or variations did we observe in sunflower traits?	the traits that make them sunflowers! Sunflowers have different flower colors. Sunflowers have variations in their flower colors. The stems are different lengths. The flowers are different sizes. They have different-shaped leaves. Some of the plants have more leaves than other plants.	Can you use the word *variations*?
			Do these variations make sunflowers alike or different?	These variations make sunflowers different.	
		Link science ideas to other science ideas.	So last time, we identified traits that make sunflowers alike, and we identified differences in traits from one plant to another. These differences are called *variations*. **Show slide 3.** How could we show these variations in sunflower		

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			traits in a more scientific way? What might a scientist do to learn more about the differences or variations in sunflower traits?	A scientist might take pictures of sunflowers.	What would a scientist do with the pictures?
				A scientist might write about the differences in a notebook.	Why do you think a scientist would write about the variations?
				Maybe a scientist would measure the sunflower plants.	Say more about measuring. Why would a scientist measure the plants?
			You've come up with some interesting ideas about how scientists might learn more about variations in sunflower traits. Today we'll work like scientists to collect more evidence about variations in sunflowers. First, we'll compare some traits, and then we'll make careful measurements of those traits. That will make our evidence even stronger! **ELL support:** During the lesson preview, discuss what evidence is and provide examples of different kinds of evidence so that ELL students will		

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			understand what to look for. You may also want to include examples of weak and strong evidence if you plan to introduce this concept during the lesson.		
1 min	**Lesson Focus Question** **Synopsis:** The teacher introduces the focus question, *How can we use evidence to show that sunflowers are not all alike even though they're all sunflowers?*	Set the purpose with a focus question or goal statement.	**Show slide 4.** Our focus question for today will help us think like scientists: *How can we use evidence to show that sunflowers are not all alike even though they're all sunflowers?* Write this question in your science notebooks and draw a box around it. **NOTE TO TEACHER:** *Write the focus question on the board for students to refer to throughout the lesson.* **ELL support:** To explicitly emphasize that all sunflowers aren't exactly alike, you might want reword the focus question for ELL students: "What evidence can we use to show that all sunflowers aren't exactly alike?"		
10 min	**Setup for Activity** **Synopsis:** Students examine a variety of sunflower seeds and identify similarities and differences (variations) in their traits. Then students focus on the size trait and	Link science ideas to other science ideas.	**Show slide 5.** Next, we'll look at some sunflower seeds and see how they're alike and different. **NOTE TO TEACHER:** *Have students pair up with an elbow partner. Then give each pair a plastic bag containing a variety of sunflower seeds. Have students carefully pour the seeds onto a sheet of notebook*		

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
	discuss how they could show variations in the size trait in a scientific way. **Main science idea(s):** • Sunflower seeds vary in color, shape, and size. We can provide evidence of these variations by comparing the seeds.		*paper and then examine the seeds closely. Encourage students to pick up the seeds and touch them. Have them look for similarities and differences among the seeds and record their observations in their notebooks. Students may work individually first and then share with a partner, or they may work in pairs during this setup activity.* **CONTENT NOTE:** *What we typically call sunflowers seeds (with the hard, outer coat) are actually sunflower* fruits, *with the softer, edible seed inside. We use the term* seed *in this sequence of lessons because students are more familiar with it, but you should point out to students that what they're observing is actually the sunflower* fruit*, not the seed. The seed is inside the fruit (or shell).* **Show slide 6.** Pour the sunflower seeds onto a blank sheet of notebook paper and look at them closely. How are the seeds alike? How are they different? **Turn and Talk:** Share your observations with your partner. Then record them in your science notebooks. **Whole-class share-out:** Who can describe how the sunflower seeds are alike? What traits did you find? **NOTE TO TEACHER:** *Invite students to briefly share the similarities and differences they observed, including the color, size, and shape of the sunflower seeds. As students share their observations, record them on chart paper. Ask questions to clarify and challenge student thinking.*		
		Engage students in analyzing and interpreting data and observations. Ask questions to elicit student ideas and		The seeds are shaped kind of like an oval. The shape of the seeds. All of the seeds are	What trait are you describing? Can you say more about this trait?

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
		predictions. Ask questions to probe student ideas and predictions. Ask questions to challenge student thinking. Highlight key science ideas and focus question throughout. Engage students in communicating in scientific ways.	*Use the words* traits *and* variations *as much as possible during the discussion and encourage students to use them as well. For example, you might ask, "What variations in the color trait of the sunflower seeds do you notice?" If time allows, you could also ask students to look closely at the seeds that are more alike, such as only the striped seeds or only the black seeds. Then ask, "Do all of these seeds look exactly alike, or do they have variations too?* *During this discussion, encourage students to listen carefully to their classmates' ideas and be ready to agree or disagree, add on, or ask questions.* STOP Listen to students' ideas. What's visible about student thinking? Are they using the terms *trait* and *variations* correctly? **ELL support:** Note any ideas that can be used as a basis for developing collaborative understandings. How are the sunflower seeds different? What variations did you find?	small. The size of the seeds. I think the striped seeds are a little bit bigger. Variations. Some seeds have stripes. Some seeds are black, and some are white. The color of the seeds.	What trait are you describing? Any other ideas? So you think the size of these seeds is different? What do we call differences in traits? Which trait are you describing? Tell me more about the variations in this

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
					trait.
			Let's talk some more about the size trait in sunflower seeds. Do you think all sunflower seeds are the same size, or are they different sizes?	I think they're all the same size because they're all small.	Does anyone disagree or have something to add?
				I disagree. The seeds aren't exactly the same size. The striped seeds look bigger and rounder.	Say more about "bigger and rounder." Do you mean wider or taller or both?
			Look at your sunflower seeds more closely. What do you notice about the size? **NOTE TO TEACHER:** *To enhance students' math skills, consider having pairs count the number of small, medium, and large seeds. Then ask, "Are there more large or small seeds?" Have students indicate how many seeds of each size they have and whether they have more of a certain size (e.g., "I have six large seeds and three small seeds, so I have more large seeds than small seeds" or "I have three more large seeds than small seeds").*	Some are bigger, some are medium sized, and some are smaller.	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			Show slide 7. As a scientist, how could you show that some seeds are bigger and some are smaller? **ELL support:** Consider using visual representations of size words to help ELL students describe size differences. This would also be a good place to highlight comparative words in English, which are expressed differently in languages like Spanish. **NOTE TO TEACHER:** *If students don't mention it, suggest that they could line up the seeds side by side from smallest to largest, or vice versa, on a sheet of notebook paper. If they place one end of each seed along the same line on the paper, they can make a more accurate comparison.* **ELL support:** Consider having ELL students pair up and discuss different strategies for showing variations in seed size. This will help them build collaborative understandings. Remember that scientists like to collect as much evidence as they can when they're studying something. Because these sunflower seeds aren't very large, it would be hard for us to measure them, but we can *compare* the size of the seeds to provide evidence that some are larger and some are smaller. How do you know that some sunflower seeds are larger than others? What evidence do you have? **NOTE TO TEACHER:** *At this point, you might have*	I could draw pictures of them. We could put the seeds next to each other and take a picture. We could put the seeds on top of each other. One seed goes higher above the line on my paper.	Tell me about the pictures you would draw. Say more about putting seeds on top of each other. What do you
		Highlight key science ideas and focus question throughout.			

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			students arrange the seeds on a sheet of paper from smallest to largest and then tape them onto the page so they can display their evidence. Alternatively, have students walk around the room in pairs and observe other students' papers with the seeds arranged from smallest to largest. **Show slide 8.** One way we can gather evidence of variations in a trait, like the size of sunflower seeds, is by *comparing* that trait in different plants. But we can be even more accurate if we *measure* a trait. Comparing and measuring traits are two ways we can gather evidence of variations. That's what we'll do next.	I put the seeds side by side on the paper, and I can see which ones are larger.	mean by "higher"?
15 min	**Activity** **Synopsis:** Using nonstandard units of measurement, students work in pairs to measure the trait of stem height (length) in three sunflower plants. Then they record their measurements on a handout, and the teacher records them on a class data table.	Highlight key science ideas and focus question throughout. Make explicit links between science ideas and activities **before** the activity. Ask questions to elicit student ideas and predictions. Make explicit	**Show slide 9.** **NOTE TO TEACHER:** *In addition to the slide, display the three sunflower posters from handout 1.1.* How could we compare these three sunflower plants? What could we do to collect the best possible evidence about their variations? Yes, we could collect evidence by measuring each plant! For today's investigation, you'll work in pairs to	We could measure them.	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
	Main science idea(s): • The traits of individual sunflowers vary in many ways. We can measure some of these variations, such as stem height (length), flower width, and leaf length.	links between science ideas and activities **during** the activity. Select content rerpresentations and models matched to the learning goal and engage students in their use.	measure one sunflower trait using a special measuring tool. I'll assign each pair a different sunflower to measure. Then you'll record your measurement on a handout, and we'll share our results for all three sunflowers as a class. **NOTE TO TEACHER:** *Have students pair up with an elbow partner. Then introduce the nonstandard unit of measurement you want students to use for this activity and distribute the measurement tools to each pair. Have students practice measuring other objects before you begin the activity so they understand how to measure the sunflowers. (See note in Ahead of Time on the overview page.)* *Distribute one set of three sunflower posters to three pairs of students so that each pair has a different poster. Then give each student a copy of handout 1.2 (Trait Variations in a Sunflower—Data Table) and show students where to record their measurements (evidence).* *If you aren't confident in students' measurement skills, measure the dimensions of one sunflower plant together as a class. Ask one or two students to help you measure the length of the stem (height) and engage the whole class in the process. Then distribute the two remaining posters for pairs to measure. If you use this alternative approach, only measure one of the plants as a class, not all three plants.* What do you notice about these three posters of sunflowers? **ELL support:** Encourage ELL students to ask	Each sunflower is a different size.	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			questions during the class discussion. This will help them process what they're being asked to do. Before we measure our sunflowers, let's practice using our measurement tools and measure some other objects around our classroom. **NOTE TO TEACHER:** *Give students 1 minute to measure different objects using their tools. Make sure they understand how to use the unit of measurement correctly.* **Show slide 10.** Now I'd like you and your partner to use your measuring tool to measure the length of the stem on. This is the same as measuring the height of the plant. Measure the length of the stem at least twice to make sure your measurement is correct. Then each of you should record the measurement on your handout. If you're measuring Sunflower 1, record your measurement in the first column of the handout that says "Sunflower 1." If you're measuring Sunflower 2, record your measurement in column 2. And If you're measuring Sunflower 3, record your measurement in column 3. Raise your hand if you have any questions, and I'll come to you. **Pairs work time.** **NOTE TO TEACHER:** *If time allows, or if some pairs finish before others, have pairs measure the*		

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			flower width of their sunflower and possibly the length of a leaf and record the data on their handouts. For the smaller dimensions, students could use linking cubes, or to avoid the problem of uneven measurements (e.g., 3 1/2 or 3 3/4), a good alternative might be using a string that's half the length of the smallest flower. **Show slide 11.** **Whole-class:** Now I'd like each pair to tell me your stem-length measurements, and I'll record them on a class data table. Then we'll compare the measurements for all three sunflowers and talk about the differences or variations we find. **NOTE TO TEACHER:** *Display handout 1.2 (Trait Variations in a Sunflower—Data Table) on a document reader and record stem-length measurements for all three sunflowers on the data table. Alternatively, create a class chart using the handout as a model and record the measurements on this chart.* *The results don't have to be exact, but if some stem-length measurements are way off, have those pairs remeasure their plants and check the results with another pair of students whose measurements were more accurate. Tell students that scientists often measure more than once just to make sure their results are as accurate as possible.*		
10 min	**Follow-Up to Activity** **Synopsis:** The teacher	Select content	**Show slide 12.** Before we look at our measurements, let's talk about		

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
	discusses the concept of models with the class. Then students compare and analyze the data they collected for the three sunflower plants. The teacher links the results to the variations in traits, and students consider whether variations in stem height might give sunflowers a survival advantage. **Main science idea(s):** • The traits of individual sunflowers vary in many ways. We can measure and record some of these variations, such as stem height (length), flower width, and leaf length. Then we can use this data to compare variations in sunflower traits and show exactly how much taller, bigger, or longer one sunflower is than another.	representations and models matched to the learning goal and engage students in their use. Highlight key science ideas and focus question throughout. Ask questions to elicit student ideas and predictions.	our sunflower posters for a minute. Are these sunflowers real? So these are pictures of sunflowers, not actual sunflowers. Scientists call these *content representations* or *models* of the real thing. They represent the real thing, but they aren't the real thing. **Show slide 13.** Why do you think scientists use models rather than the real thing? Why do you think we didn't try to measure real sunflowers in our classroom? Those are interesting ideas! **Show slide 14.**	No. They're made out of paper. They're pictures of sunflowers. Because maybe they could hurt or damage a real thing? Maybe because real things are hard to get. Maybe sunflowers aren't really this big. It's easier to lay the poster on the floor to measure it. Real sunflowers aren't always that straight.	

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
		Summarize key science ideas.	So models represent real things, but they aren't the real things. Scientists often use models to learn about things that are too difficult or dangerous to study up close, or maybe because the real thing is too hard to find. Sometimes an object is too far away to study up close, like a planet, or it's too small, like a drop of water. We decided to use models of sunflowers in this activity because it's more practical than using real sunflowers. Besides being hard to find, real sunflowers wouldn't last very long because they'd wilt. **Show slide 15.**		
		Engage students in analyzing and interpreting data and observations. Make explicit links between science ideas and activities **after** the activity.	Now let's look at the data we collected from measuring our sunflower plants. What do you notice about our measurements?	Our numbers aren't all the same. Some of us measured right, and some of us measured wrong.	Tell me how the numbers are different. How will we know if the numbers are right or wrong? Do you have any ideas about what

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			What do our measurements tell us about the stem-length or height trait of the sunflower plants?  Listen to students' ideas. What's visible about student thinking? **Show slide 16.** Let's complete some sentences to help us compare our sunflower measurements: *The height of Sunflower 1 is [more than/less than] the height of Sunflower 2.* *The height of Sunflower 2 is [more than/less than] the height of Sunflower 3.*	The sunflowers aren't the same height. The measurements are different for each sunflower. One sunflower is tall, one is short, and one is in the middle. Variations.	we could do to get more accurate results? How do you know the sunflowers aren't the same height? When traits aren't exactly the same, what do we call that? What science word do we use?

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			The height of Sunflower 3 is [more than/less than] the height of Sunflower 1. Do we all agree that there are variations in the stem-length or height trait of our sunflower plants? How do you know? What is your scientific evidence? So we can use our measurements as evidence that sunflowers aren't exactly alike even though they're all sunflowers. Another way to say this is that we can use our measurements as evidence that sunflowers have variations in their traits. **Show slide 17.** Here's another question to think about: Do you think that variations in the stem-length or height trait give a sunflower a better chance of surviving in its environment? For example, will a taller sunflower be more likely to survive than a shorter one? Why or why not?	We can see the differences when we put the sunflowers side by side. When we measured all of the sunflowers, the tall sunflower had the biggest number.	Can you use the word *variations* in your answer? What do you mean by "biggest number"?

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			Great job, everyone! Now let's draw some pictures to show what we learned today about variations in sunflower traits.	I think that taller sunflowers have a better chance of surviving because they're closer to the Sun. Short sunflowers would be in the shadow of the tall sunflowers, so they might not get enough sunlight to survive.	Say more about being closer to the Sun. Why would that be an advantage? What do sunflowers need to survive?
6 min	**Synthesize/Summarize Today's Lesson** **Synopsis:** In their science notebooks, students draw and label variations in one sunflower-seed trait they observed. Then the teaacher revisits the focus question, and students use evidence from their sunflower investigation to	Engage students in making connections by synthesizing and summarizing key science ideas.	**Show slide 18.** At the beginning of today's lesson, we looked at some sunflower seeds. Let's look at the seeds again. Think of a trait you observed in the sunflower seeds; then draw two variations of that trait in your science notebooks. Make sure to label the trait and the variations. **ELL support:** Make visual and language resources available to ELL students for this activity, especially		

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
	answer it. **Main science idea(s):** • The traits of individuals of the same kind of plant or animal can vary, and we can observe and measure these variations.		resources for the words *trait* and *variations*. **NOTE TO TEACHER:** *Students might draw seeds that vary in color, size, or shape. Show students how to label the trait and the variations, such as "Trait = Color"; "Variations = Black seeds and striped seeds."* **Whole-class share-out:** Who would like to share your drawings with the class? First, tell us what sunflower-seed trait you chose. Then describe the variations you drew. Make sure to use our science words *trait* and *variations* in your descriptions. **NOTE TO TEACHER:** *If time is limited, invite only two or three students to share their drawings with the class.* **Show slide 19.** Today's focus question is *How can we use evidence to show that sunflowers are not all alike even though they're all sunflowers?* How did we show that sunflowers aren't exactly alike	I chose the color trait. I drew one striped seed and one black seed. I showed that the striped seed is larger than the black seed. The size of the seeds.	What color variations did you draw? Did you show any other variations in your drawing? What trait does that show?
		Highlight key science ideas and focus question throughout.			

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
			even though they're all sunflowers? What evidence did we use? **Show slide 20.**	We compared the size of sunflower seeds by putting them next to each other. It showed us that sunflower seeds are different sizes. We measured the stems of the sunflowers to see how tall they were. That sunflowers are different heights. The evidence showed us that sunflowers have *variations* in their height or the length of their stems.	What did that tell us? What other kind of evidence did we use? What did that tell us? Can you say this using our science word *variations*?

Time	Phase of Lesson and How the Science Content Storyline Develops	STeLLA Strategy	Teacher Talk and Questions	Anticipated Student Responses	Possible Probe/Challenge Questions
		Summarize key science ideas.	So the evidence we gathered in our sunflower investigation today showed us that even though sunflowers share many traits, like seeds and stems, they aren't exactly alike. Sunflowers also have many differences in their traits, like the size of their seeds and the height or length of their stems. These differences are called *variations*.		
1 min	**Link to Next Lesson** **Synopsis:** The teacher announces that in the next math lesson, students will construct a bar graph to help them compare and describe the data they collected on trait variations in sunflower plants.	Link science ideas to other science ideas.	**Show slide 21.** In our next lesson, we'll construct a bar graph to help us compare and describe the data or evidence we collected on variations in sunflower traits.		