Lesson 2.3
Rock-Forming Environments
Lesson Overview

In this lesson, students read about, consider details of, and model sedimentary rock formation in different environments. Students begin the lesson by reading and recording information about the different kinds of sediment that form different kinds of rock and why these sediments build up in different environments. Students add a new layer to their Sedimentary Rock Formation Models, showing two different kinds of sedimentary rock, to apply what they learned about what makes sedimentary rock different and how different rock forms in different environments. Finally, students reflect on what they’ve learned by returning to the Rocks and Fossils anticipatory chart and engaging in a short reflective writing activity in response to the question *How do rocks provide information about what an environment was like in the past?* The purpose of this lesson is for students to further build the understanding that different sedimentary rock forms in different environments.

**Anchor Phenomenon:** A rocky outcrop in Desert Rocks National Park has a fossil in it.

**Investigative Phenomenon:** There are different kinds of sedimentary rock.

**Students learn:**

- Different sediments build up in different environments. Therefore, different kinds of sedimentary rock form in different environments.
Environments in Fossil Hunter’s Handbook

Students read in Fossil Hunter’s Handbook to learn why different sediment builds up in different environments.

Instructional Guide

1. Summarize previous lesson and set purpose for this lesson.

   Remember that we are investigating the question *How do rocks provide information about what an environment was like in the past?* In our previous lesson, we learned that different sediment builds up in different environments, so different rock forms in different environments. Now we’re going to focus on *why* sediment builds up in different environments to begin with.


   You will use Fossil Hunter’s Handbook to read more about how sediment can be different from one another and why different sediment builds up in different environments.

3. Introduce notebook page 31. Have students turn to notebook page 31, Reading About Rocks and Sediment. Project the notebook page on the board. Review the instructions and make sure that students understand how to complete the table.

4. Have students read in Fossil Hunter’s Handbook. Remind students they only need to read about the kinds of rocks in the table on page 31 in the notebook, so they should use the index to find the correct pages to read.

5. Students complete the notebook page. Have students work with their partners to complete the rest of the table and answer the questions on the notebook page.

6. Lead students in a whole-class discussion.
Teacher Support

Instructional Suggestion

Providing More Experience: Today's Daily Written Reflection

Why do you think geologists use models? This prompt (on page 30 of the Investigation Notebook) asks students to think about what they already know about why a geologist might use a model. The purpose of this prompt is to initiate students' prior knowledge about why models are useful in science, especially to geologists. Students will learn through various experiences in the unit that models help them observe phenomena that are difficult to observe in real life.

Rationale

Pedagogical Goals: Water Speed

This lesson gives students some experience with the idea that the speed of water in an environment is one thing that determines the size of the sediment that builds up there. This is not a specific learning goal of the unit, but was included to help make the idea that different sized sediment builds up in different environments more concrete for students.

Possible Responses

Rock: conglomerate, Page 34
Sediment: pebbles, larger rocks, and sometimes sand
Size of sediment: large
How is the sediment carried?: by fast-moving water

Rock: mudstone, Page: 36
Sediment: clay
Size of sediment: tiny
How is the sediment carried?: slow-moving water
**Rock:** sandstone, Page: 38

**Sediment:** sand

**Size of sediment:** medium

**How is the sediment carried?** somewhat fast-moving water

**How are sediments different from one another?**
Different sediment is different sizes.

**Why does different sediment build up in different environments?**
Different sediment builds up in different environments because the speed of the water is different.
Reading About Rocks and Sediment

Using *Fossil Hunter’s Handbook*, read about why different sediment builds up in different environments. Record the information you find in the table below.

<table>
<thead>
<tr>
<th>Rock</th>
<th>Sediment</th>
<th>Size of sediment</th>
<th>How is the sediment carried?</th>
</tr>
</thead>
<tbody>
<tr>
<td>conglomerate</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Page:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>mudstone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Page:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sandstone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Page:</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

How are sediments different from one another?
___________________________________________________________________
___________________________________________________________________

Why does different sediment build up in different environments?
___________________________________________________________________
___________________________________________________________________
Environments in Fossil Hunter’s Handbook

Students read in *Fossil Hunter’s Handbook* to learn why different sediment builds up in different environments.

Instructional Guide

1. Summarize previous lesson and set purpose for this lesson.

   Recuerden que estamos investigando la pregunta ¿Cómo es que las rocas proporcionan información sobre cómo era un ambiente en el pasado? En nuestra lección anterior, aprendimos que diferentes sedimentos se acumulan en diferentes ambientes, así que diferentes rocas se forman en diferentes ambientes. Ahora vamos a enfocarnos en por qué se acumulan los sedimentos en diferentes ambientes en primer lugar.

2. Distribute *Fossil Hunter’s Handbook*.

   Usarán el *Manual del buscador de fósiles* para leer más sobre cómo los sedimentos pueden ser diferentes unos de otros y por qué diferentes sedimentos se acumulan en diferentes ambientes.

3. Introduce notebook page 31. Have students turn to notebook page 31, Reading About Rocks and Sediment. Project the notebook page on the board. Review the instructions and make sure that students understand how to complete the table.

4. Have students read in *Fossil Hunter’s Handbook*. Remind students they only need to read about the kinds of rocks in the table on page 31 in the notebook, so they should use the index to find the correct pages to read.

5. Students complete the notebook page. Have students work with their partners to complete the rest of the table and answer the questions on the notebook page.

6. Lead students in a whole-class discussion.
Teacher Support

Instructional Suggestion

Providing More Experience: Today’s Daily Written Reflection

Why do you think geologists use models?
This prompt (on page 30 of the Investigation Notebook) asks students to think about what they already know about why a geologist might use a model. The purpose of this prompt is to initiate students’ prior knowledge about why models are useful in science, especially to geologists. Students will learn through various experiences in the unit that models help them observe phenomena that are difficult to observe in real life.

Rationale

Pedagogical Goals: Water Speed
This lesson gives students some experience with the idea that the speed of water in an environment is one thing that determines the size of the sediment that builds up there. This is not a specific learning goal of the unit, but was included to help make the idea that different sized sediment builds up in different environments more concrete for students.

Possible Responses

Rock: conglomerate, Page 34
Sediment: pebbles, larger rocks, and sometimes sand
Size of sediment: large
How is the sediment carried?: by fast-moving water
Rock: mudstone, Page: 36
Sediment: clay
Size of sediment: tiny
How is the sediment carried?: slow-moving water

Rock: sandstone, Page: 38
Sediment: sand
Size of sediment: medium
How is the sediment carried?: somewhat fast-moving water

How are sediments different from one another?
Different sediment is different sizes.

Why does different sediment build up in different environments?
Different sediment builds up in different environments because the speed of the water is different.
Usando el *Manual del buscador de fósiles*, lee sobre por qué diferentes sedimentos se acumulan en diferentes ambientes. En la tabla debajo, apunta la información que encuentres.

<table>
<thead>
<tr>
<th>Roca</th>
<th>Sedimento</th>
<th>Tamaño del sedimento</th>
<th>¿Cómo es llevado el sedimento?</th>
</tr>
</thead>
<tbody>
<tr>
<td>conglomerado</td>
<td>Página:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>mudstone</td>
<td>Página:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>arenisca</td>
<td>Página:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

¿En qué son diferentes unos de otros los diferentes sedimentos?
___________________________________________________________________
___________________________________________________________________

¿Por qué diferentes sedimentos se acumulan en diferentes ambientes?
___________________________________________________________________
___________________________________________________________________