

Variations in Plants and Animals

Lesson 2b: More Trait Variations in Animals

Grade 1	Length of lesson: 40 minutes	Placement of lesson in unit: 2b of 5 lessons on variations in plants and animals
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 questions: How are snakes alike and different? What traits and variations do they have? How could variations in a trait help them survive and produce young (babies)?
Main learning goal: Plants or animals of the same group share similar characteristics or traits that we can recognize. They also have variations in traits that help them survive.		
Science content storyline: Animals, such as snakes, can be grouped together because they have many similar traits. We group them together because they're more alike than different. But even though animals of the same group share the same basic traits, they don't look exactly alike. Their traits can vary from individual to individual. Individual animals of the same group show differences (variations) in many traits that we can observe and describe. Some variations help individual animals survive in their environment so they can produce young (babies).		
Ideal student response to the focus questions: Snakes can be grouped together because they have traits that are more alike than different. For example, they all have eyes, scales on their skin, mouths, and a long body with no arms or legs. But not all snakes are alike. Some have long bodies, and some have shorter bodies. Some have different colors, like yellow and black or red and orange. If we look carefully, we can see how snakes are alike and different, and we can describe their traits and variations. Snakes with colors that help them blend into their surroundings will have a better chance of surviving and having babies.		

Preparation

Materials Needed

- Student notebooks
- Chart paper and markers
- Class chart of bird traits and variations (from lesson 1c)
- Class chart of plant traits and variations (from lesson 1d)
- Children's picture books about snakes (with variations in color, shape, size of snakes).

Student Handouts

- 2.3 Snakes (2 photos per student)

Ahead of Time

- Review Common Student Ideas about Variations in Plants and Animals and sections 3 and 4 in the content background document.
- Cut apart handout 2.3 (Snakes). Each student will get two different photos of snakes to compare.
- Find a few children's picture books about snakes to show students.
- **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 students to draw on when writing and speaking. Identify words in the lesson plan to review with students in advance, including *young* (babies) and *investigate*. Review the words *traits*, *characteristics*, *alike*, *different*, and *variations*.

Lesson 2b General Outline

Time	Phase of Lesson	How the Science Content Storyline Develops
5 min	Link to previous lessons: The teacher engages students in reviewing the traits and variations they observed in birds and plants in previous lessons.	<ul style="list-style-type: none"> Animals, such as birds, can be grouped together because they share many similar traits. Plants that share many of the same traits can also be grouped together. But the traits within each group of birds or plants can vary from individual to individual.
1 min	Lesson focus questions: The teacher introduces the focus questions, <i>How are snakes alike and different? What traits and variations do they have? How could variations in a trait help them survive and produce young (babies)?</i>	
6 min	Setup for activity: Students look at pictures of two different snakes and identify the traits they share. Then students consider whether the snakes have variations in these traits.	<ul style="list-style-type: none"> Just like birds or sunflowers, snakes can be grouped together because they share many traits that make them more alike than different. Snakes also have variations in their traits, such as different sizes and colors.
10 min	Activity: Students look for more traits that the snakes share, and then they identify and describe variations in these traits. Then the teacher records on a class chart the traits and variations students observed.	<ul style="list-style-type: none"> All snakes share the same basic traits, but they aren't exactly alike. They also have many differences or variations in traits, such as size, shape, and color. Traits can vary from individual to individual, and we can observe and describe these variations.
6 min	Follow-up to activity: The teacher revisits the focus questions, and students share what they learned about traits and variations from their snake investigation. Then they discuss how variations can help snakes survive so they can produce young (babies).	<ul style="list-style-type: none"> If we look carefully, we can see how snakes are alike and different. All snakes have the same basic traits that make them more alike than different. But they aren't exactly alike. They also have variations in traits that we can observe and describe, such as different sizes, shapes, and colors. Some variations can help snakes survive so they can produce young (babies).
10 min	Synthesize/summarize today's lesson: To summarize their understandings of traits and variations, students compare two pictures of snakes and identify similarities and differences in their traits. Then they consider how variations in their traits might help them survive in their environment.	<ul style="list-style-type: none"> Snakes share many traits that make them more alike than different. But snakes aren't exactly alike. Their traits can vary from individual to individual. Certain trait variations can help a snake survive in its environment so it can produce young (babies).
2 min	Link to next lesson: The teacher elicits student ideas about which color variations in snakes might help them survive in different environments. Then the teacher announces that in the next lesson, students will explore how trait variations can help cottonwood-tree seeds survive so they can make more cottonwood trees.	

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5 min	<p>Link to Previous Lessons</p> <p>Synopsis: The teacher engages students in reviewing the traits and variations they observed in birds and plants in previous lessons.</p> <p>Main science idea(s):</p> <ul style="list-style-type: none"> Animals, such as birds, can be grouped together because they share many similar traits. Plants that share many of the same traits can also be grouped together. But the traits within each group of birds or plants can vary from individual to individual. 	<p>Engage students in analyzing and interpreting data and observations.</p> <p>Summarize key science ideas.</p>	<p>Show slides 1 and 2.</p> <p>Let’s talk about what we’ve discovered so far about traits and variations. First, who can tell us what a trait is?</p> <p>Right! A trait is a feature or characteristic that living things have in common or share.</p> <p>Now who can tell us what a variation is?</p> <p>Yes! Variations are differences in the traits that living things share.</p> <p>NOTE TO TEACHER: <i>If you taught the two supplemental math lessons, remind students that in these lessons, they compared variations in sunflower seeds and measured variations in sunflower plants. Then they displayed their data on a chart and a bar graph. Discuss the results of this investigation with students and ask the following questions:</i></p> <ul style="list-style-type: none"> <i>What variations in sunflower traits did we measure?</i> <i>Do you think taller sunflowers are more</i> 	<p>It’s a feature that living things of the same kind share.</p> <p>It’s a difference in a trait.</p> <p><i>We looked at the size and colors of sunflower seeds.</i></p> <p><i>We measured how tall the sunflower plants were.</i></p>	

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			<p><i>likely to survive than shorter sunflowers?</i></p> <ul style="list-style-type: none"> <i>Do you think yellow sunflowers are more likely to survive than orange ones? Why?</i> <i>Why might some variations in sunflowers help them survive and grow?</i> <p>Show slide 3.</p> <p>Now let's look at our class chart of traits and variations in birds.</p>	<p><i>I think taller sunflowers will survive because they can get more sunlight and air.</i></p> <p><i>I think the wind will blow down the tall sunflowers, and the shorter ones won't get blown down, so they'll survive longer.</i></p> <p><i>I think yellow sunflowers get more sun, so they'll survive longer.</i></p> <p><i>I don't think the color really matters.</i></p>	<p><i>Does anyone have a different idea?</i></p> <p><i>Why do you think the color doesn't matter?</i></p>

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			<p>Who can name one trait that all birds share and two variations of that trait? Come up and show us your examples on the chart. Make sure you use our science words in your examples.</p> <p>Show slide 4.</p> <p>Next, look at our class chart of traits and variations in plants.</p> <p>Who can name one trait that plants share and two variations of that trait? Come up and show us on the class chart. Please use our new science words in your answer.</p> <p>In today’s lesson, we’ll add to our understandings of traits and variations in living things.</p>		
1 min	<p>Lesson Focus Questions</p> <p>Synopsis: The teacher introduces the focus questions, <i>How are snakes alike and different? What traits and variations do they have? How could variations in a trait help them survive and produce young?</i></p>	Set the purpose with a <u>focus question</u> or goal statement.	<p>Show slide 5.</p> <p>Today we’ll think about the focus questions, <i>How are snakes alike and different? What traits and variations do they have? How could variations in a trait help them to survive and produce young?</i></p> <p>Write these questions in your science notebooks and draw a box around them.</p> <p>NOTE TO TEACHER: <i>Write the focus questions on the board for students to refer to throughout the lesson.</i></p> <p>In this lesson, we’ll explore traits and variations in snakes. For this investigation, we’ll look at photos</p>		

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			of snakes, not the real thing!		
6 min	<p>Setup for Activity</p> <p>Synopsis: Students look at pictures of two different snakes and identify the traits they share. Then students consider whether snakes have variations in their traits.</p> <p>Main science idea(s):</p> <ul style="list-style-type: none"> Just like birds or sunflowers, snakes can be grouped together because they share many traits that make them more alike than different. Snakes also have variations in their traits, such as different sizes and colors. 	Ask questions to elicit student ideas and predictions.	<p>Show slide 6.</p> <p>Look at the snakes in these photos. In what ways are these snakes alike? What traits do they share?</p> <p>ELL support: During the lesson preview, ask ELL students what they know about snakes or invite them to share any experiences they’ve had with snakes. Allowing them to draw on their own experiences and knowledge can help orient them to the subject matter and use this knowledge as a resource during the lesson.</p> <p>Now raise your hand if you think that snakes have variations in their traits just like birds do.</p> <p>Let’s find out!</p>	<p>They don’t have arms or legs.</p> <p>Both snakes have heads.</p> <p>They have long bodies.</p> <p>They’re curvy.</p>	
10 min	<p>Activity</p> <p>Synopsis: Students look for more traits that the snakes share, and then they identify and describe variations in these traits. Then the teacher records on a class chart the traits and</p>	Engage students in analyzing and interpreting data and	<p>Show slide 7.</p> <p>First, let’s record these snake traits on a class chart.</p> <p>NOTE TO TEACHER: <i>Create a two-column chart similar to the ones you created in earlier lessons. Use the heading “Traits of Snakes” for the first column and “How Snakes Are Different (Variations in Snake Traits)” for the second</i></p>		

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	<p>variations students observed.</p> <p>Main science idea(s):</p> <ul style="list-style-type: none"> All snakes share the same basic traits, but they aren't exactly alike. They also have many differences or variations in traits, such as size, shape, and color. Traits can vary from individual to individual, and we can observe and describe these variations. 	<p>observations.</p>	<p><i>column. As students identify traits and variations of snakes, record them on the chart.</i></p> <table border="1" data-bbox="835 383 1409 727"> <thead> <tr> <th data-bbox="835 383 1010 464">Traits of Snakes</th> <th data-bbox="1010 383 1409 464">How Snakes Are Different (Variations in Snake Traits)</th> </tr> </thead> <tbody> <tr> <td data-bbox="835 464 1010 537">No arms or legs</td> <td data-bbox="1010 464 1409 537"></td> </tr> <tr> <td data-bbox="835 537 1010 578">Heads</td> <td data-bbox="1010 537 1409 578"></td> </tr> <tr> <td data-bbox="835 578 1010 683">Long, skinny bodies</td> <td data-bbox="1010 578 1409 683"></td> </tr> <tr> <td data-bbox="835 683 1010 727">Curvy</td> <td data-bbox="1010 683 1409 727"></td> </tr> </tbody> </table> <p>What traits do all snakes have in common?</p> <p>Show slide 8.</p> <p>Now let's look for variations in their traits. How are the snakes in these photos different?</p> <p>NOTE TO TEACHER: <i>As students share their observations, record trait variations on the class chart.</i></p>	Traits of Snakes	How Snakes Are Different (Variations in Snake Traits)	No arms or legs		Heads		Long, skinny bodies		Curvy		<p>They don't have arms or legs.</p> <p>They have heads.</p> <p>They have long bodies.</p> <p>They're curvy.</p> <p>The snakes have different colors.</p> <p>The snakes have variations in their</p>	<p>Can you use the words <i>trait</i> and <i>variations</i> in your answer?</p>
Traits of Snakes	How Snakes Are Different (Variations in Snake Traits)														
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			<p>ELL support: If you recorded adjectives on a word wall in previous lessons or had ELL students create a dictionary of adjectives, encourage them to use these resources to help them describe the trait variations they observe.</p> <p>So one variation we noticed is that the snakes are different colors. Who can describe the colors?</p> <p>What about the markings on their skin? Can someone describe those?</p> <p>Do you notice any other variations in their traits?</p> <p> Listen to students' ideas. What's visible about student thinking? Are students beginning to make sense of traits and variations?</p>	<p>color trait.</p> <p>One snake is light brown, and the other snake is red, white, and black.</p> <p>The red, white, and black snake has stripes, and the brown snake has diamond patterns on its skin.</p> <p>The snakes are different sizes. The brown one is bigger, and the other one is smaller.</p> <p>One looks fatter than the other.</p>	<p>What do you mean by “bigger” and “smaller”?</p>
6 min	<p>Follow-Up to Activity</p> <p>Synopsis: The teacher revisits the focus questions, and students share what they learned about traits</p>	Highlight key science ideas and focus question	<p>Show slide 9.</p> <p>Let's revisit our focus questions, <i>How are snakes alike and different? What traits and variations do they have? How could variations in a trait help them survive and produce young (babies)?</i></p>		

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	<p>and variations from their snake investigation. Then they discuss how variations can help snakes survive so they can produce young (babies).</p> <p>Main science idea(s):</p> <ul style="list-style-type: none"> • If we look carefully, we can see how snakes are alike and different. • All snakes have the same basic traits that make them more alike than different. But they aren't exactly alike. They also have variations in traits that we can observe and describe, such as different sizes, shapes, and colors. Some variations can help snakes survive so they can produce young (babies). 	throughout.	<p>We've already talked about several traits that snakes share. Who can name one way that snakes are alike?</p> <p>NOTE TO TEACHER: <i>During this discussion, encourage students to refer to traits and variations on the class chart.</i></p> <p>Who can tell us how snakes are different? What variations in traits do they have?</p> <p>So one variation in snake traits is the length of their bodies. What other variations did we find?</p> <p>Yes, snakes can have different colors. That's another variation.</p> <p>Now let's think about our third focus question. <i>How could variations in a trait help snakes survive and produce young (babies)?</i></p> <p>Show slide 10.</p> <p>Look carefully at the pictures of the two snakes</p>	<p>They don't have arms or legs.</p> <p>A trait that snakes share is that they don't have arms or legs.</p> <p>They're different lengths.</p> <p>Length is one trait variation in snakes.</p> <p>Snakes are different colors.</p>	<p>Can you say this using the word <i>trait</i>?</p> <p>Can you use the word <i>variation</i> in your answer?</p>

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			<p>again.</p> <p>What do you notice about their environment or where they live?</p> <p>What about the light-brown snake? Do you think the color of the snake matches the color of the rocks it's sitting on?</p> <p>If you were an eagle looking for a nice, juicy snake to eat, would it be easy to see this snake? Why or why not?</p> <p>Now look at the red-white-and-black-striped snake.</p> <p>Do you think the color of the snake matches the color of the rock it's sitting on?</p> <p>If you're that eagle looking for a nice, juicy snake to eat, do you think you'd be able to see it? Why or why not?</p> <p>What will probably happen to the red-white-and-black-striped snake? Why?</p>	<p>They're both on the ground.</p> <p>Yes.</p> <p>No.</p> <p>Because the snake matches the color of the rocks.</p> <p>No, the color doesn't match.</p> <p>Yes, I'd be able to see it.</p> <p>Because it's red, and the rocks are brown and black.</p> <p>The snake will be eaten!</p>	<p>Why?</p> <p>Why?</p> <p>Why do you think that?</p>

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			<p>Which snake do you think will have a better chance of surviving because of its color variation? Why?</p> <p>If the light-brown snake doesn't get eaten and the red-white-and-black-striped one does, which snake will have a better chance of having babies? Why?</p>	<p>The eagle will see it.</p> <p>The light-brown snake, because it matches the rocks.</p> <p>The light-brown snake will have babies because it has traits that help it survive.</p>	
10 min	<p>Synthesize/Summarize Today's Lesson</p> <p>Synopsis: To summarize their understandings of traits and variations, students compare two pictures of snakes and identify similarities and differences in their traits. Then they consider how variations in their traits might help them survive in their environment.</p> <p>Main science idea(s):</p> <ul style="list-style-type: none"> Snakes share many traits that make them more alike than different. But snakes aren't exactly 	Engage students in making connections by synthesizing	<p>Show slide 11.</p> <p>Next, I'm going to give you a handout with pictures of two new snakes to compare.</p> <p>NOTE TO TEACHER: <i>Distribute the snake photos from handout 2.3 (Snakes).</i></p> <p> Embedded Assessment Task</p> <p>Show slide 12.</p> <p>Look very carefully at each snake and think about one way the snakes are alike. What is one trait they share? Then on each picture, draw a circle around that trait and write a word that describes the trait.</p>		

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	<p>alike. Their traits can vary from individual to individual. Certain trait variations can help a snake survive in its environment so it can produce young (babies).</p>	<p>and summarizing key science ideas</p>	<p>ELL support: Encourage ELL students to use visual resources (word wall, word or picture dictionaries, the class chart, and photographs) to help them remember the names of traits and adjectives that describe trait variations.</p> <p>After you circle the traits on your handout, look for two differences or variations in the trait you circled. Then draw a line pointing to each variation in that trait and write a word that describes the variation.</p> <p>Individual work time.</p> <p>Whole-class discussion: So who would like to share the trait you circled on your handout that both snakes share?</p> <p>Who else would like to share the trait you circled?</p>	<p>I circled the bodies of the snakes to show that both are thin and flexible.</p> <p>Shape.</p> <p>I circled the snakes' heads.</p> <p>I circled their eyes.</p> <p>I used the words</p>	<p>What word did you use to describe this trait?</p> <p>What word did you use to describe this trait?</p>

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			<p>Now who would like to share the two differences or trait variations you marked on your handouts? What variations do your lines point to?</p> <p>Who chose a different trait variation?</p> <p>Which variation in the color trait might give a snake a better chance of surviving?</p>	<p><i>body parts.</i></p> <p>I drew one line pointing to the snakes' color.</p> <p>Body color.</p> <p>One snake is brown, and one is black and yellow.</p> <p>I drew a line pointing to the snakes' length.</p> <p>Size.</p> <p>One snake is longer than the other.</p> <p>I think the brown snake has a better</p>	<p>What word did you use to describe this variation?</p> <p>What variations in body color did you observe in the snakes?</p> <p>What word did you use to describe this variation?</p> <p>What variations did you observe?</p>

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			<p>How might the variation in body length give one snake a better chance of surviving?</p>	<p>chance of surviving.</p> <p>Because it can blend in better with the sand and dirt. Birds could see the yellow-and-black snake better, so it would probably get eaten first.</p> <p>I think it might be easier for the smaller snake to find places to hide. So even though it's black and yellow, it could hide from birds by squeezing into small spaces.</p>	<p>Why do you think so?</p>
2 min	<p>Link to Next Lesson</p> <p>Synopsis: The teacher elicits student ideas about which color variations in snakes might help them survive in different environments. Then the teacher announces that in the next lesson, students will explore how trait variations can help</p>	<p>Summarize key science ideas.</p> <p>Ask questions to elicit student ideas and predictions.</p>	<p>Show slide 13.</p> <p>Today we learned about traits and variations in snakes. We also talked about how variations in a trait can help some snakes survive better.</p> <p>Think about a snake in a grassy area and a snake on a gray rock. How might the color of the snake help it survive so it can have babies?</p>	<p>If the snake in the grassy area is green, it has a better</p>	

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	cottonwood-tree seeds survive so they can make more cottonwood trees.		<p>Show slide 14.</p> <p>In our next lesson, we'll think about how variations in a trait might help cottonwood-tree seeds survive so they can make more cottonwood trees.</p> <p>NOTE TO TEACHER: <i>Before you begin lesson 3a, read to students A Dandelion's Life by John Himmelman. The book is in the lesson materials kit.</i></p>	<p>chance of surviving because it can hide better.</p> <p>No! I think birds would see the green snake better on the gray rock and eat it!</p>	<p>What if the green snake is on a gray rock? Do you think it would have a better chance of surviving there than in the grassy area?</p>