

Variations in Plants and Animals Lessons: Scope and Sequence

Lesson Number	Focus Question(s)	Main Learning Goal	Science Content Storyline
Supplemental Math 1	How can we use evidence to show that sunflowers are not all alike even though they're all sunflowers?	The traits of individuals of the same kind of plant or animal can vary, and some of these traits can be measured.	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.
Supplemental Math 2	How can we use evidence to show that sunflowers are not all alike even though they're all sunflowers?	The traits of individuals of the same kind of plant or animal can vary, and some of these traits can be measured. We can use the measurements to confirm how much variation exists in a trait.	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. After collecting more data, we can display this evidence in a variety of ways, such as using a data table and a bar graph.
1a	How are birds alike? What traits do they share?	Animals of the same kind are similar in many ways. These similar features or characteristics are called <i>traits</i> .	Animals of the same kind are alike in many ways. For example, people share similar characteristics, such as a head, two arms, two legs, 10 fingers, and 10 toes. We call these similar characteristics <i>traits</i> . Birds have different traits than people. For example, we know that a bird is a bird because it has two legs, two feet, feathers, wings, a tail, and a beak. These are the traits birds share. Birds can also have different traits, such as different beak sizes and feather colors.

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1b	How are plants alike? What traits do they share?	Plants or animals of the same group share similar features or characteristics that we can recognize. These shared characteristics are called <i>traits</i> . All plants share certain traits, such as flowers, stems, leaves, seeds, and roots.	Certain animals or plants can be grouped together because they have many similar traits or characteristics. We group them together because they're more alike than different. For example, we know that a plant is a plant because it has flowers, seeds, a stem, leaves, and roots.
1c	How are birds alike and different? What differences in a trait can they have?	Plants or animals of the same group share similar features or characteristics that we can recognize. These shared characteristics are called <i>traits</i> . Living things of the same kind also have variations in traits that help them survive.	Certain animals or plants can be grouped together because they share many characteristics or traits. We group them together because they're more alike than different. For example, we know a bird is a bird because it has two legs, two feet, feathers, wings, a tail, and a beak. Even though birds have the same basic traits, they don't look exactly alike. Their traits can vary from individual to individual. Birds show differences (variations) in many traits that we can observe and describe. Some of these trait variations help individual birds survive in their environment.
1d	How are plants alike and different? What differences in a trait can they have?	Plants or animals of the same group share similar features or characteristics that we can recognize. We call these shared characteristics <i>traits</i> . Living things of the same kind also have variations in traits that help them survive.	Certain animals and plants can be grouped together because they have many similar traits (characteristics). We group them together because they're more alike than different. For example, we know a plant is a plant because it has a flower, leaves, stem, roots and seeds. Even though plants have the same basic traits, they don't look exactly alike. Their traits can vary from individual to individual. Plants show differences (variations) in many traits that we can observe and describe. Some of these trait variations help individual plants survive in their environment.

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2a	How are sunflowers alike and different? What traits and variations do they have?	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.	Plants, such as sunflowers, can be grouped together because they have many similar traits. We group them together because they're more alike than different. But even though plants of the same group share the same basic traits, they don't look exactly alike. Their traits can vary from individual to individual. Individual plants of the same group show differences (variations) in many traits that we can observe and describe. These variations can help individual plants survive in their environment.
2b	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)?	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.	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).
3a/b	Will bigger or smaller cottonwood-tree seeds be more likely to survive and grow when the wind carries them away? Why do you think so?	Trait variations in plants or animals of the same kind affect which individual plants or animals survive and which don't.	The traits of individuals of the same kind of animal or plant, such as a cottonwood tree, can vary. For example, some cottonwood-tree seeds are bigger than others. When the wind disperses seeds, the size of the seeds can affect how far they travel. Scientists collect and analyze data (evidence) to find out whether trait variations, such as the size of cottonwood-tree seeds, affect which plants or animals of the same kind survive and which don't. A model can help us test ideas when it's too hard to test them in the real world.

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4a/b	What helps some cottonwood-tree seeds survive and grow while other seeds don't?	Trait variations in individual plants or animals of the same kind <i>and</i> variations in the environment affect which plants or animals survive and which don't.	Cottonwood-tree seeds aren't exactly the same. For example, some seeds are bigger, and others are smaller. This variation in size affects how far individual seeds will travel on the wind and can determine whether a seed will survive and grow. The environment where the seed lands also influences whether it will survive and grow. So both trait variations <i>and</i> variations in the environment affect which plants or animals will survive and grow. Scientists collect and analyze data (evidence) to find out whether these factors affect which living things survive and which don't.
5a	How do differences (variations) in the traits of dandelions help them survive so they can produce young (seeds)?	Variations in traits and the environment affect which plants or animals of the same kind survive long enough to produce young (seeds/babies), and thus which variations become more common in the next generation.	Plants or animals of the same kind have traits that can vary. Often, one variation in a trait, such as the smaller size of cottonwood-tree seeds, can help an individual plant or animal survive in its environment. Plants or animals with a particular trait variation are more likely to survive and live long enough to produce young (seeds or babies) if their environment provides what they need. The seeds or babies of those plants or animals are more likely to have the same trait variations as their parents; consequently, these variations become more common in the next generation of plants or animals. In other words, trait variations in plants or animals of the same kind that survive and produce young become more common over time.
5b	How do differences (variations) in the traits of giraffes help them survive so they can produce young (babies)?		

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5c	How do differences (variations) in plants or animals of the same kind help them survive so they can produce young (babies or seeds)?		