Why Are There Fish In The Desert?

Welcome to NSTA's Daily Do

Teachers and families across the country are facing a new reality of providing opportunities for students to ***do*** science through distance and home learning. The **Daily Do** is one of the ways NSTA is supporting teachers and families with this endeavor. Each weekday, NSTA will share a sensemaking task teachers and families can use to engage their students in authentic, relevant science learning. We encourage families to make time for family science learning (science is a social process!) and are dedicated to helping students and their families find balance between learning science and the day-to-day responsibilities they have to stay healthy and safe.

What is Sensemaking?

Sensemaking is actively trying to figure out how the world works (science) or how to design solutions to problems (engineering). Students ***do*** science and engineering through the science and engineering practices. Engaging in these practices necessitates students be part of a learning community to be able to share ideas, evaluate competing ideas, give and receive critique, and reach consensus. Whether this community of learners is made up of classmates or family members, students and adults build and refine science and engineering knowledge together.

Introduction

The image at right is the fossil of a catfish that lived over 40 million years ago. Maybe even more incredible than finding a 40 million-year-old fossil catfish is finding that catfish in the middle of a desert!

In today's task, *Why are there fish in the desert?,* students and their families read the NSTA eBook *Thinking Like a Scientist: Fish Out of Water* which engages them in science and engineering practices and the use of patterns as a thinking tool (crosscutting concept) to figure out science ideas about Earth's changing landscape over time.

Preparation

Before you invite your students to read aloud or read along with you, take a few minutes to become familiar with the eBook and suggested supporting resource(s).

STEP 1

Watch the video (above) for guidance on how to best use the *Think Like a Scientist: Fish Out of Water* eBook with your students.

STEP 2

Open the *Think Like a Scientist: Fish Out of Water* eBook. You may want to pause here and read the eBook to identify pages with (a) big ideas you want to emphasize through questioning and/or discussion and (b) embedded tasks that will require students to develop new knowledge and skills to complete.

STEP 3

Open the Fish Out of Water Student Notebook. You may choose to print this notebook, but it is not necessary. Students and families can follow the directions in the student notebook and record their responses on blank or scrap paper.

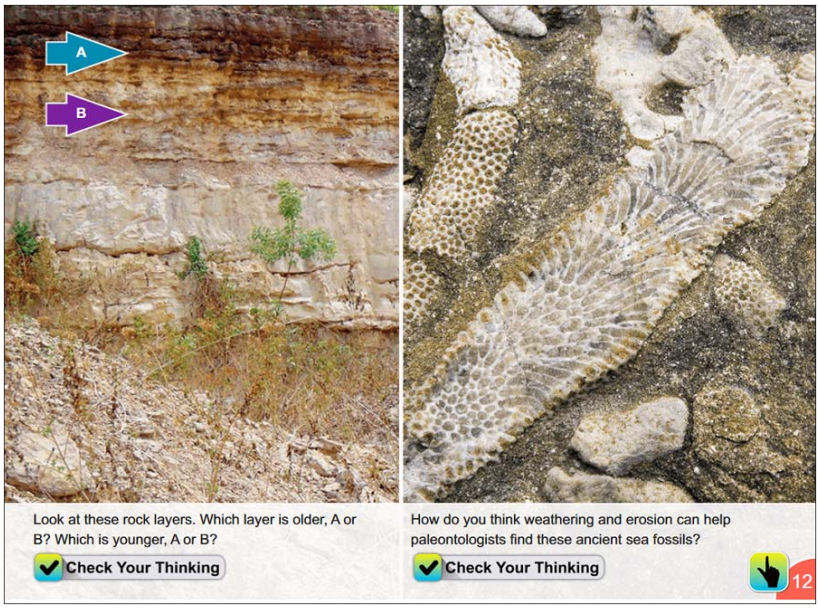
Now you're ready to begin today's task!

Note: *Fish Out of Water's* many interactive features allow students and families to explore ancient environments with Kat. Below are additional opportunities the eBook provides for students and their families to engage in the science and engineering practices to make sense of science ideas.

Engaging Students with the eBook

Page 9**.** Ask students, "The Wadi Al-Hitan isa desert. What do you think is covering the ground in this picture? (sand) What are some other places - *environments* - you would expect to find a lot of sand around? (oceans, lakes, sand dunes, rivers)

Turn back to page 6. Ask students, "Based on what we've observed so far, can you explain how this catfish ended up in a desert?" Allow students independent thinking time to create an initial explanation for how the catfish ended up in the desert.



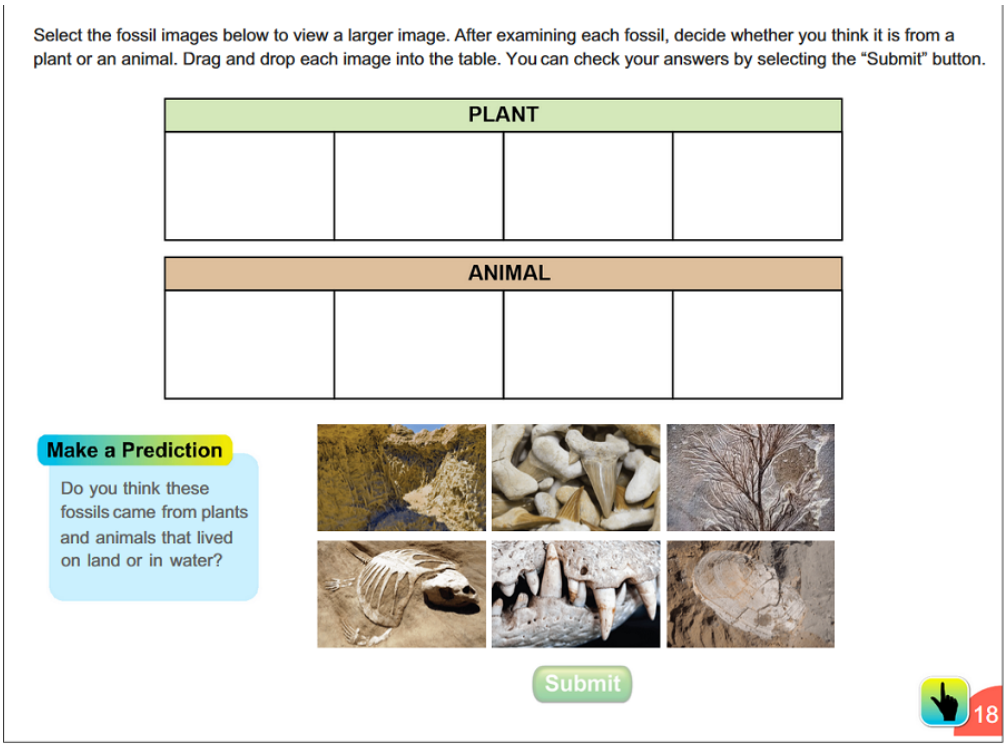
Page 12. Ask students, "The layers of rock in this picture are made of sand, slightly smaller pieces of rock called silt, and even smaller pieces of rock called mud. Which layer of rock, A or B is the youngest? In other words, which layer of rock formed last?"

Ask students to turn and talk with a partner (classmate or family member) to share their ideas.

Next, click the "Check Your Thinking" box and read about the rock layers.

Ask students, "So the layer of rock on top is youngest, or the last layer formed. Can you think of other "piles" around your home, school or community that is like this pile of rock layers? How are they like?" (piles of laundry, piles of newspapers for recycling, layers of food waste in a compost bin, layered foods like cakes or cookie bars, piles of toys in toy box or bin) Ask students to share their examples with the class.

Page 18. Make sure to stop here without turning the page (some answers are revealed on the next page).



Tell students the fossils on the page are all found in the same layer of rock as the catfish fossil. Ask, "Compared to the catfish fossil, are these fossils older, younger or the same age as the catfish fossil?" (same age, some students may say it depends where in the rock layer they are found - below catfish makes the older and above catfish makes them younger)

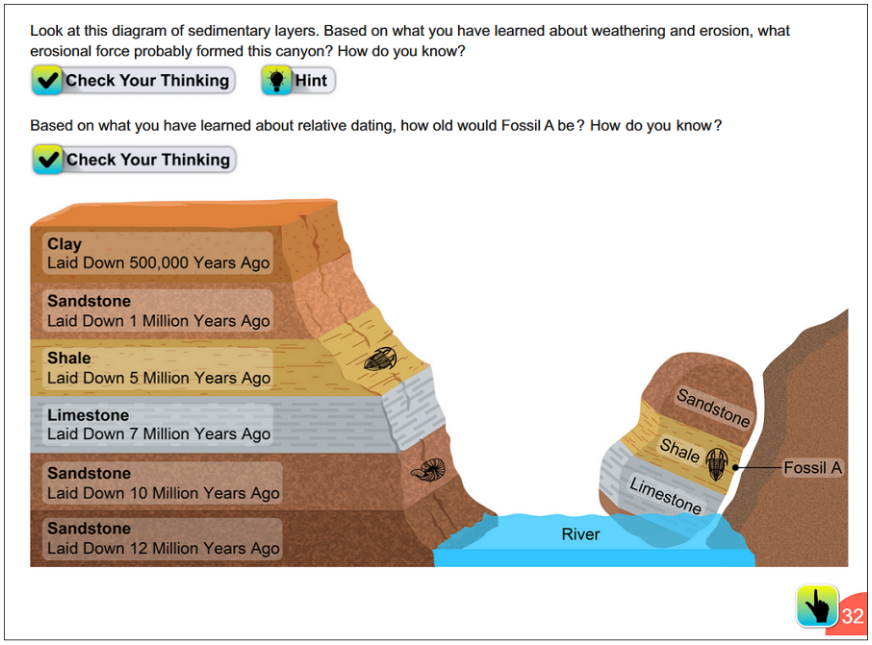
Ask students to click on one of the pictures which will enlarge the picture. Ask students, "Can you think of a living plant or animal that is similar to this fossil? Where would you expect to find this living plant or animal, that is, what is the plant's or animals' *environment?*"

Repeat this activity for each picture. Students may have a difficult time identifying the plant fossils but his is OK. (Students who have experience with salt water fish tanks or swimming in the ocean may be able to recognize the individual plant fossil as "coming from the ocean.")

Return to the question, "Based on what we've observed so far, can you explain how this catfish ended up in a desert?" This time you might choose to share this explanation organizer with your students. Encourage them to think about evidence from the observations they've made (data) while reading *Fish Out of Water* eBook that would help them answer the question.

If students don't have a lot of experience finding relevant evidence from data, you might choose to have students turn and talk prior to adding evidence to the scaffold. Next, you might consider asking students to share their evidence with the class and develop a class list of evidence students can use to make a claim. Once the list is created, give students independent thinking to make a claim.

Page 32. Ask students, "Have you ever noticed water moving bits of rock like sand (biggest pieces) or mud (smallest pieces)? Where did you see water moving bits of rock?" Ask students to turn and talk with a partner (classmate or family member). Students might have one or more of the following experiences:



- waves moving sand at the beach (knocking down sand castles, filling holes)
- water moving sand out of the sandbox
- feeling sand float by while standing in moving water (ocean, lake, stream, surface water flowing down street after a rainstorm)
- muddy water flowing over the ground
- mud or sand left behind when a puddle dries (evidence water moved mud/sand there

Say to students, "So based on our experiences, water can move sand and mud from one place to another (share specific experiences you overheard students share) and also drop the sand and mud it is carrying in different locations (share specific experiences you overheard students share)."

Ask students, "Can you create a model to explain how water dropping off sand and mud helped create a fossil catfish and how water moving sand and mud helped the paleontologist, Sanaa El-Sayed, find the catfish fossil?" Give students independent thinking time to create a model.

If students have difficulty starting their model, ask them what has to be in the model to explain how moving water can help create and help someone find a fossil. (water, sand, catfish, catfish fossil). Once students have identified the parts (*components)* of the model, ask students how the parts interact with each other. For example, students have drawn sand and water - ask, "How are the sand and water interacting in this part of you model? (water is dropping off sand) How could you show on your model that water is dropping sand? (use and arrow to show the sand is going down, write 'dropping off' next to the sand, etc.)

Assign students to small groups of three or four students. Have one students share their model with the group. Give each other group member an opportunity to compare their model to the sharer's. Students can use the sentence starter, "One thing that is similar/different between your

model and my model is...." Give students time to revise their models after everyone in the group has had at least one turn to share a similarity and difference.

You might choose to create a class consensus model before moving on. Ask each group to share one similarity between most of their models until all the groups have shared. Then ask if there are any other similarities the groups noticed between their models. Ask the class if they are in agreement with each part or interaction you add to the model. If they are not in agreement, ask them if it is OK to put a question mark on that part of the model. (You might also ask, "How might we investigate the answer this question?")

Return to the explanation organizer. Ask students, "Based on evidence from observations in the story and evidence from our consensus model, make a claim about how this catfish ended up in a desert." You may choose to first give students independent thinking time to add evidence to the scaffold and then ask them to turn and share their evidence with a partner before asking them to make a claim. You may also wish to complete the explanation collaboratively.

NSTA Collection of Resources for Today's Daily Do

NSTA has created a *Why are there fish in the desert?* collection of resources to support teachers and families using this task. If you're an NSTA member, you can add this collection to your library by clicking ADD TO MY LIBRARY located near the top of the page (at right in the blue box).

Check Out Previous Daily Dos from NSTA

The NSTA Daily Do is an open educational resource (OER) and can be used by educators and families providing students distance and home science learning. Access the entire collection of NSTA Daily Dos.