Earth's Changing Surface Lesson 2b: Landform Detectives

| Grade 2 | Length of lesson: 50 minutes | Placement of lesson: 2b of 6 two-part lessons on Earth's changing surface | | | | |
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| Unit central questions: it ever change? | What does the surface of Earth look like? Does | Lesson focus questions: How does the land on Earth's surface look different in different places? How can representations like relief maps help us compare different places in the United States? | | | | |
| Main learning goal: Landforms, including bodies of water, on Earth's surface look different in different places. Relief maps can help us find landforms in different places and similarities and differences. | | | | | | |
| Science content storyline: Landforms, including bodies of water, can differ from one place to another. In some places, landforms like mountains, hills, or plateaus rise high above Earth's surface, while in other places, valleys and canyons cut deep into the surface. Some places, like plains, are flat and change very little in elevation, and other places have bodies of water, such as rivers and lakes, that are part of the landscape. Relief maps show the elevations of landforms so we can identify the differences and similarities among them. | | | | | | |
| Ideal student response to the focus questions: Landforms look different in different places. Some places have mountains that rise high above Earth's surface, and other places are very flat or have valleys or canyons that cut into Earth's surface. Some places have many bodies of water, while other places have few bodies of water. The land doesn't look the same everywhere. Relief maps show the elevations of different places. A relief map can help us find landforms that are high in elevation or low in elevation. | | | | | | |
| Preparation | | | | | | |
| Materials Needed • Science notebooks • Chart paper and markers • Plastic relief map of the United States (1 per group) • Wall map of the United States Student Handouts and Teacher Masters • Optional ELA extension: 2.2 Landforms (reading and supplemental US map) (1 per student) (for use during ELA time) • 2.3 Map of the United States (Teacher Master) (from lesson 2a) • 2.4 Land Detectives, Part 2 (1 per student) | | Ahead of Time Review the content background document. Optional ELA extension: Prepare handout 2.2 (Landforms) for use in English Language Arts if time allows and the extension activity wasn't used in lesson 2a. An optional ELA extension lesson plan, with a setup, activity, and follow-up, is included at the end of this lesson plan. | | | | |

Lesson 2b General Outline

| Time | Phase of Lesson | How the Science Content Storyline Develops |
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| 5 min | Link to previous lesson: The teacher engages students in reviewing what they learned about relief maps in the previous lesson. | • Relief maps can help us find landforms in different places. The maps show the elevations of different landforms, such as mountains, plains, and canyons. |
| 1 min | Lesson focus questions: The teacher introduces the focus questions, <i>How does the land on Earth's surface look different in different places? How can representations like relief maps help us compare different places in the United States?</i> | |
| 10 min | Setup for activity: The class reviews the landforms they found in two locations on the relief map in the previous investigation. Then the teacher prepares students to investigate landforms in two new locations. | • Relief maps can help us find landforms in different places in the United States so we can compare similarities and differences and identify characteristics and patterns. |
| 15 min | Activity: As land detectives, students work in groups to investigate landform characteristics and patterns in two new locations in the United States using relief maps and Venn diagrams. | • Some places on Earth have landforms like mountains, hills, or plateaus that rise high above Earth's surface, while other places have valleys and canyons that cut into the surface. Some places, like plains, are flat and change very little in elevation, and other places have bodies of water, such as rivers and lakes, that are part of the landscape. |
| 5 min | Follow-up to activity: Students analyze the landforms they identified on their relief maps, comparing similarities and differences between the two locations. | • Landforms, including bodies of water, can differ from one place to another. Relief maps can help us compare and contrast landforms in different places in the United States. |
| 8 min | Synthesize/summarize today's lesson: Students revise their answers to the focus questions using the new evidence they gathered about landforms in two new locations. Then the teacher reviews key science ideas about landforms. | • Landforms, including bodies of water, can differ from one place to another. Some places have landforms like mountains, hills, or plateaus that rise high above Earth's surface, while other places have valleys and canyons that cut into the surface. Some places, like plains, are flat and change very little in elevation, and other places have bodies of water, such as rivers and lakes, that are part of the landscape. Relief maps can help us compare and contrast landforms in different places. |
| 1 min | Link to next lesson: The teacher announces that in the next lesson, students will think about whether landforms ever change. | |

| Time | Phase of Lesson and How the Science Content Storyline Develops | STeLLA Strategy | Teacher Talk and Questions | Anticipated Student Responses | Possible Probe/Challenge Questions |
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| 5 min | Link to Previous Lesson Synopsis: The teacher engages students in reviewing what they learned about relief maps in the previous lesson. Main science idea(s): • Relief maps can help us find landforms in different places. The maps show the elevations of different landforms, such as mountains, plains, and canyons. | Ask questions to elicit student ideas and predictions. | Show slides 1 and 2. Last time, we used relief maps to find landforms in different places in the United States. What did we learn about relief maps? Why are they special? What science word did we learn that describes how high or low the land is in different places? | They help us find landforms in different places. They show how high or low the landforms are. There are bumps and flat places on the map. Elevation. Mountains. | How does a relief map show that? What kinds of landforms have a high elevation on the map? What did you see and feel on the map that made you think that mountains have a high elevation? |

| Time | Phase of Lesson and How the Science Content Storyline Develops | STeLLA Strategy | Teacher Talk and Questions | Anticipated Student Responses | Possible Probe/Challenge Questions |
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| | | | | I could see and feel bumps on the map. | |
| | | | | | What kinds of landform have a low elevation on our map? |
| | | | | Plains have a low elevation. | What did you see and feel that made you think that plains have a |
| | | | | The map was flat and smooth, and there weren't any bumps. | low elevation? |
| | | | Show slide 3. | | |
| | | Summarize key science ideas. | So relief maps are special maps that help scientists find landforms in different places. These maps show how high or low or flat the land is in these places. Scientists use the word <i>elevation</i> to describe high and low places on Earth's surface. | | |
| | | | A high elevation means the land rises high above Earth's surface, and a low elevation means the land is low or flat. | | |
| | | | In our last lesson, we used our relief maps to look at landforms in Seattle, Washington, and Atlanta, Georgia. Today we're going to investigate landforms in | | |

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| | | | two new places. | | |
| 1 min | Lesson Focus Questions | | Show slide 4. | | |
| | Synopsis: The teacher introduces the focus questions, <i>How does the</i> <i>land on Earth's surface</i> <i>look different in different</i> <i>places? How can</i> <i>representations like relief</i> <i>maps help us compare</i> <i>different places in the</i> <i>United States?</i> | Set the purpose with a <u>focus</u> <u>question</u> or goal statement. | We know what the land looks like in Seattle and Atlanta from looking at our relief maps. We also know a little about what the land might look like in other places in the United States. Our focus questions last time were <i>How</i> <i>does the land on Earth's surface look</i> <i>different in different places? How can</i> <i>representations like maps help us find</i> <i>different landforms in the United States?</i> Our focus questions for today are like the ones from last time, but our second question is a little different: <i>How can</i> <i>representations like relief maps help us</i> <i>compare different places in the United</i> <i>States?</i> Last time we explored how maps can help us <i>find</i> different landforms. Today we'll explore how relief maps can help us <i>compare</i> different places. Write this new focus question in your science notebooks and draw a box around it. | | |

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| | | | NOTE TO TEACHER: Write the new focus question on the board for students to refer to throughout the lesson. | | |
| 10 min | Setup for Activity Synopsis: The class reviews the landforms they found in two locations on the relief map in the previous investigation. Then the teacher prepares students to investigate landforms in two new locations. Main science idea(s): Relief maps can help us find landforms in different places in the United States so we can compare similarities and differences and identify characteristics and patterns. | | Today we'll use our relief maps to investigate landforms in two new places. But first, let's think about the landforms we found on our maps last time. Show slide 5. What locations did we investigate? ELL support: If you want students to use the cardinal directions (north, south, east, west) in their descriptions, make this explicit so ELL students know what is being asked of them. | Seattle and Atlanta. Seattle is in the west next to the Pacific Ocean. Atlanta is in the eastern and southern part of the US. | Where are Seattle and Atlanta on the map? How do you know that Seattle is in the west and Atlanta is in the |
| | | Ask questions to elicit student ideas and | When we compared the landforms in Seattle with the landforms in Atlanta, what did we find? | The map shows the directions east, west, north, and south. | east and south? |

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| | | predictions. | How were the landforms the same? What evidence did we find? | Both places had some flat land. | |
| | | | | They both had some hills. They both had | |
| | | | How were the landforms in Seattle different from the landforms in Atlanta? What evidence did we find? | Seattle had a lot more water than Atlanta. | How do you know Seattle had a lot more water? What did you see |
| | | | What other landform differences did you notice between the two places? | There was a lot of blue around Seattle. But Atlanta had only one big river. Seattle had big mountains around it. | on the map? |
| | | | | The map had high bumps around | How do you know there were mountains around Seattle? |

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| | | Select content representations and models matched to the learning goal and engage students in their use. | Today you'll work in your small groups from last time to investigate landforms in two new places on your relief maps: Chicago, Illinois, and Salt Lake City, Utah. Do you think the landforms in these places will be the same or different? What do you notice about the name Salt Lake City? What landforms do you think you might find there? NOTE TO TEACHER: Have students gather in their small groups from the previous lesson and give each group a plastic relief map of the United States. Then distribute handout 2.4 (Land Detectives, Part 2) to each student. Show slide 6. | Seattle. Atlanta was kind of flat and didn't have any big mountains. Because the bumps on the map weren't high like in Seattle. | How could you tell that Atlanta didn't have any big mountains? |

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| | | Highlight key science ideas and focus question throughout. | Like last time, you'll find each place on your relief map and identify the landforms. Make sure to touch the map to help you find the landforms. Think about whether the landforms in both places are similar or different; then record the landforms on the Venn diagram on your handouts. In the middle circle on the diagram that says "Both," list the landforms that are the same in each place. Then list the landforms that are different in the two other circles. Also look for two pieces of evidence on the relief map that will help us answer the focus question on the handout: <i>How does the land on Earth's surface look different</i> <i>in different places</i> ? Your evidence can include examples of landforms you see in each place. | | |
| 15 min | Activity Synopsis: As land detectives, students work in groups to investigate landform characteristics and patterns in two new locations in the United States using relief maps and Venn diagrams. Main science idea(s): • Some places on Earth have landforms like | | NOTE TO TEACHER: Continue displaying slide 6 throughout the activity. Before you begin working on this investigation in your small groups, let's find Chicago and Salt Lake City on the relief map. NOTE TO TEACHER: You may also want to display handout 2.3 (Map of the United States) on a document reader and point out Chicago and Salt Lake City on the map. | | |

| Time | Phase of Lesson and How the Science Content Storyline Develops | STeLLA Strategy | Teacher Talk and Questions | Anticipated Student Responses | Possible Probe/Challenge Questions |
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| | mountains, hills, or plateaus that rise high above Earth's surface, while other places have valleys and canyons that cut into the surface. Some places, like plains, are flat and change very little in elevation, and other places have bodies of water, such as rivers and lakes, that are part of the landscape. | Engage students in using and applying new science ideas in a variety of ways and contexts. Engage students in analyzing and interpreting data and observations. | Now you may begin your investigation. As land detectives, work together to find the landforms in each place and complete the handout. NOTE TO TEACHER: As groups work together, circulate around the room and ask them about the landforms and evidence they're finding. Since working with relief maps is a new skill for students, provide additional support if they're struggling to identify the correct landforms. Remind students to look at the landform pictures and descriptions on the word wall for help as they work to complete the handout. | | |
| 5 min | Follow-Up to Activity Synopsis: Students analyze the landforms they identified on their relief maps, comparing similarities and differences between the two locations. Main science idea(s): Landforms, including bodies of water, can differ from one place to another. Relief maps | Engage students in analyzing and interpreting data and observations. | Show slide 7. Now let's answer the questions on the slide based on evidence from our relief maps and Venn diagrams. 1. How are the landforms in Chicago and Salt Lake City the same? 2. How are they different? ELL support: It might be easier for ELL students to participate in the discussion if these questions are answered separately. | | |
| | can help us compare and contrast landforms | | NOTE TO TEACHER: Record student observations on chart paper during this | | |

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| | in different places in the United States. | Engage students in communicating in scientific ways. | discussion. What did your group find when you compared both places on the relief map? How do you think Chicago and Salt Lake City are the same? How are they different? Make sure to include evidence from the map. Listen carefully as each group shares their findings and be ready to agree or disagree, ask questions, or add on. What other comparisons would you like to share? Remember to use evidence from your relief map and Venn diagram. Stop Listen to students' ideas. What's visible about student thinking? | Our group thinks Salt Lake City is really bumpy, but Chicago is flat. Both places have lakes, so that's one landform that's the same. | What do you mean by "bumpy"? What do you mean by "flat"? What is the landform name for "flat"? |
| 8 min | Synthesize/Summarize Today's Lesson | | Show slide 8. | | |
| | Synopsis: Students revise their answers to the focus | Highlight key science ideas and focus | Our focus questions for today's lesson are How does the land on Earth's surface look different in different places? How can | | |

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| | questions using the new evidence they gathered about landforms in two new locations. Then the teacher reviews key science ideas about landforms. Main science idea(s): Landforms, including bodies of water, can differ from one place to another. Some places have landforms like mountains, hills, or plateaus that rise high above Earth's surface, while other places have valleys and canyons that cut into the surface. Some places, like plains, are flat and change very little in elevation, and other places have bodies of water, such as rivers and lakes, that are part of the landscape. Relief maps can help us compare and contrast landforms in different places. | question throughout. Engage students in constructing explanations and arguments. | representations like relief maps help us compare different places in the United States? What ideas do you have for answering our second focus question? How did the relief map help you find different landforms in the United States? Show slide 9. Embedded Assessment Task Next, I'd like you to think about the first focus question again. What new pieces of evidence did you gather from today's investigation that will help us answer this question? I'd like you to write a new answer for this question in your science notebooks based on all of the evidence you've gathered over the past two days. Use the sentence starter on the slide: I think the land on Earth's surface [does/does not] look different in different places because Make sure to circle does or does not to show which answer you've chosen. | | |

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| | | Summarize key science ideas. | NOTE TO TEACHER: Give students a few minutes to write their responses. Whole-class share-out: Who would like to share your explanation and evidence with the class? ELL support: Give ELL students time to practice sharing their sentences with a partner in a Turn and Talk before sharing them with the class. Let's review what we've learned about landforms in our relief-map investigations over the past two lessons. Show slide 10. Some places on Earth have landforms like mountains, hills, or plateaus that rise high | I think the land <i>does</i> look different in different places because some places on the map have mountains and other places don't. I think the land <i>does</i> look different in different places because some places on the map have a lot of rivers and water, but other places are really jagged and rough and don't have a lot of water or rivers. | |

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| | | | above the surface. Show slide 11. Other places have valleys and canyons that cut into Earth's surface. Show slide 12. Some places are flat with very little change in elevation, like plains. Show slide 13. Some places have many bodies of water, like rivers and lakes, and other places don't. So based on this evidence, can we all agree that the land looks different in different places? | | |
| 1 min | Link to Next Lesson Synopsis: The teacher announces that in the next lesson, students will think about whether landforms ever change. | Link science ideas to other science ideas. | Show slide 14. From our relief-map investigations, we know that Earth's surface has many types of landforms. We also know the land looks different in different places. Next time, we'll think about the question, <i>Do landforms ever change?</i> | | |

| | Optional ELA Extension | | | | | | |
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| 3 min | Setup for Activity Synopsis: The teacher introduces a short story about landforms that students will read and add to using descriptions and drawings of landforms in their own community. Main science idea(s): The surface of Earth has many features called <i>landforms</i>. Natural landforms are different from the things people build on top of the land, such as houses, schools, buildings, and roads. They're also different from things that grow on the land, such as trees and plants. | Ask questions to elicit student ideas and predictions. Make explicit links between science ideas and activities before the activity. | We have been talking about landforms in our unit on Earth's changing surface. Can someone tell me what landforms are? So landforms are the different features we see on the land, such as mountains, valleys, and rivers. This week, we'll learn about many different types of landforms. Today we'll read a short story about different places around the United States. The story describes the landforms in these places. You'll read about each place and look at pictures of the landforms found there. After reading the story, you'll add a description of landforms in our area and draw pictures of three landforms. | They're part of the land or the way the land is shaped. They're things like mountains. | Can you describe the shape of a mountain? | | |
| 30 min | Activity Synopsis: Students read a story about places in the United States and what landforms look like in these places | | NOTE TO TEACHER: Distribute handout2.2 (Landforms).Can someone tell me the title of our booklet?What do you think we will read about? | Landforms. | | | |

| | Optional ELA Extension | | | | | |
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| | Then they finish the story by writing a description and drawing pictures of landforms in their community. Main science idea(s): Landforms include mountains, hills, plateaus, valleys, plains, or canyons. Landforms also include bodies of water, such as lakes, rivers, deltas, and features that are formed where the oceans meet land, such as bays and peninsulas. | Make explicit links between science ideas and activities during the activity. | OK, let's begin our story. NOTE TO TEACHER: Choose the most appropriate reading strategy for your students. You could have them read the story aloud as a whole class, in small groups, or independently. After students read about each place, stop and discuss the landforms underlined in the story. Ask students to locate the different landforms in the pictures and describe what they see. You could even have them label the landforms in the pictures. Now that we've read about several places in the United States, it's your turn to write describe the landforms in our area. Turn to the last page of the booklet and write a description of the landforms in our community. Then turn to the previous page and draw pictures of three landforms you described in your essay. When I say "landforms in our community," I'm talking about the area within a short drive from where you live. This can be landforms you see from school or from your home, but it can also be landforms a short distance away from where you live. NOTE TO TEACHER: For their descriptions, students should choose an area in Southern California, preferably in the LA | mountains and valleys. | | |

| | Optional ELA Extension | | | | | |
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| Time | Phase of Lesson and How the Science Content Storyline Develops | STeLLA Strategy | Teacher Talk and Questions | Anticipated Student Responses | Possible Probe/Challenge Questions | |
| | | | metropolitan area. You may want to include a sentence starter for students to use, such as "The landforms I see in my community are,, and" Then have students use adjectives to describe these landforms (e.g., tall, short, high, long, wide, deep, low, rocky, smooth). CONTENT NOTE: Students in the LA metropolitan area might be more familiar with rivers and streams that run through concrete flood-control channels rather than natural streambeds. It's important to help them distinguish between natural landforms and concrete channels that people have made. However, keep in mind that these concrete channels water shed. All watersheds are landforms, even those within city limits. Major watersheds in the Los Angeles River, the San Gabriel River, and the Santa Ana River. | | | |
| 5 min | Follow-Up to Activity Synopsis: Students share their new ideas about landforms using examples from their community and from the reading. | Make explicit links between science ideas and activities after the activity. | Who would like to read what you wrote about the landforms in our community and share your pictures with us? NOTE TO TEACHER: Encourage as many students as possible to share their writings and drawings with the class. | I wrote that we have mountains and hills in our community. I wrote about valleys | How did you describe the mountains? | |

| | Optional ELA Extension | | | | | |
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| 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): Landforms include mountains, hills, plateaus, valleys, plains, and canyons. Bodies of water, such as lakes, rivers, and deltas, are also landforms, as well as bays and peninsulas where oceans meet the land. | | | and flat areas. I wrote about the rivers that run through my neighborhood. | Are these rivers part of the natural land, or are they concrete channels? Do you think the concrete channels with water flowing through them are a landform? Why or why not? | |
| | | Engage students in communicating in scientific ways. | Now that we've read about landforms in several places, what do you think? Are landforms different in different places? | I think all of these places are different. Some have mountains, but some don't. But sometimes they have the same thing, like many places have rivers. | Does anyone disagree or want to add on? | |
| | | Ask questions to elicit student ideas and predictions. | Do you think the places we read about today have always looked this way? | I think so. | Can you tell us more about why you think | |

| | Optional ELA Extension | | | | | | | |
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| Time | Phase of Lesson and How the Science Content Storyline Develops | STeLLA Strategy | Teacher Talk and Questions | Anticipated Student Responses | Possible Probe/Challenge Questions | | | |
| | | | Thank you for sharing your writings and drawings! Next time, we'll think about whether landforms ever change. | I think maybe they change, like when a volcano explodes! | so? | | | |