

Earth's Changing Surface

Lesson 2: Landform Detectives

Grade: 2	Length of lesson: 50 minutes	Placement of lesson: 2 of 6 lessons in the Earth's changing surface lesson series.
Unit Central Questions: What does the surface of Earth look like? Does it ever change?		Lesson Focus Questions: How does the land look different in different places?
Main learning goal: Landforms and bodies of water look different in different places.		
Science content storyline: Landforms can be different from one place to another. Some places have landforms like mountains, hills, or plateaus that rise high above the surface while other places have valleys and canyons that cut into the surface of Earth. Still other places, like plains, are flat with very little change in elevation, and other places have bodies of water, such as rivers and lakes, that are part of the landscape.		
Ideal student response to the Focus Question: Landforms look different in different places. Some places have mountains that rise high above Earth's surface and other places have valleys or canyons that cut into Earth's surface. Some places are very flat. Some places have many bodies of water while other places have very few bodies of water. The land doesn't look the same everywhere.		

Preparation

MATERIALS NEEDED	AHEAD OF TIME
<p>Teacher Masters:</p> <ul style="list-style-type: none"> Lesson 2 PowerPoint <p>Student Handouts:</p> <ul style="list-style-type: none"> 2.1 Land Detectives – 1 per student <p>Other Materials:</p> <ul style="list-style-type: none"> 2.3 Plastic Relief Maps of the United States – 1 per group Map of the US on the wall <p>Optional: <i>For use to ELA Time</i></p> <ul style="list-style-type: none"> 2.2 <i>Landforms</i> Reading with supplemental US Map – 1 each per student 	<ul style="list-style-type: none"> Review the information in the Content Background document. Prepare all handouts and relief maps. Optional: Prepare reading for English Language Arts, if time allows in your curriculum.

Lesson 2 General Outline

Time	Phase of lesson	How the Science Content Storyline Develops
3 min	Link to Previous Lesson: Students review landforms and bodies of water from Lesson 1.	There are many different types of landforms and bodies of water.
2 min	Lesson Focus Questions: Teacher introduces the Lesson Focus Question: <i>How does the land look different in different places?</i>	
15 min	Setup for Activity: Teacher sets-up an activity for students to investigate patterns in landforms in different locations.	Maps can be used to locate different places on Earth and study the characteristics and patterns in landforms of that place.
25 min	Activity: Students investigate patterns in landforms as land detectives. They explore different places and describe the types of landforms that are found in those places. Then they compare similarities and differences.	Some places have landforms like mountains, hills, or plateaus that rise high above the surface while other places have valleys and canyons that cut into the surface of Earth. Still other places, like plains, are flat with very little change in elevation, and other places have bodies of water, such as rivers and lakes, that are part of the landscape.
9 min	Follow-up to Activity: Students analyze the patterns they found from observations and develop conclusions, using evidence, that the land is not the same everywhere.	Landforms can be different from one place to another.
5 min	Summarize and Synthesize: Teacher summarizes key science ideas from the lesson.	Some places have landforms like mountains, hills, or plateaus that rise high above the surface while other places have valleys and canyons that cut into the surface of Earth. Still other places, like plains, are flat with very little change in elevation, and other places have bodies of water, such as rivers and lakes, that are part of the landscape. Landforms and bodies of water can be different from one place to another.
1 min	Link to Next Lesson: Teacher links to next lesson by asking students to think about whether landforms and bodies of water ever change?	The land hasn't always looked like it does today. It is changing all the time.

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3 min	<p>Link to previous ideas</p> <p><u>Synopsis:</u> Students review landforms from Lesson 1.</p> <p><u>Main science ideas:</u> There are many different types of landforms.</p>	Ask questions to elicit student ideas and predictions	<p>Yesterday we learned that the different features we see on our natural land are called landforms.</p> <p>We are going to take a minute to think about landforms in our community and other places.</p> <p>NOTE TO TEACHER: Show Lesson 2 PowerPoint pictures and ask students to think about whether it is a landform or not, and if it is something they can see in their community.</p> <p>Is this a landform? How do you know?</p> <p>Do we have this landform in our community?</p>	<p>The mountain is a landform because it is part of the natural land.</p> <p>The road is not a landform because it is made by people.</p> <p>I see mountains here.</p> <p>We do not have canyons here.</p>	

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			<p><i>use evidence from the raised relief maps and the book from Lesson 1 to describe the differences in landforms in different places and patterns they notice.</i></p>	<p>about other places that were different.</p>	
15 min	<p>Set up for Activity</p> <p><u>Synopsis:</u> Teacher sets-up an activity for students to investigate patterns in landforms in different locations.</p> <p><u>Main science ideas:</u> Maps can be used to locate different places on Earth and study the characteristics and patterns in landforms of that place.</p>	<p>Ask questions to elicit student ideas and predictions.</p> <p>Select content representations and models matched to the learning goal and engage students in their use.</p>	<p>Today we are going to use some special maps to explore different types of landforms and bodies of water.</p> <p>NOTE TO TEACHER: <i>Hold up the plastic relief map of the United States for students to see.</i></p> <p>What is different about this map compared to other maps you have seen?</p> <p>NOTE TO TEACHER: <i>Point to US Map (or another map) that you have on the wall.</i></p> <p>That’s right. This map shows where landforms are located. It shows how high the land is in some areas and how low the land is in other areas. It can show us where the land is flat too. Scientists call this a “relief map.” Scientists call how high or low the land is, elevation. High elevation means the land is really tall and rises above the surface of Earth. Low elevation means the land is really low or flat and it is about the same level as the oceans.</p>	<p>It’s bumpy. It’s not flat.</p>	

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			<p><i>NOTE TO TEACHER: Write the word “elevation” on the board. Also, give each group a large plastic relief map of the United States. Students will get really excited to look at the map, so give them 2-3 minutes to feel it and talk about it before moving on (otherwise they will be distracted while you model for them what they will be doing). Before starting the activity, as a whole class, ask students to identify landforms on the plastic relief map. Some students might not have seen a map like this before and will need some orientation to how landforms appear on the map (which is different than looking at pictures of landforms from Lesson 1). Students might also need some orientation to finding places, such as Pomona, on the map.</i></p> <p>Can anyone show me where they see high elevation on the map? What are these called? Use our names for landforms.</p> <p>What about places with low or flat elevation? Can you find an example of that? What do we call those landforms?</p> <p>Can anyone find a place on the map that cuts into the surface of Earth? What do we call those landforms?</p>	<p>Mountains Hills</p> <p>Plains</p> <p>Canyons</p>	

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		Highlight key science ideas and focus question throughout.	<p>What about Pomona? Can you point to where Pomona is on this map? Can you see the landforms around Pomona?</p> <p>Today you will work with your team members to be land detectives and investigate the land in two different places to find out how the land might be similar or different. You will be looking for evidence on the relief map to answer the focus question today: How does the land look different in different places?</p> <p>NOTE TO TEACHER: <i>Pass around Land Detectives handout to each student. Consider cutting the handout to make it small and then gluing into the students' science notebooks.</i></p> <p>In your groups, you will explore two locations on the relief map and decide if there are similar or different landforms in those places. At each of the two locations, study the map closely and find two pieces of evidence to answer our focus question [<i>point to focus question on handout</i>]. Your evidence can include examples of</p>	<p>Valleys</p> <p>There are mountains in Pomona.</p> <p>But it is also flat too.</p>	

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			<p>landforms that you see in the different places. Let me give you an example.</p> <p><i>NOTE TO TEACHER: Using a Venn diagram on the board, choose a location such as Seattle, WA. Demonstrate for students the type of landforms you see in Seattle, and write them on the diagram (e.g., mountains, rivers and lots of water). Then repeat the same demonstration for Atlanta, GA (e.g., plains, hills, river with some water). Then model how to support your answer to the question with evidence: “My answer to the question might be that the land is different between Seattle and Atlanta. My first evidence is that in Seattle there are lots of tall mountains but in Atlanta there are not any mountains. It is flat with some hills. My second piece of evidence is that there are lots of bodies of water close to Seattle, but Atlanta only has a few rivers and maybe a lake- it has a lot less water. Using these two pieces of evidence, I think that the land in Seattle is different in Atlanta because the land in Seattle rises high above Earth surface and has lots of bodies of water, but the land around Atlanta is mostly flat or hilly and doesn’t have much water.</i></p>		
15 min	Activity	Engage students in	Using the process I just modeled for you, your team create a new diagram to record		

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	<p><u>Synopsis:</u> Students investigate patterns in landforms as land detectives. They explore different places and describe the types of landforms that are found in those places. Then they compare similarities and differences.</p> <p><u>Main science ideas:</u> Some places have landforms like mountains, hills, or plateaus that rise high above the surface while other places have valleys and canyons that cut into the surface of Earth. Still other places, like plains, are flat with very little change in elevation, and other places have bodies of water, such as rivers and lakes, that are part of the landscape.</p>	analyzing and interpreting data and observations.	<p>evidence for your two locations and then think about how the two places are similar or different.</p> <p>The two places you will study today are Chicago, Illinois and Salt Lake City, Utah. Let's first write those on our <i>Land Detectives</i> handout. For Location 1, write "Chicago" and for Location 2, write "Salt Lake City" [give time for students to write locations on their handout]. Now let's find those places on the relief maps [help students locate the places on the maps]. Now, in your groups, study the landforms you see in each place. Write down the landforms for Chicago and the landforms for Salt Lake City. Then think about how these two places are similar and how they might be different.</p> <p>NOTE TO TEACHER: Remind students of the Landforms Word Wall to help them think about which landforms they might see in each place and to help them write the landforms names onto the handout.</p> <p>Circulate around the groups and ask students what evidence they are finding. Students may struggle with identifying the correct landforms, particularly if this is the first time they have used a relief map. Also, be sure to help students find the right</p>		

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			<p>What about other groups? What evidence and comparisons can you make?</p> <p><i>NOTE TO TEACHER: Let several groups report their findings.</i></p> <p> Listen to students' ideas. What's visible about student thinking?</p> <p>Now, let's take a moment to look at the whole map.</p> <p>Does anyone notice any patterns in where some landforms are located compared to others? For example, where do you notice the land being higher on the map? Where do you notice it being lower? Is the land more rough or jagged in some parts of the United States compared to other places?</p>	<p>same.</p> <p>I see that all the mountains and rough land is on this side and the other side of the map is flat.</p> <p>Maybe that there are lots of canyons and</p>	<p>bumpy? What do you mean by flat? What is that called?</p> <p>What do you think the rough land shows us?</p>

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			<p>OK, does anyone else see a pattern they would like to share?</p> <p>It is important for us to think about patterns we notice in where landforms are located. Scientists study these patterns and try to figure out why some places are full of mountains and others have none. Finding patterns helps scientists think about processes that cause certain landforms to appear in some places, but not others and then scientists can study these processes.</p>	<p>mountains and bumpy land in this part of the US.</p> <p>There are more rivers on this side of the map and not that many on the other side.</p>	
5 min	<p>Summarize/Synthesize</p> <p><u>Synopsis</u>: Teacher summarizes key science ideas from the lesson.</p> <p><u>Main science ideas</u>: Some places have landforms like</p>		<p>Now that you have had time to explore the relief maps, I want you to think about our focus question today, How does the land look different in different places? Use the evidence you have gathered to explain your answer.</p> <p><i>Embedded assessment task.</i></p>		

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	<p>mountains, hills, or plateaus that rise high above the surface while other places have valleys and canyons that cut into the surface of Earth. Still other places, like plains, are flat with very little change in elevation, and other places have bodies of water, such as rivers and lakes, that are part of the landscape. Landforms and bodies of water can be different from one place to another.</p>		<p> In your science notebooks, complete the sentence:</p> <p>I think the land <u>does/does not</u> look different in different places because _____.</p> <p><i>NOTE TO TEACHER: Give students several minutes to write their responses.</i></p> <p>Now, would anyone like to share their conclusions?</p> <p>Okay, so today we explored special maps, called relief maps, that let us view different landforms. It also helps us identify patterns</p>	<p>I think the land is different in different places because my evidence showed that some places have mountains and other places don't.</p> <p>I think the land does look different in different places because some places have lots of rivers and water and other places are really jagged and rough, but don't have many rivers.</p>	

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			<p>of where landforms are located.</p> <p>We learned that</p> <ul style="list-style-type: none"> • Some places have landforms like mountains, hills, or plateaus that rise high above the surface. • Other places have valleys and canyons that cut into the surface of Earth. • Some places are flat with very little change in elevation, like plains. • Some places have many bodies of water, such as rivers and lakes, while others do not. <p>Based on this evidence, we can agree that</p> <ul style="list-style-type: none"> • Landforms can be different from one place to another. <p><i>NOTE TO TEACHER: Write this science idea on the board.</i></p>		
1 min	<p>Link to Next Lesson</p> <p><u>Synopsis:</u> Teacher links to next lesson by asking students to think about whether landforms ever change?</p>		<p>So now we have learned that we have many different types of landforms on Earth's surface. We also know that landforms are different from one place to the next.</p> <p>Tomorrow we will think about whether or not landforms ever change.</p>		

Optional ELA Extension

Time	Phase of lesson and How the Science Content Storyline develops	STeLLA Strategy	Teacher talk and questions	Anticipated student responses	Possible Probe/Challenge Questions
3 min	<p style="text-align: center;">Set up for Activity</p> <p><u>Synopsis</u>: Teacher introduces a short story and gives students information about how to read the story and then add to the story with words and pictures about landforms in their own community.</p> <p><u>Main science ideas</u>: The natural landscape on Earth has many different features. We call these different features, landforms. Natural landforms are different from the things that people build on top of the land, such as homes, schools, buildings, and roads.</p>	Ask questions to elicit student ideas and predictions.	<p>Remember, scientists call the features of the natural land, landforms. Can anyone tell me what landforms are?</p> <p>Landforms are the different features that we see on the land, such as mountains, valleys, and rivers. There are lots of different types of landforms we will learn about this week.</p> <p>Today we will read a short story about different places around the United States. The story describes the landforms in these places. You will read about each place and also look at pictures of the landforms that can be found there. After you read the story, you will complete the story with a description of landforms in our area.</p>	It is the way the land is shaped. Things like mountains.	Can you describe the shape to me?
30 min	<p style="text-align: center;">Activity</p> <p><u>Synopsis</u>: Students read a story about places in the United States and what landforms look like in these places. Then they finish the story by creating a description and drawings of their community.</p>	Make explicit	<p>NOTE TO TEACHER: Pass around a Landforms reading for each student.</p> <p>Can someone tell me the title of our book today?</p> <p>What do you think we will read about?</p> <p>Ok, let's begin reading.</p>	<p>Landforms.</p> <p>I think we will read about mountains and valleys.</p>	

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	<p><u>Main science ideas:</u> 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.</p>	<p>links between science ideas and activities (during the activity)</p>	<p>NOTE TO TEACHER: Choose the most appropriate reading strategy used in your classroom. You could have students read the story aloud as a whole class, in small groups, or silently. After each place, be sure to stop the students and discuss the landforms for that place. Ask the students to locate the landforms in the pictures and describe what they see. They can even label the landforms in the pictures.</p> <p>Now that we have read about several other places in the United States, it is your turn to describe our area. You will finish the book with your own description of the landforms in our community and three drawings of landforms that you see.</p> <p>By our community, I am talking about the area within a short drive from where we live. This can be landforms you see from our school or from your home, but can also be landforms a short distance away from where we live.</p> <p>NOTE TO TEACHER: Students will finish the story by writing a similar description of their place and drawing/coloring illustrations of three landforms they see in the local area (preferably students will stick with landforms in southern California around the LA Metro area). In order to help students with the writing activity, consider providing sentence</p>		

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			<p><i>starters, such as: “The landforms I can see in my community are ____, ____, and _____. They are tall/long/rocky/other adjectives.</i></p> <p><i>Content Note: Students in the urban Los Angeles metropolitan area might be more familiar with rivers and streams that run through concrete flood-control channels rather than natural stream beds. It will be important to distinguish for them that concrete channels are human-made, and therefore are not considered natural landforms. However, these were once free-flowing rivers and tributaries before the concrete channels were made and still are part of a natural river system referred to as a "watershed". Watersheds are "landforms" and every location in the landscape (even within cities) belongs to a particular watershed. Major watersheds in the Los Angeles area include the Los Angeles River, San Gabriel River, and Santa Ana River.</i></p>		
5 min	<p>Follow-up Activity</p> <p><u>Synopsis:</u> Students share their new ideas about landforms using examples from their community and from the reading.</p> <p><u>Main Science Idea:</u> Landforms include mountains, hills, plateaus, valleys, plains, or canyons. Landforms also include</p>	Make explicit links between science ideas and activities (after the activity)	Now that you have thought about the landforms in our area, would someone like to read what they wrote?	<p>I wrote that we have mountains and hills.</p> <p>I wrote about valleys and flat areas.</p> <p>I wrote about the rivers that run through my neighborhood.</p>	<p>How did you describe the mountains?</p> <p>Are these rivers part of the natural land, or are they concrete channels?</p>

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	bodies of water, such as lakes, rivers, deltas, and features that are formed where the oceans meet land, such as bays and peninsulas.		<p>We have read all about the landforms in different places. So what do you think- are landforms different in different place?</p> <p>Do you think the places we read about today have always looked this way?</p> <p>Ok, well tomorrow we are going to think more about this and ask ourselves, do landforms ever change?</p>	<p>I think all these places are different. Some have mountains, but some do not.</p> <p>But sometimes they have the same thing, like lots of places have rivers.</p> <p>I think so.</p> <p>I think maybe they change, like when a volcano explodes!</p>	<p>Do you think the concrete channels that water flow through is a landform?</p>