Earth's Changing Surface
Lesson 1a: Landforms on Earth's Surface

Grade 4	**Length of lesson:** 45 minutes	**Placement of lesson in unit:** 1a of 7 two-part lessons on Earth's changing surface
Unit central questions: Why isn't all of Earth's surface flat? What causes the surface to look different in different places?		**Lesson focus questions:** Does the surface of Earth look the same everywhere? In what ways does Earth's surface look different or the same in different places?
Main learning goal: Earth's surface has a variety of landforms.		
Science content storyline: Earth's surface has a variety of landforms, or surface features, that can be described and categorized. The landforms of any one location can look different from those of other regions in the United States, even though specific landforms, such as mountains and river valleys, can be found in many locations.		
Ideal student response to the focus questions: Earth's surface doesn't look the same everywhere. There are a variety of landforms—like mountains, hills, valleys, canyons, plains (flat surfaces), rivers, and lakes—in different places. In some places in the United States, the surface is very mountainous, and in other places, the surface is very flat, so these places look different. But there are more flat places than mountainous places across the US, so some places on Earth's surface look almost the same.		

Preparation

Materials Needed • Science notebooks • Chart paper and markers • Plastic relief map of the United States (1 per group of 4–6 students)	**Ahead of Time** • Review Earth's Changing Surface Content Background Document: sections 1–3.

Lesson 1a General Outline

Time	Phase of Lesson	How the Science Content Storyline Develops
5 min	**Unit central questions:** The teacher introduces the unit central questions, *Why isn't all of Earth's surface flat? What causes the surface to look different in different places?* Then the teacher elicits student ideas about the shape of Earth's surface.	
3 min	**Lesson focus questions:** The teacher introduces the focus questions, *Does the surface of Earth look the same everywhere? In what ways does Earth's surface look different or the same in different places?*	
10 min	**Setup for activity:** The teacher elicits student ideas about the first focus question, *Does the surface of Earth look the same everywhere?*	• Earth's surface has a variety of landforms, including mountains, hills, valleys, canyons, plains (flat surfaces), rivers, and lakes.
10 min	**Activity:** Students identify a variety of surface landforms on a relief map of the United States and observe their specific locations.	• The surface of the United States has a variety of landforms, including mountains, hills, valleys, canyons, plains (flat surfaces), rivers, and lakes.
10 min	**Follow-up to activity:** Students discuss the surface landforms they observed on a relief map of the United States and describe where they're located. They also note differences and similarities in surface features across the United States.	• The surface features or landforms of any one location can look different from those of other regions in the United States, even though specific landforms, such as mountains and river valleys, can be found in many locations.
6 min	**Synthesize/summarize today's lesson:** Students review the focus questions and synthesize and summarize key science ideas.	• The surface of Earth has a variety of landforms, so it doesn't look the same everywhere. We can observe and describe the similarities and differences in Earth's landforms and where they're located.
1 min	**Link to next lesson:** The teacher links key science ideas to the next lesson.	

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	**Unit Central Questions** **Synopsis:** The teacher introduces the unit central questions, *Why isn't all of Earth's surface flat? What causes the surface to look different in different places?* Then the teacher elicits student ideas about the shape of Earth's surface.	Ask questions to elicit student ideas and predictions.	**Show slides 1 and 2.** Today we're beginning a unit about Earth's changing surface. What do you already know about the surface of Earth? For example, when you look outside, how would you describe the landscape? What shapes and features do you notice? **NOTE TO TEACHER:** *If students don't know where to begin, or if phrases like "Earth's surface" or the "shape of the landscape" confuse them, ask, "How would you describe the shape of the land around us? Is it flat or hilly? What else do you notice?"* *Students may want to discuss plants and animals, weather, snow, sand, dirt, or man-made features, such as tall buildings, but point out that these aren't landforms. Landforms are the natural form and shape of Earth that include such things as mountains, hills, valleys, and streams, not living or man-made objects.* **ELL support:** Use pictures of various landforms to support vocabulary development among ELL students. Have any of you ever lived in a place where	• Mountains • Valleys • Rivers • Hills • Streams • Oceans • Flat • Hilly	

			the landscape looked different from what we see outside now? How was it different? **Show slide 3.** Over the next seven lessons, we're going to think about two unit central questions: *Why isn't all of Earth's surface flat? What causes the surface to look different in different places?* Write these questions in your science notebooks and draw a double-lined box around them. **NOTE TO TEACHER:** *Also write these questions on the board for the class to see and refer to throughout the unit. Don't discuss them with students at this time.*		
3 min	**Lesson Focus Questions** **Synopsis:** The teacher introduces the focus questions, *Does the surface of Earth look the same everywhere? In what ways does Earth's surface look different or the same in different places?*	Set the purpose with a <u>focus question</u> or goal statement.	**Show slide 4.** Today we're going to look at surface landforms across the United States and think about these focus questions: *Does the surface of Earth look the same everywhere? In what ways does Earth's surface look different or the same in different places?* Copy these questions into your science notebooks and draw a box around them. **NOTE TO TEACHER:** *Write the focus questions on the board for students to see and refer to throughout the lesson.*		
10 min	**Setup for Activity** **Synopsis:** The teacher elicits student ideas about		Let's talk about the first focus question, *Does the surface of Earth look the same everywhere?*		

	the first focus question, *Does the surface of Earth look the same everywhere?* **Main science idea(s):** • Earth's surface has a variety of landforms, including mountains, hills, valleys, canyons, plains (flat surfaces), rivers, and lakes.	Ask questions to elicit student ideas and predictions. Make explicit links between science ideas and activities **before** the activity.	**NOTE TO TEACHER:** *Discuss only the first focus question at this time. The second question will be explored later.* If we looked at a map of the United States that showed landforms on the surface of Earth, what might we see? Let's clarify what we mean by a *landform*. How would you describe a landform on Earth's surface? So a mountain is an example of a landform. When we talk about landforms, we're referring to the surface of Earth that we walk on—the natural part, not the part people make, like parking lots. Our focus is the land itself, not living or nonliving things on the land. When we talk about landforms, we're also describing the surface of Earth in terms of its shape and distinctive qualities. For example,	We'd see that there are mountains in California but not everywhere in the United States. There are hilly places and flat places. It sounds like a landform is about the land. Like forms of the land. Not really. Like a mountain?	What have you seen that makes you think that? What does someone else think? Can you say more about that? Can you give an example?

			a lake is a landform because it's part of Earth's surface. What are the distinctive features of a lake? What makes a lake different from a mountain? **ELL support:** Talking about the distinctive qualities of landforms could be problematic for students from indigenous communities where this distinction isn't relevant to their lives or what they've seen. You may need to be more explicit about where this distinction comes from (disciplinary perspectives) and why it's useful. Consider that what students and their families *do* in, on, or around a landform, such as a hill, valley, or lake, might help them describe it physically. **Show slide 5.** Which of the pictures on this slide are examples of landforms and why? **Show slide 6.** For today's activity, we're going to study landforms on a map. But first let's do some brainstorming to make sure we know what we mean when we talk about landforms. How many different kinds of landforms on Earth's surface can you name? **NOTE TO TEACHER:** *Record student responses on chart paper so you can refer to them again at the end of the lesson and add*	A lake is filled with water. It's kind of like a hole in the ground filled with water. It's lower down than a mountain. The mountains and the stream are landforms because they're part of Earth's surface, not living things or things people make. • Mountains • Rivers • Lakes • Valleys • Deserts	

			to them in lesson 1b. Title the chart "Landforms on Earth's Surface." You don't need to elicit an exhaustive list or spend too much time on this discussion. The important thing is for students to have a clear idea of what landforms are. *If you get some incorrect answers, such as sky, jungle, or canal, inform students that these aren't landforms. Review the characteristics of a landform; then ask, "Why do I say [the sky, the jungle, a canal] is not a landform? Is it part of the land? Does it give shape to Earth's surface? Does it have distinctive qualities that make it different from other landforms?* **ELL support:** Consider what landforms are as well as what they are not.  *Listen to students' ideas. What's visible about student thinking? Do students understand the meaning of the word* landforms*? (Check your own understanding by reviewing the first three sections in the content background document.) Keep in mind that students might use different regional or cultural terms to describe the same landform, such as* valley*,* arroyo*, or* gulch*.* **ELL support:** Naming practices can be a helpful classroom resource for ELL students if used generatively. These names are often more descriptive of a place than the accepted scientific term, and they may even tell a story. These practices can be a valuable way of connecting to students' lives, practices,	• Oceans • Canyons • Cliffs • Hills • Ponds • Plains • Plateaus • Seas	

			and values.		
10 min	**Activity** **Synopsis:** Students identify a variety of surface landforms on a relief map of the United States and observe their specific locations. **Main science idea(s):** • The surface of the United States has a variety of landforms, including mountains, hills, valleys, canyons, plains (flat surfaces), rivers, and lakes.	Select content representations and models matched to the learning goal and engage students in their use. Make explicit links between science ideas and activities **during** the activity.	**Show slide 7.** Now we're going to examine a special kind of map of the United States that shows different landforms on the surface of Earth. This kind of map is called a *relief map*. What do you notice about the relief maps on this slide? How are they different from a regular map? **ELL support:** The word *relief* has both a technical and an everyday meaning. This distinction may be useful to address with ELL students. **NOTE TO TEACHER:** *Divide the class into groups of four to six students and distribute a relief map to each group. Place each map on a table or group of desks and ask students to gather around the map so they can see and touch the surface.* **Show slide 8.** How many different landforms can you identify on this relief map of the United States? Use both your eyes and your hands to find as many landforms as you can and then list them in your notebooks. **NOTE TO TEACHER:** *Allow 10 minutes for students to explore the relief map and look for different landforms. Make sure everyone gets a turn examining and handling the map. Ask students to jot down notes about the various landforms they find so they can share their observations with the class. Inform students that the map is oriented with*		

			north at the top, and ask them to identify which directions are east, west, and south. *As you circulate among the groups, ask students to share with you the landforms they identify. Remind them to use appropriate vocabulary or names for the landforms. Don't introduce a lot of new vocabulary at this time, but help students use common names for landforms they should already know about.* **ELL support:** Consider using index cards with names and images of landforms for ELL students to identify on the relief map.		
10 min	**Follow-Up to Activity** **Synopsis:** Students discuss the surface landforms they observed on a relief map of the United States and describe where they're located. They also note differences and similarities in surface features across the United States. **Main science idea(s):** • The surface features or landforms of any one location can look different from those of other regions in the United States, even though specific landforms, such as mountains and river	Engage students in analyzing and interpreting data and observations. Make explicit links between science ideas and activities **after** the activity.	**Show slide 9.** Now let's find out how many different landforms you identified on the relief map. and compare them with the list we recorded earlier on chart paper. So what different landforms did you find on the relief map? What new landforms can we add to our list? **NOTE TO TEACHER:** *Add to the list you made earlier the names of any new landforms students mention. Save this chart for use in lesson 1b.* **Show slide 10.** Did you notice anything interesting about where specific landforms are located on the	We found canyons and cliffs. We found lakes and rivers.	

	valleys, can be found in many locations.		relief map? For example, where do you find mountains? Where do you find rivers and lakes? Make sure to use the words *north*, *south*, *east*, and *west* when you're describing the locations of specific landforms. **NOTE TO TEACHER:** *Keep this discussion brief. The main purpose is to help students notice that the locations of certain landforms aren't necessarily random. In the next lesson, students will identify patterns in the locations of landforms on Earth's surface.*	In some places, there are a lot of mountains, but in other places, there are only single mountains. There are hills in a lot of places, but mountains are only in the west and east. There are a lot of lakes in the northern US.	Who can add to this description? Say more about the locations of the lakes. Are there other landforms that are often near lakes?
6 min	**Synthesize/Summarize Today's Lesson** **Synopsis:** Students review the focus questions and synthesize and summarize key science ideas. **Main science idea(s):** • The surface of Earth has a variety of landforms, so it doesn't look the same everywhere. We can observe and describe	Highlight key science ideas and focus question throughout.	**Show slide 11.** To wrap up today's lesson, let's return to our focus questions: *Does the surface of Earth look the same everywhere? In what ways does Earth's surface look different or the same in different places?* I think we can probably agree on the answer to the first question. Would you say that Earth's surface looks the same everywhere? Why or why not?	No, the surface of Earth doesn't look the same everywhere. That's obvious on our	

	the similarities and differences in Earth's landforms and where they're located.		So let's think about the second question: *In what ways does Earth's surface look different or the same in different places?* In what ways does Earth's surface look different on the map?	relief maps! Some places are flat, and some are bumpy. Some places have water. We found mountains, but some mountains are smaller than other mountains. In what ways does Earth's surface look the same? There are places in the middle of the country where the surface is mostly flat. The surface mostly looks different everywhere and not so much the same.	What do you mean by "bumpy"? Tell me more about the mountains. Can you give us an example? Does anyone disagree or have anything to add?
		Summarize key science ideas.	**Show slide 12.** So today we learned about two important science ideas: 1. Earth has a variety of landforms, such as mountains, hills, valleys, canyons, plains, rivers, and lakes.		

			2. The landforms on Earth's surface aren't the same everywhere. Where did we find evidence to support these ideas? That's right. The evidence came from the relief map and from our own observations. **Show slide 13.** Our map investigation also helped us identify some important differences and similarities in surface landforms across the United States. • Some areas are low, like valleys and plains, and some are high like mountains). • Many places across the country are flat. • There are many lakes in the northern part of the country. • Many rivers run north to south, but some run west to east.	From the relief map. We saw some evidence with our own eyes.	
1 min	**Link to Next Lesson** **Synopsis:** The teacher links key science ideas to the next lesson.	Link science ideas to other science ideas.	**Show slide 14.** Today we learned that Earth's surface has a variety of landforms with similarities and differences. Do you think the surface of Earth has always looked the way it does today? Do you think it will always look this way? Stay tuned, and we'll find out next time		

			whether the surface of Earth ever changes!		