History Pages in Rock

Teacher		**Class**	Grade 4
Subject	Science	**Topic**	Rock layers and fossils
Date		**Room**	
Lesson length	60 minutes	**Country**	United States

Students learn how rock layers and fossils show how land changes. They draw a 3-layer cliff and use it to tell the Earth story.

Curriculum links

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

Learning objectives

- Students will order flat rock layers from oldest at bottom to youngest at top.
- Students will tell water or land habitats from shells, plants and footprints in rock.
- Students will explain landscape change using layer and fossil patterns as evidence.

Success criteria

- I can put oldest layers at the bottom and youngest on top.
- I can tell if a layer formed under water or on land from its fossils.
- I can tell how a place changed using rock and fossil clues.

What students already know

Ask who has seen flat stripes in rock or soil and what shells and leaves need to live. Take 3 quick answers.

Key words

strata	flat bands of rock piled one on top of another [3]
sedimentary rock	hard material made when tiny bits of sand and mud press together in flat bands [3] [11]
fossil	remains or marks of a plant or animal saved in rock [4][12]
evidence	clues you can see that help show what happened in the past
environment	the water or land around where a plant or animal lived

Materials

- Projector and Slides 1-5, 7, 9-12
- white paper
- colored pencils
- rulers
- printed three-box cliff template with bottom box labeled oldest
- Worksheet Task B copies (page 2) and Task D copies (page 4)

Before the lesson

- Print Worksheet Task B (page 2) and Task D (page 4) for each student
- Print three-box cliff template with bottom box labeled oldest for support
- Load Slides 1-5, 7, 9-12 and check pictures and words show clearly
- Set out white paper, colored pencils and rulers for groups of 4

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- Draw a finished 3-layer example cliff with shells low and leaves high to model

Lesson outline

0–8 min **Starter** 8 min · Whole class

Spark curiosity about sea fossils on land and link it to drawing a cliff story.

YOU DO

1. Show Slide 1 and read Rock Layers Are History Books and Using fossils to tell how land changes.
2. Show Slide 4 and read Seashell fossils can sit high on dry land! and It means that land was once under the ocean.
3. Show Slide 5 mystery Swirly shell in rock, far from water. Why? and let pairs whisper ideas.
4. Link to today with the hook line and preview the 3-layer cliff drawing task.

STUDENTS DO

1. Look at slides and listen.
2. Turn to a partner and answer why a sea shell is far from water.
3. Share one idea with the class.

Say: You get to draw a cliff that tells a true story about Earth. We will use shells and leaves trapped in rock to tell if land was once ocean. The layers of rocks are the pages in our history book [3], so bottom means older.

Ask: How could a seashell fossil end up high on dry land? (That land was once under the ocean.) · What do rock layers remind us of? (Pages in a history book.)

Check understanding: Thumbs up if you can say the surprise in your own words. If many are unsure, reread Slide 4 and have partners repeat it.

Support: Have partner point to the shell picture while you read the question aloud. **Stretch:** Ask what else besides shells could prove ocean, like fish teeth or ripple marks.

Use: Slides 1, 4-5

8–23 min **Teaching** 15 min · Whole class

Show how layers stack oldest at bottom and how fossils record water or land.

YOU DO

1. Display Slide 2 and read Lower layers are older, and fossils show past places. Explain most surface rocks are sedimentary, formed when broken bits carried by water settle to the bottom in rivers, lakes, and oceans [3].
2. Walk through Slide 3 timeline from Sea covers area, shelled animals live through Animals die and get buried in mud to Layers press into rock, land rises. Point out the largest, or heaviest, particles settle first and layers pile one on top of the other [3].
3. Use Slide 7 to compare Top Layer Made last, so younger with Bottom Layer Made first, so older. Stress in any undisturbed stack the bottom bed is older than any bed on top [3][7] and most sediments were laid down horizontally [3].
4. Show Slide 10 steps Animal dies and sinks to bottom, Quick burial in mud or sand, More layers pile on and press, Bone turns to rock fossil. Explain quick burial matters because sediment in water covers sea creatures quickly with mud and sand [4] and most fossils are found in sedimentary rock such as shale, limestone, and sandstone [12]. Then start Worksheet Task B in pairs to link each fossil-formation step to its science.

STUDENTS DO

1. Chant bottom-oldest, top-youngest while pointing down then up.
2. With a partner, complete Worksheet Task B by linking each fossil step to its science.
3. Hold up Task B to show matches.

Say: New layers pile on top of old, so bottom is oldest and top is youngest. Quick burial in mud or sand saves hard parts like shells and bones, then more layers press them into rock. Shells low mean water long ago, leaves or footprints high mean land later.

Worked example: Look at my two bands. Bottom band has shells. Top band has leaf prints. Step 1: bottom was made first, so older. Step 2: shells mean water. Step 3: leaves mean land. So this place changed from ocean to land, with ocean older.

Ask: Which layer is older if one sits above another? (The bottom one, because it was made first.) · Why are sea animals common as fossils? (Because water quickly buries them in mud and sand.) · What does a shell in the bottom rock tell about the past? (That place was under water long ago.)

Check understanding: Use mini whiteboards: draw two boxes and label oldest and youngest. Scan. Reteach with Slide 7 if more than a few flip them.

Support: Give word bank burial, press, mud, sand for Task B and read steps aloud. **Stretch:** Ask what tilting after forming would do, since rocks not horizontal were moved later [3].

Use: Slides 2-3, 7, 10, Worksheet Task B

23–48 min **Main activity** 25 min · Groups

Build a 3-layer cliff that uses fossil patterns to explain a change from ocean to land.

YOU DO

1. Show Slide 9 Your task Draw a 3-layer rock column and tell its Earth story. State Groups of 4, Draw 3 flat layers, bottom oldest, Add shell fossils low, plant fossils high.
2. Model on board with ruler three flat colored stripes for strata, since rock layers are also called strata [3] and layering is the most obvious feature of sedimentary rocks [3]. Add shells low and leaves high, showing sand becoming sandstone and mud becoming mudstone or shale [3].
3. Hand out white paper, colored pencils, rulers and support template, and set 20 minutes for drawing plus 5 minutes for captions.
4. Circulate, ask each group to read its stack bottom to top and name oldest and youngest.

STUDENTS DO

1. Draw three flat layers with ruler and color oldest at bottom.
2. Add shells low and plants or footprints high.
3. Write a two-sentence evidence story and tape up panel for sharing.

Say: Draw three flat bands with a ruler, oldest at the bottom. Put shell fossils low for ocean and plant fossils high for land. Write two sentences that use we know and because we see to explain the change.

Worked example: My bottom stripe: brown, labeled oldest, with 3 shells for ocean. Middle stripe: tan sandstone for mud piling up. Top stripe: gray, labeled youngest, with leaves and footprints for land. Caption: This place was once under the ocean. We know because shells are in the oldest bottom rock and leaves are in the youngest top rock.

Ask: Where do you put the oldest layer and why? (At the bottom, because new layers pile on top of old.) · What fossil shows ocean long ago? (Shells low in the bottom rock.) · What sentence proves your change? (We know land rose because we see shells below and land clues above.)

Check understanding: Stop at halfway: each group holds up column and points to oldest. Fix order now if flipped before coloring.

Support: Hand out a three-box template with the bottom box already labeled oldest to color inside. **Stretch:** Have fast groups add a crack or tilt to one side and explain what event happened last.

Use: Slide 9

48–60 min **Plenary** 12 min · Whole class

Share stories and check which clues prove the landscape changed over time.

YOU DO

1. Lead Slide 11 vote Best Clue? with choices Seashells in rock on land, Animal footprints in rock, Tilted or broken rock layers. Tally hands.
2. Run Slide 12 True or false? for New layers pile on top of old and Bottom layers are older than top layers. Have class answer together.
3. Hand out Worksheet Task D Odd one out for pairs to circle and write one line why.
4. Revisit success lines and collect panels.

STUDENTS DO

1. Vote, then defend choice in one sentence with a partner.
2. Answer true or false together with thumbs.
3. Complete Task D and share odd-one-out reason.

Say: Seashells in rock on land best show ocean became land. Tilted bands show layers moved after they formed, often by tilting during mountain building [3]. Good evidence always links what we see to what happened before.

Ask: Which clue best shows land changed over time and why? (Seashells in rock on land, because ocean animals lived where land is now.) · True or false: bottom layers are older than top layers? (True, new layers pile on top of old.)

Check understanding: Collect Task D lines. If half miss, pull a small group tomorrow to reorder strips bottom to top.

Support: Offer sentence starter I see __ on the bottom, so I think __ for vote defense. **Stretch:** Ask what could remove a middle layer, to start thinking about erosion.

Use: Slides 11-12, Worksheet Task D

Common mistakes

Mistake	How to spot it	How to fix it
Top layers are oldest because they are on top.	Labels youngest at bottom and oldest at top in drawing.	Retell pile rule: in any undisturbed stack the bottom bed is older than any bed on top [3][7]. Have them point down for older.
Any rock can hold fossils, even cooled lava rock.	Draws bones in speckled granite-like rock.	Remind most fossils are found in sedimentary rock such as shale, limestone, and sandstone [12], formed from pressed mud and sand [3].
Tilted layers formed tilted.	Says tilt happened first when explaining crack.	Remind most sediments were laid down horizontally [3], so tilt must happen after forming during mountain building [3].

Support

- Three-box template with bottom box labeled oldest to color inside.
- Word bank: older, younger, evidence, ocean, land and sentence starter I see __ on the bottom, so I think __.

Stretch

- Add a crack or tilt to one side and explain what event happened last.
- Add a fourth panel predicting what erosion might do next.

For the LSE or teaching assistant

Sit with focus group during Main; help hold ruler, label oldest at bottom, prompt we know __ because we see __.

Check for understanding

Question	Answer
Are top or bottom layers older in flat rock? Why?	Bottom, because new layers pile on top of old.
Hill rock has sea shells. What was it long ago?	Under the ocean.
Give one fossil clue for land.	Leaves or footprints high in the rock.

Homework

Look at a brick wall or curb and sketch its bands, circling the oldest band you see.

Sources

1. Science Grade 4 - Chicago Public Schools · cps.edu · https://www.cps.edu/sites/skyline/curriculum/science/grade-4/
2. Acellus® Grade 4 Science · science.edu · https://www.science.edu/Acellus/curriculum/science/lesson-lists/Grade%204%20Science.pdf
3. Fossils, Rocks, and Time: Rocks and Layers · pubs.usgs.gov · https://pubs.usgs.gov/gip/fossils/rocks-layers.html
4. Fossils – KS2 Science curriculum - BBC Bitesize · bbc.co.uk · https://www.bbc.co.uk/bitesize/articles/zt3ntrd
5. Evidence of evolution - rock fossils - Evolution - AQA - GCSE ... · bbc.co.uk · https://www.bbc.co.uk/bitesize/guides/zcqbdxs/revision/7
6. Rainbow rocks: Science primary resource | National Geographic ... · natgeokids.com · https://www.natgeokids.com/uk/primary-resource/rainbow-rocks-science-primary-resource/
7. How Are Fossils Used to Date Rock Layers? - sciencenewstoday.org · sciencenewstoday.org · https://www.sciencenewstoday.org/how-are-fossils-used-to-date-rock-layers
8. fossils: geological dating - Students - Britannica Kids · kids.britannica.com · https://kids.britannica.com/students/assembly/view/53239
9. Teaching About Fossils - Evidence in Layers of Sedimentary Rock · enjoy-teaching.com · https://enjoy-teaching.com/fossil-layers/
10. Unit Plan 28 (Grade 4 Science): Rock Layers & Fossils · teachmaverick.com · https://www.teachmaverick.com/up-4-science-rock-layers-fossils/
11. Earth Science for Kids: Rocks, Rock Cycle, and Formation · ducksters.com · https://www.ducksters.com/science/rocks.php
12. Earth Science for Kids: Fossils - Ducksters · ducksters.com · https://www.ducksters.com/science/earth_science/fossils.php
13. Types of rock – KS2 Science curriculum - BBC Bitesize · bbc.co.uk · https://www.bbc.co.uk/bitesize/articles/zgj9r2p
14. Fossils - Library For Kids · libraryforkids.com · https://libraryforkids.com/fossils/
15. Q2 W7 - LESSON Fossils - odysseyk12.org · odysseyk12.org · https://odysseyk12.org/hs/teachers/panico/q2/q2w7/

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