GENERATIONGENIUS
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LESSON PLAN

EARTH'S LANDSCAPES
GRADES 3-5

SUMMARY

In this lesson students will explore their own landscape for evidence to determine whether it has changed or remained the same over time. Students observe a similar investigation in another location, and then use local resources to learn more about where they live.

NEXT GENERATION SCIENCE STANDARDS CORRELATION

4-ESS1-1. Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time.

Science & Engineering Practices	Connections to Classroom Activity
Constructing Explanations and Designing Solutions **Analyzing and Interpreting Data**	• Students seek evidence that helps explain what their present landscape was like in the past. • Students use rock and fossil evidence to build a model of what their landscape was like in the past.
Disciplinary Core Ideas	**Connections to Classroom Activity**
ESS1.C: The History of Planet Earth • Local, regional, and global patterns of rock formations reveal changes over time due to earth forces, such as earthquakes. The presence and location of certain fossil types indicate the order in which rock layers were formed. (4-ESS1-1)	• Students observe rock and fossil evidence that supports an explanation that a high desert/plains landscape was once under the sea. • Students research rock and fossil evidence to help them understand the history of their own landscape.

LS4.A: Evidence of Common Ancestry & Diversity	
• Fossils provide evidence about the types of organisms that lived long ago and also about the nature of their environments. (3-LS4-1)	
Crosscutting Concepts	**Connections to Classroom Activity**
Patterns **Connections to Nature of Science** **Scientific Knowledge Assumes an Order and Consistency in Natural Systems** **Scale, Proportion, and Quantity**	• Students observe rock layer patterns and learn about how the relative ages of those layers help us explain the history of the landscape. • Students learn about the Law of Superposition—undisturbed rock layers form consistent patterns that reflect the relative age of the rock (oldest to most recent, bottom to top) throughout history and in any location on Earth.

DURATION

Two or more 45-minute class periods (duration depends on field trips, classroom visits and time allotted for drawings.)

PRE-ASSESSMENT QUESTIONS

Please see Discussion Questions located under the video. These can be discussed as a group or answered individually in student science notebooks.

MATERIALS

- Science notebooks
- Pencils
- Internet access
- Books about local geology/topography (optional)
- Paper
- Drawing materials (crayons, colored pencils, markers)
- Materials to construct dioramas (shoe boxes and craft materials—optional)

ENGAGE

As a group, observe your local landscape. Depending on where you live, this could mean looking out the classroom window, hiking to the top of a hill, or a trip to the beach (if you live near one). Have students record observations about the landscape in their science notebooks. Encourage them to take the following observations into account:

- Topography—is it flat, hilly, or mountainous? Do you see canyons? Plains?
- Climate—is it cold or hot most of the year, or do you have seasons? Is it humid or dry?
- Water features—are there rivers, lakes, streams, ocean?
- Plants and animals—what types of plants and animals live naturally on this type of landscape?

EXPLORE

Ask students if they think the landscape has always looked the way it does today? Why or why not? Can they think of any evidence to support their answer? This may be confusing to students at this point, but the video will allow them to follow along as the team explores evidence to help explain changes in a specific landscape over time (in this case, Sharktooth Hill, CA which currently has plains, but fossil evidence indicates that the landscape was previously an ocean).

WATCH THE *GENERATION GENIUS EARTH'S LANDSCAPES* VIDEO AS A GROUP. THEN FACILITATE A CONVERSATION USING THE DISCUSSION QUESTIONS.

EXPLAIN

Now that students have a better idea about what types of evidence they might be looking for, do some research to find evidence as to whether or not your landscape was once different. This can be done with an online search or ideally a visit to a local natural history museum or a field trip. The goal should be for students to focus not only on determining what their landscape might have been like in the past, but to answer the following question, which focuses on evidence:

- *How do we know* what our landscape was like in the past?

Depending upon your location, evidence of past landscapes may be focused on rocks and/or fossils. Make sure to incorporate both if possible.

ELABORATE

By now, students should have gathered enough information to start to understand what their landscape looked like in the past. Students can create a drawing or model (diorama) that shows what the landscape looked like at a certain time in the past based on the evidence they have identified. For example, a drawing or diorama for the Sharktooth Hill landscape might be underwater and show marine life, both living and dead with sediment piling around bones.

EVALUATE

Ask students to either verbally explain or write in their science notebooks an explanation about why they included different things in their drawing or diorama, referencing the rock and/or fossil evidence they have learned about.

EXTENSIONS

Use the DIY Activity to create your own Sedimentary Rock Formation Model just like Zoë's from the video. Compare the model with actual sedimentary rock formations from your area (if you have sedimentary rock in your area.)