Jenna Smith
BYU–Idaho Student Teacher
West Kearns Elementary
Dual Immersion (Spanish)
4th Grade Science: Fossils
Fall 2022

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Unit Overview

Note: This unit was taught in a Spanish Dual Immersion classroom. While the lesson plans are written in English, and the pre- and post- assessments are administered in English as a common formative assessment between all the 4th grade classes, the actual lessons were taught in Spanish. For that reason, you will notice that the resources and materials are in Spanish.

Big Idea: Fossils and rock layers teach us about the past. The purpose of this unit is for students to understand how the earth's landscapes and organisms have changed over time and how fossils and rock layers provide evidence of this.

Essential Question:

How can fossils provide evidence of change over time in environments and organisms on the earth?

Standards:

Standard 4.1.3 Analyze and interpret data from fossils to provide evidence of the stability and change in organisms and environments from long ago. Emphasize using the structures of fossils to make inferences about ancient organisms. Examples of fossils and environments could include comparing a trilobite with a horseshoe crab in an ocean environment or using a fossil footprint to determine the size of a dinosaur. (LS4.A)

Standard 4.1.4 Engage in argument from evidence based on patterns in rock layers and fossils found in those layers to support an explanation that environments have changed over time. Emphasize the relationship between fossils and past environments. Examples could include tropical plant fossils found in Arctic areas and rock layers with marine shell fossils found above rock layers with land plant fossils. (ESS1.C)

4.W.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly.
4.W.4: Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.
4.MP.2: Reason abstractly and quantitatively.
4.MP.4: Model with mathematics.

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Objectives:

Students will know:	**Students will do:**
Fossils provide evidence of stability and change in organisms and environments from long ago.	Analyze and interpret data from fossils.
The patterns of rock layers.	Make inferences about ancient organisms based on their structures.
The relationship between fossils and past environments.	Engage in an argument from evidence based on patterns in rock layers and fossils found in those layers to support an explanation that environments have changed over time.

Unit Calendar: October 5th-October 27th

Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
	Letter to Parents	**Pre-Assessment and Key**	**Lesson 1 (Anchor Phenomenon)** **Standard 4.1.3** **Objective:** Students will be able to generate questions and think critically about why land animal fossils might be found in a watery cave. **Assessment:** Watery Cave Worksheet ((Now and Later in their	**Lesson 2:** **Standard 4.1.3** **Objective:** Students will be able describe how fossils provide evidence that habitats have changed over time. **Assessment:** Fossil Dig Worksheet **Bloom's Taxonomy Level:** Understand

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			Notebooks) **Bloom's Taxonomy Level:** Analyze **Materials:** Underwater Cave (Mystery Science) **Activities:** Begin See/Think/Wonder Anchor Chart for the entire unit. Watery Cave investigation. **Technology:** Mystery Science (SAMR Level 3)	**Materials:** Mystery Science Lesson 1: Where Can You Find Whales Whales Slides in Spanish **Activities:** Whales in the Desert investigation Fossil Dig **Technology:** Mystery Science (SAMR Level 3)
Lesson 2: **Standard 4.1.3** **Objective:** Students will be able describe how fossils provide evidence that habitats have changed over time. **Assessment:** Google Form Quiz	**Lesson 3:** **Standard 4.1.3** **Standard 4.1.4** **Objective:** Students will be able to analyze fossils within different depths of the earth and recognize a pattern within each depth. Students will be able to use the	**Lesson 4:** **Standard 4.1.3** **Standard 4.1.4** **4.MP.2** **4.MP.4** **Objective:** Students will be able to produce a timeline demonstrating the various depths of the earth and the fossils found	**Fall Break**	**Fall Break**

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Bloom's Taxonomy Level: Understand **Materials:** Mystery Science Lesson 1: Where Can You Find Whales in the Desert? Spanish **Activities:** Mystery Science Whale Reading **Technology:** Mystery Science (SAMR Level 3)	knowledge acquired that different fossils were found at different depths as evidence of a change in environment. **Assessment:** STEM Scope Reflection Questions **Bloom's Taxonomy Level:** Analyze **Materials:** STEM Scope with cards: Fossil Dig **Activities:** Fossil Dig and Reflection	within these layers based on the STEM Scope activity. **Assessment:** Timeline **Bloom's Taxonomy Level:** Create **Materials:** STEM Scope with timeline (PDF) **Activities:** Fossil Layers Investigation/ Timeline (STEM Scope)		
Teacher Prep Day	**Lesson 5:** **Standard 4.1.4** **Objective:** Students will be able to explain that the oldest rock layer can be found at the bottom. **Assessment:**	**Lesson 6:** **Standard 4.1.3** **Objective:** Students will be able to make assumptions about the organisms and its environment based on the fossil characteristics.	**Lesson 7:** **Standard 4.1.3** **Objective:** Students will be able to analyze and determine why some fossil evidence indicates changes in the environment.	**Lesson 7: Standard 4.1.3 4.W.2** **Objective:** Students will be able to argue the change in environment over time in a watery cave. **Assessment:** Writing

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	Exit Ticket in Google Forms **Bloom's Taxonomy Level:** Understand **Materials:** Generation Genius Reading: The Earth's Landscapes PBS Grand Canyon Video **Activities:** Generation Genius Reading with Comic Strip Drawings.	**Assessment:** Dinosaur Teeth Worksheet:Students are required to observe a picture of a fossil and make assumptions about the animal and characteristics. **Bloom's Taxonomy Level:** Analyze **Materials:** Mystery Science Lesson 2: Dinosaur Teeth **Activities:** Mystery Science Fossil Activity Anchor Phenomenon Connection	**Assessment:** Watery Cave Tour Writing (Tomorrow) **Bloom's Taxonomy Level:** Evaluate **Materials:** Mystery Science Lesson 3: Can You Outrun a Dinosaur (just the lesson part) Lesson 4: Anchor Connection **Activities:** Mystery Science video Anchor Phenomenon Chart Questions	**Bloom's Taxonomy Level:** Evaluate **Materials:** Performance Task: Informational Writing (body paragraphs only) **Activities:** Informational Writing Text
Lesson 9 Standard 4.1.4 **Objective:** Students will be able to explain the process by which fossils are made. **Assessment:** Flipgrid	**Lesson 10: Standard 4.1.4** **Objective:** Students will be able to explain the process by which fossils are made. **Assessment:** Fossilization	**Lesson 11: Standard 4.1.4** **Objective:** Students will be able to justify why we do not see more fossils. **Assessment:**	**Post-Assessment and Key**	

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response to questions **Bloom's Taxonomy Level:** Understand **Materials:** Mystery Science 4 **Activities:** What did Utah look like slides Complete timeline Flipgrid Response to questions	Cards Kahoot Game **Bloom's Taxonomy Level:** Explain **Materials:** TED Talk: How to Fossilize Yourself Fossilization Slides **Activities:** Fossilization Cards	Google Forms Exit Ticket **Bloom's Taxonomy Level:** Evaluate **Materials:** Nearpod: Mammoth **Activities:**		

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Unit Resources

Pre-Unit Preparation	Letter to Parents Pre-Assessment and Key
Anchor Phenomenon	Underwater Cave (Mystery Science) Underwater Cave Spanish Translation Slides Watery Cave Graphic Organizer
Whales in Egypt	Mystery Science Lesson 1: Where Can You Find Whales Whales Slides in Spanish Fossil Dig Worksheet Fossils Dig Questions
Whales in Chile	Mystery Science Whale Reading Encontraron una ballena Slides
Fossil Dig	STEM Scope Cards STEM Scope Table STEM Scope Fossils Key Fossil Slides
Earth's Landscapes	Generation Genius Reading: The Earth's Landscapes Slides PBS Grand Canyon Video
Dinosaur Teeth	Mystery Science Lesson 2: Dinosaur Teeth Anchor Phenomenon Connection Dinosaur Teeth Worksheet
Can You Outrun a Dinosaur	Mystery Science Lesson 3: Can You Outrun a Dinosaur (just the lesson part) Anchor Connection Footprints in Sand Video
Cave Tour Guide	Performance Task
How Has Utah Changed?	Mystery Science 4 What did Utah look like slides Utah Map/Fossils Cutouts Utah Government Geology Site
The Fossilization Process	TED Talk: How to Fossilize Yourself

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	Fossilization Cards Fossilization Slides Kahoot Game
Mystery Fossil	Nearpod: Mammoth Review Questions
Post-Unit Wrap-Up	Post-Assessment and Key

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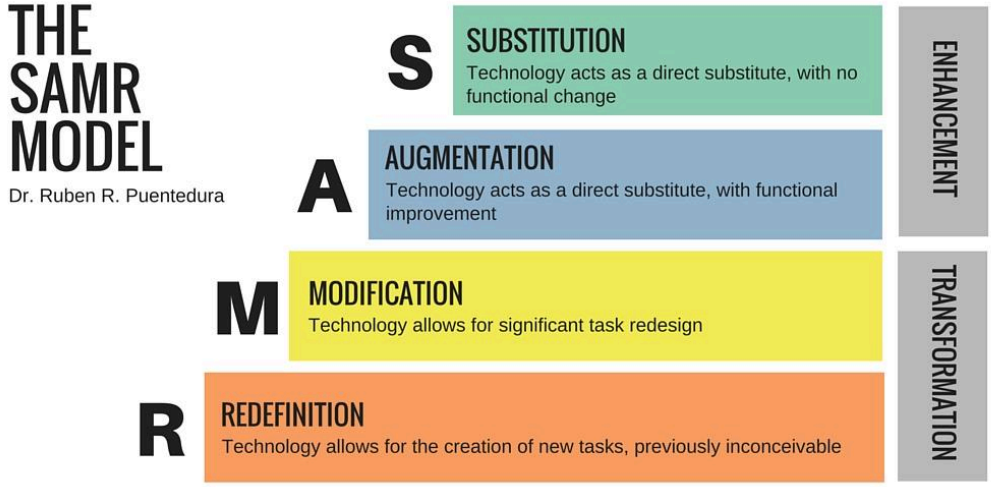
Unit Technology Integration



Mystery Science (Augmentation):

In lessons 1,2,6,7, and 9, I used the Mystery Science technology. Mystery Science is a website with inquiry based lessons. The lessons involve videos, discussion questions, as well as activities. Mystery Science videos augment the learning because they allow students to view scenarios around the world that they might not have exposure to in their quotidian surroundings. For example, one of the Mystery Science videos that we saw together showed the students a quandary where many fossils were found. While students might be able to see these pictures in a textbook, these videos allow students to see more and hear the speaker at the same time.

Flipgrid (Modification):

In lesson 9, I used Flipgrid as a way to assess student understanding of the concepts taught that day. Flipgrid is a technology where students can enter in as a group, or a class, and respond to a topic through video. As students post their videos, other students are also able to view their videos and even show their approval of the video with the click of a heart button. This adds a whole new dimension to assessment because students are often more hesitant to write responses to questions. However, they love to talk. Thus, this can be a really great way for me to assess how much they understood a subject without taking the time to ask each one of them individually.

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Nearpod (Redefinition):

In lesson 11, I used Nearpod in order for students to investigate a mystery fossil. Nearpod allows students to view regular slides and videos. However, it also allows students to respond to questions posed within the program. Each student can access the Nearpod when the teacher opens a live session. This opportunity allows the teacher to collect concrete formative data while teaching. This possibility of having students respond to various questioning formats also increases engagement as students know they will each need to respond to the questions.

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Unit Literacy and Content Integration

Literacy Explain events, procedures, ideas, or concepts in a historical, scientific, or technical text, including what happened and why, based on specific information in the text.	● Mystery Science Whale Reading ● Generation Genius Reading: The Earth's Landscapes
Writing **4.W.2:** Write informative/explanatory texts to examine a topic and convey ideas and information clearly. **4.W.4:** Produce clear and coherent writing in which the development and organization are appropriate to task, purpose, and audience.	● Performance Task
Math **4.MP.2:** Reason abstractly and quantitatively. **4.MP.4:** Model with mathematics.	● STEM Scope Cards STEM Scope Table STEM Scope Fossils Key Fossil Slides

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Letter to Parents (English and Spanish)

Hello Parents,

As many of you know, I have had the privilege of being in your child's classroom for the past month. I have absolutely loved getting to know each one of them. I wanted to inform you that for the next three weeks, your child will be learning about how the earth has changed over time through the investigation of fossils and rock layers as part of the science curriculum. While we will do a lot of fun learning activities in class, we teachers know that the best learning happens through everyday experiences in the students' environment. I would like to provide you with a few resources of how you can support the learning of your child throughout this next science unit.

Here is a calendar of what we will be learning so you can follow along with your child's learning.

October 5-7: Why was a whale fossil found in the desert?

October 10-12: What are the fossil patterns in different rock layers?

October 20-23: What assumptions can you make about a creature based on its fossil?

October 26-29: How are fossils made?

Some fantastic questions you can ask your child to get some conversations going are:

- What do you think our neighborhood may have looked like a thousand years ago? Why do you think that?
- How do you think the earth will look in a thousand years from now?
- Where have you seen examples of different rock layers? What did they look like?
- What do you think causes the earth's environment to change?

Lastly, here are a few resources you can use should your child have more questions and would like to dive deeper into the topic.

- The American Museum of Natural History Paleontology for Kids Website (https://www.amnh.org/explore/ology/paleontology)
- The National Park Service Fossils Day Website (https://www.nps.gov/subjects/fossilday/kidsyouth.htm)
- National Geographic for Kids

(https://www.natgeokids.com/uk/tag/fossils/)

I appreciate all that you do to support Mrs. Ceballos' classroom and I look forward to exploring this new unit along with you and your child!

All the best,

Miss Jenna Smith

Student Teacher

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Hola padres,

Como muchos saben, he tenido el privilegio de estar en el aula de su niño este último mes. Me ha encantado conocer a cada uno de sus niños. Les quería informar que en las próximas tres semanas, su niño va a aprender sobre cómo la tierra ha cambiado a través del tiempo por medio de la investigación de los fósiles y capas de roca como parte del currículum de ciencias. Nos vamos a divertir mucho. No obstante, se que el mejor aprendizaje pasa en las experiencias diarias en el entorno del estudiante. Les quería dar unos recursos para que puedan apoyar al aprendizaje de su niño a lo largo de esta unidad.

Aqui esta el calendario del unidad:

October 5-7: ¿Por qué han descubierto fósiles de ballenas en el desierto?

October 10-12: ¿Cuáles son los patrones de los fósiles en diferentes capas de roca?

October 20-23: ¿Qué tipo de suposiciones podemos hacer sobre las criaturas basadas en los fósiles?

October 26-29: ¿Cómo son hechos los fósiles?

Algunos preguntas que podrían hacer a sus niños son:

- ¿Cómo piensas que nuestro vecindario se veía hace mil años? ¿Por qué piensas así?
- ¿Cómo piensas que se verá la tierra en mil años de hoy?
- ¿Jamás has visto un ejemplo de las capas en las rocas? ¿Cómo se veían?
- ¿Qué piensas que causa el cambio en el ambiente de la tierra?

Finalmente, si su nino quiere aprender más sobre los fósiles en casa, algunos sitio webs que pueden utilizar son:

- The American Museum of Natural History Paleontology for Kids Website (https://www.amnh.org/explore/ology/paleontology)
- The National Park Service Fossils Day Website (https://www.nps.gov/subjects/fossilday/kidsyouth.htm)
- National Geographic for Kids (https://www.natgeokids.com/uk/tag/fossils/)

Los aprecio mucho y estoy muy animada para explorar esta unidad con ustedes y sus niños.

Sinceramente,

Senorita Jenna Smith

Maestra Estudiantil

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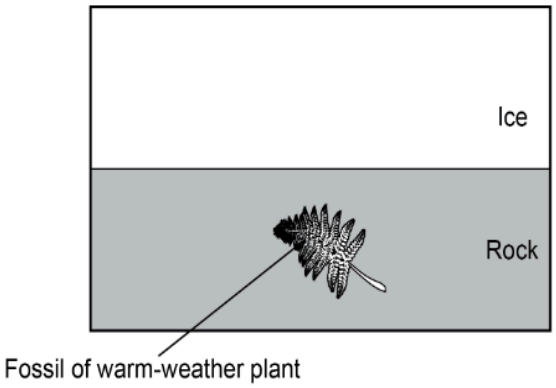
Fossils Unit Pre-Assessment

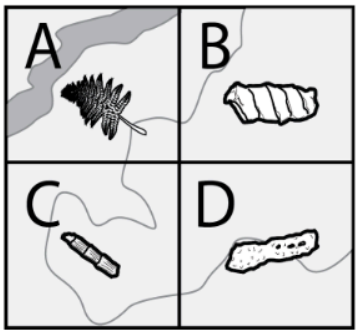
Below the ice in the arctic are rocks with fossils.
Some fossils found there are of plants that only grow in warm places.



Finding this fossil here can tell us what?

A. The land was not always a very cold area.
B. Some plants can grow in rock.
C. Rock is always covered with ice.
D. The arctic is not a very cold place.

2 The map shows where fossil plants were found. The table shows the habitat where these plants grew in the past.



Fossil	Identification	Habitat
	Fern	Swamps, marshland
	Seaweed	Salt water
	Marsh grass	Beside fresh water
	Cactus	Deserts

In which area on the map was there previously an ocean?

A. A
B. B
C. C
D. D

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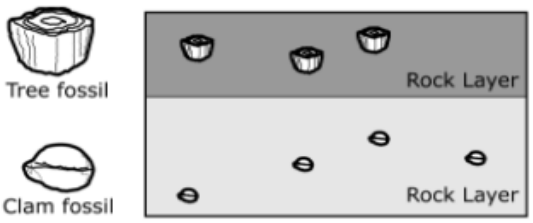
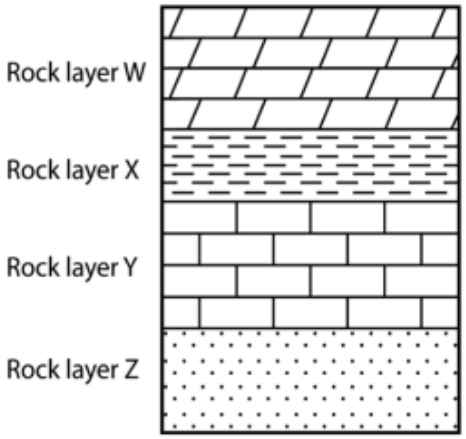
The fossils of clams, which live at the seashore, were found in a rock layer directly below a rock layer that contained tree fossils.



This evidence can be used to support the idea that–

A. Fossils form more quickly at the seashore than other places.
B. Clams and trees are always found in the same area.
C. The area where the fossils were found changed over time.
D. The layer containing the trees is older than the clam layer.

Several layers of rock are illustrated in their unchanged positions.



Which of the following conclusions is supported by the data in this illustration?

A. Rock layer W is the oldest of all the rock layers shown.
B. Rock layer X was formed just before rock layer Y.
C. Rock layer Y is twice as old as rock layer W.
D. Rock layer Z is the oldest of all the rock layers.

Why did you choose the answer you chose for question 4?_____

_____

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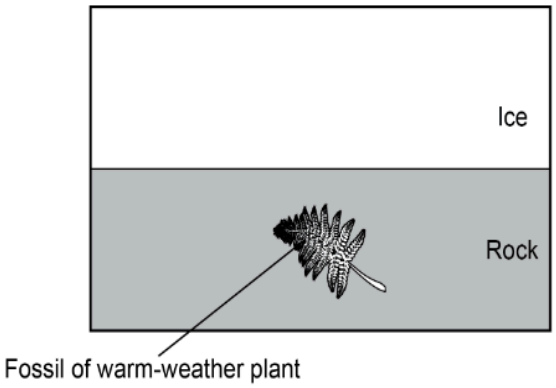
Fossils Unit Pre-Assessment Key

Below the ice in the arctic are rocks with fossils.
Some fossils found there are of plants that only grow in warm places.



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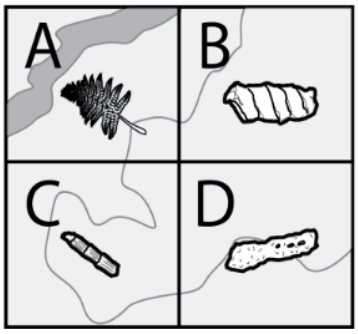

Fossil	Identification	Habitat
	Fern	Swamps, marshland
	Seaweed	Salt water
	Marsh grass	Beside fresh water
	Cactus	Deserts

In which area on the map was there previously an ocean?

A. A
B. B
C. C
D. D

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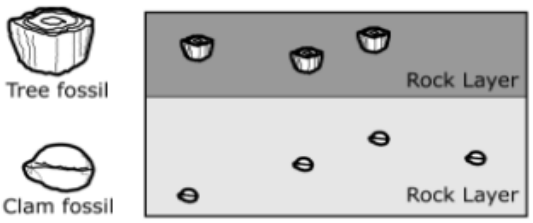
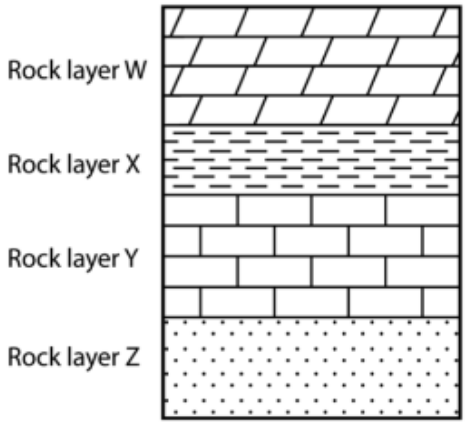
The fossils of clams, which live at the seashore, were found in a rock layer directly below a rock layer that contained tree fossils.



This evidence can be used to support the idea that—

A. Fossils form more quickly at the seashore than other places.
B. Clams and trees are always found in the same area.
C. The area where the fossils were found changed over time.
D. The layer containing the trees is older than the clam layer.

Several layers of rock are illustrated in their unchanged positions.



Which of the following conclusions is supported by the data in this illustration?

A. Rock layer W is the oldest of all the rock layers shown.
B. Rock layer X was formed just before rock layer Y.
C. Rock layer Y is twice as old as rock layer W.
D. Rock layer Z is the oldest of all the rock layers.

Why did you choose the answer you chose for question 4?_____

_____

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0 Name: Kensi

Fossils Unit Pre-Assessment

Below the ice in the arctic are rocks with fossils.
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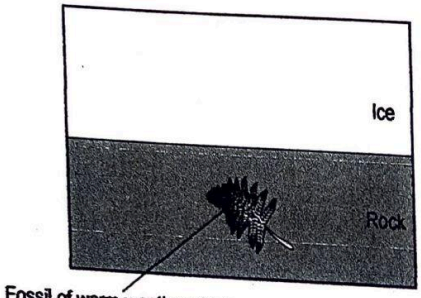
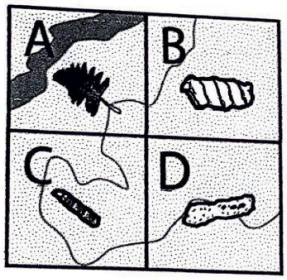


Finding this fossil here can tell us what?

A. The land was not always a very cold area. X
B. Some plants can grow in rock.
C. Rock is always covered with ice.
D. The arctic is not a very cold place.

2 The map shows where fossil plants were found. The table shows the habitat where these plants grew in the past.



Fossil	Identification	Habitat
	Fern	Swamps, marshland
	Seaweed	Salt water
	Marsh grass	Beside fresh water
	Cactus	Deserts

In which area on the map was there previously an ocean?

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B. B X
C. C
D. D

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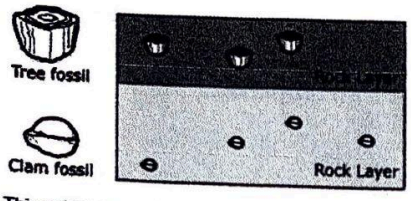
Kensi

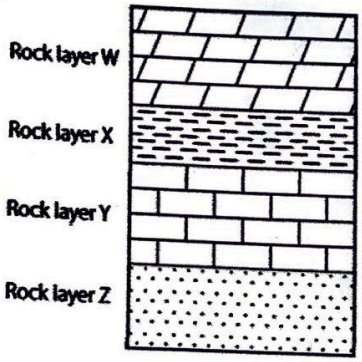
The fossils of clams, which live at the seashore, were found in a rock layer directly below a rock layer that contained tree fossils.



This evidence can be used to support the idea that–

(A) Fossils form more quickly at the seashore than other places.
B. Clams and trees are always found in the same area.
C. The area where the fossils were found changed over time. X
D. The layer containing the trees is older than the clam layer.

Several layers of rock are illustrated in their unchanged positions.



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Why did you choose the answer you chose for question 4? Because it was cried so it is old

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2 Name: Mi dael

Fossils Unit Pre-Assessment

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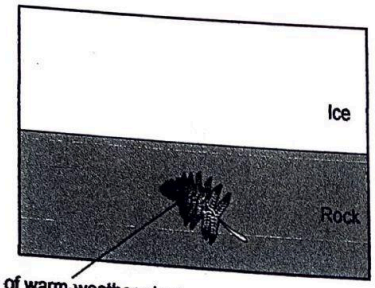

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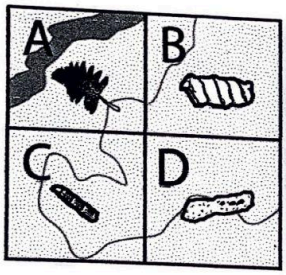

Fossil	Identification	Habitat
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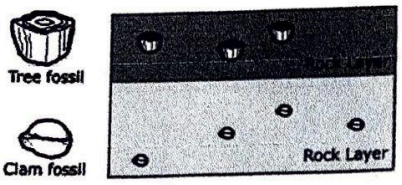

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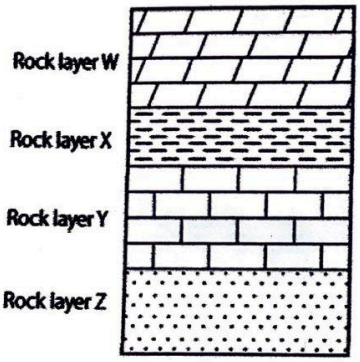

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Why did you choose the answer you chose for question 4? I think that cuz see it is a dif. patten

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4 +1 Name: Advik

Fossils Unit Pre-Assessment

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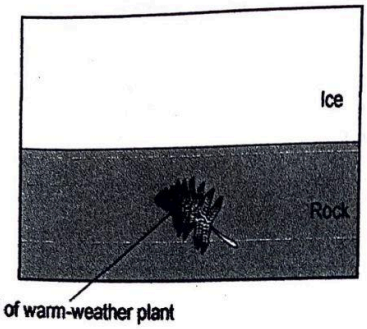
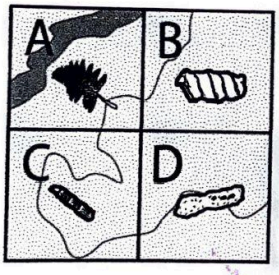


Finding this fossil here can tell us what?

A. The land was not always a very cold area.
B. Some plants can grow in rock.
C. Rock is always covered with ice.
D. The arctic is not a very cold place.

2 The map shows where fossil plants were found. The table shows the habitat where these plants grew in the past.



Fossil	Identification	Habitat
	Fern	Swamps, marshland
	Seaweed	Salt water
	Marsh grass	Beside fresh water
	Cactus	Deserts

In which area on the map was there previously an ocean?

A. A
B. B
C. C
D. D

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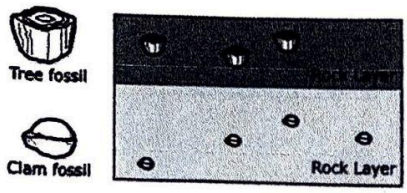
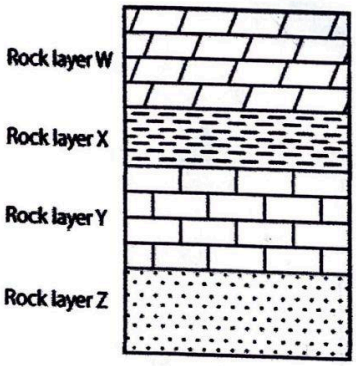
The fossils of clams, which live at the seashore, were found in a rock layer directly below a rock layer that contained tree fossils.



This evidence can be used to support the idea that–

A. Fossils form more quickly at the seashore than other places.
B. Clams and trees are always found in the same area.
C. The area where the fossils were found changed over time.
D. The layer containing the trees is older than the clam layer.

Several layers of rock are illustrated in their unchanged positions.



Which of the following conclusions is supported by the data in this illustration?

A. Rock layer W is the oldest of all the rock layers shown.
B. Rock layer X was formed just before rock layer Y.
C. Rock layer Y is twice as old as rock layer W.
D. Rock layer Z is the oldest of all the rock layers.

Why did you choose the answer you chose for question 4? It is at the bottom of the diagram

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Lesson 1: Underwater Cave (Anchor Phenomenon)

Date: October 5, 2022

Standard:

4.1.3 Analyze and interpret data from fossils to provide evidence of the stability and change in organisms and environments from long ago. Emphasize using the structures of fossils to make inferences about ancient organisms. Examples of fossils and environments could include comparing a trilobite with a horseshoe crab in an ocean environment or using a fossil footprint to determine the size of a dinosaur. (LS4.A)

Objective: Students will be able to generate questions and predictions regarding the odd findings in the watery cave.

Student Friendly Objective: I can be curious about what I see today. I can develop questions and predictions based on what I see.

Yo puedo ser curioso sobre lo que veo hoy. Puedo hacer preguntas y predicciones basadas en lo que observo.

Differentiation:

Make sure each student is getting a chance to share their ideas in partner talks. Address listening to one another at the beginning. Check in with the following students: Iker, Eric, Michael, Fabien, Tony, and AJ (Are their partners giving them the chance to talk? If not– correct this). Set 1 minute timers– by the end, both partners need to have shared their ideas.

Resources:

- Mystery Science Investigation
- See/Think/Wonder Chart
- Markers
- Watery Cave Worksheet (44 copies for Now and Later)
- Science Notebooks
- Glue
- Scissors
- Watery Cave Anchor Connections

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Assessments:

a) **Formative:**
   Answers as a group
   Partner discussions
   See/Think/Wonder Chart (Class Post-It Note)

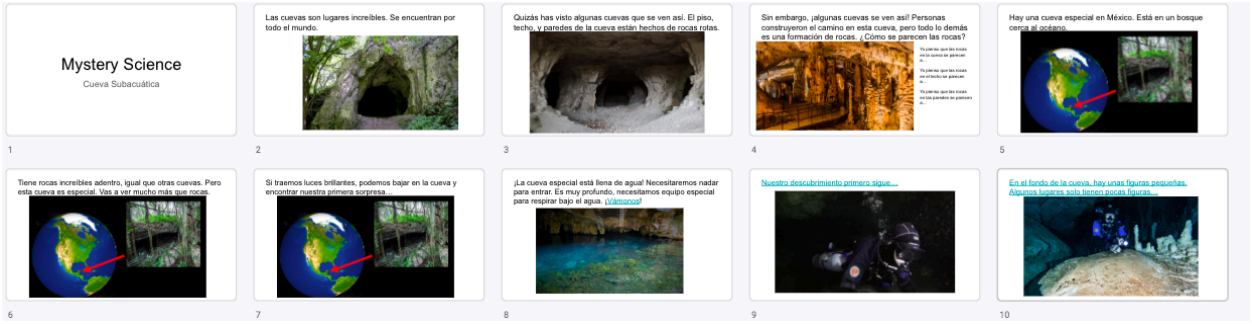
b) **Summative:**
   Watery Cave Worksheets (Before)

Procedures:

a) **Activating prior knowledge:**
   Who has gone to a cave before? What kinds of things can you expect to see in a cave? Have students cut out and glue Worksheets into their notebooks with the words “Antes” and “Despues” at the top. Demonstrate on the doc cam.

b) **Guided Practice:**

Read the following slides chorally together. Answer the questions of what do you see, what do you think, and what do you wonder as a class. Do think pair shares. Add responses to the see/think/wonder chart.



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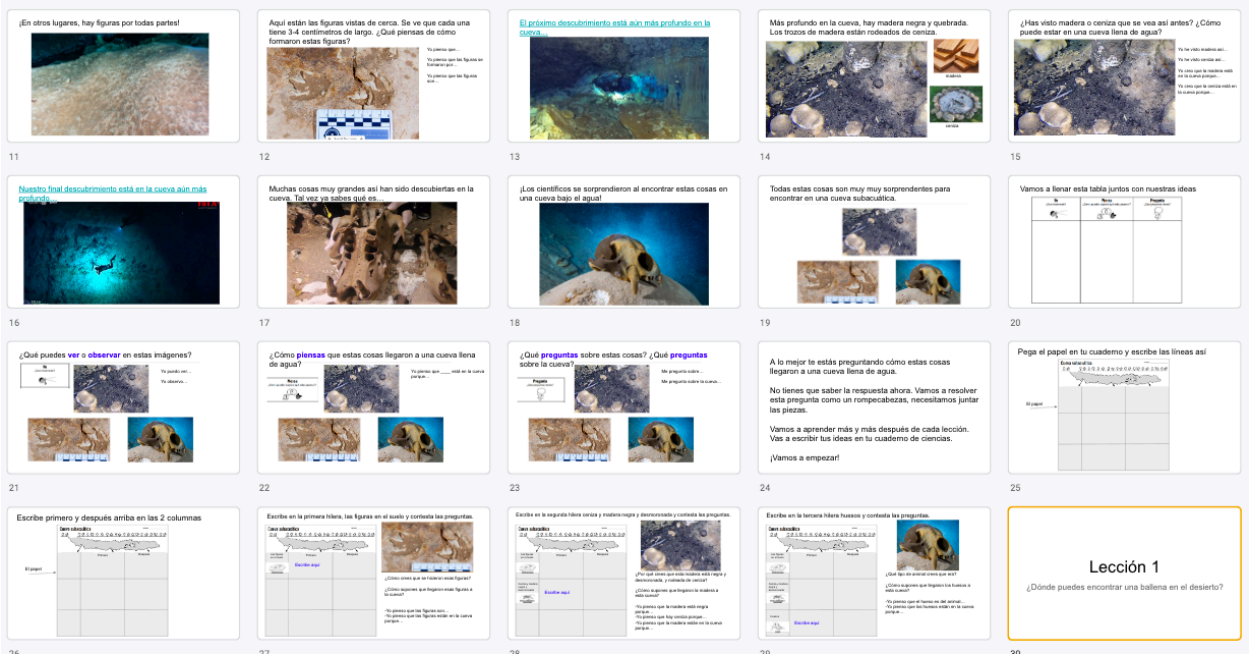

Footprints: What do you think those shapes are?
What do you wonder about them?
Have students fill out the first portion of the Watery Cave Worksheet (Before)
Ash: What do you see/think/wonder?
Have students discuss and fill out the next portion of the worksheet.
Bones: What do you see/think/wonder?

Have students fill out and discuss the “before” portion of the worksheet as indicated by the slides.

Closure:

We are going to keep investigating mysterious scenarios like we did today. I want you to approach it with curiosity and with an open mind. Tell your partner– what is one thing you are curious about after today’s investigation?

Reflection:

One thing that I really liked was having the see/think/wonder anchor chart. I feel like this was a really good visual for students and a good way to engage them as well. They asked some really intriguing questions in the “wonder” section. I think that as far as improvement goes, I could have made the process of creating the “Underwater Cave” chart much cleaner. Practicing this process myself beforehand would have helped me to predict what challenges the students would

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run into and how to cut down time. I think I can also cut down time for partner talks. I still like using these, but I wonder if maybe I am giving the students too much time to talk which is allowing them to get distracted. My goal for tomorrow is to anticipate procedural hiccups and prevent them, shorten the partner talk time, and to prepare well thought-out questions for the video.

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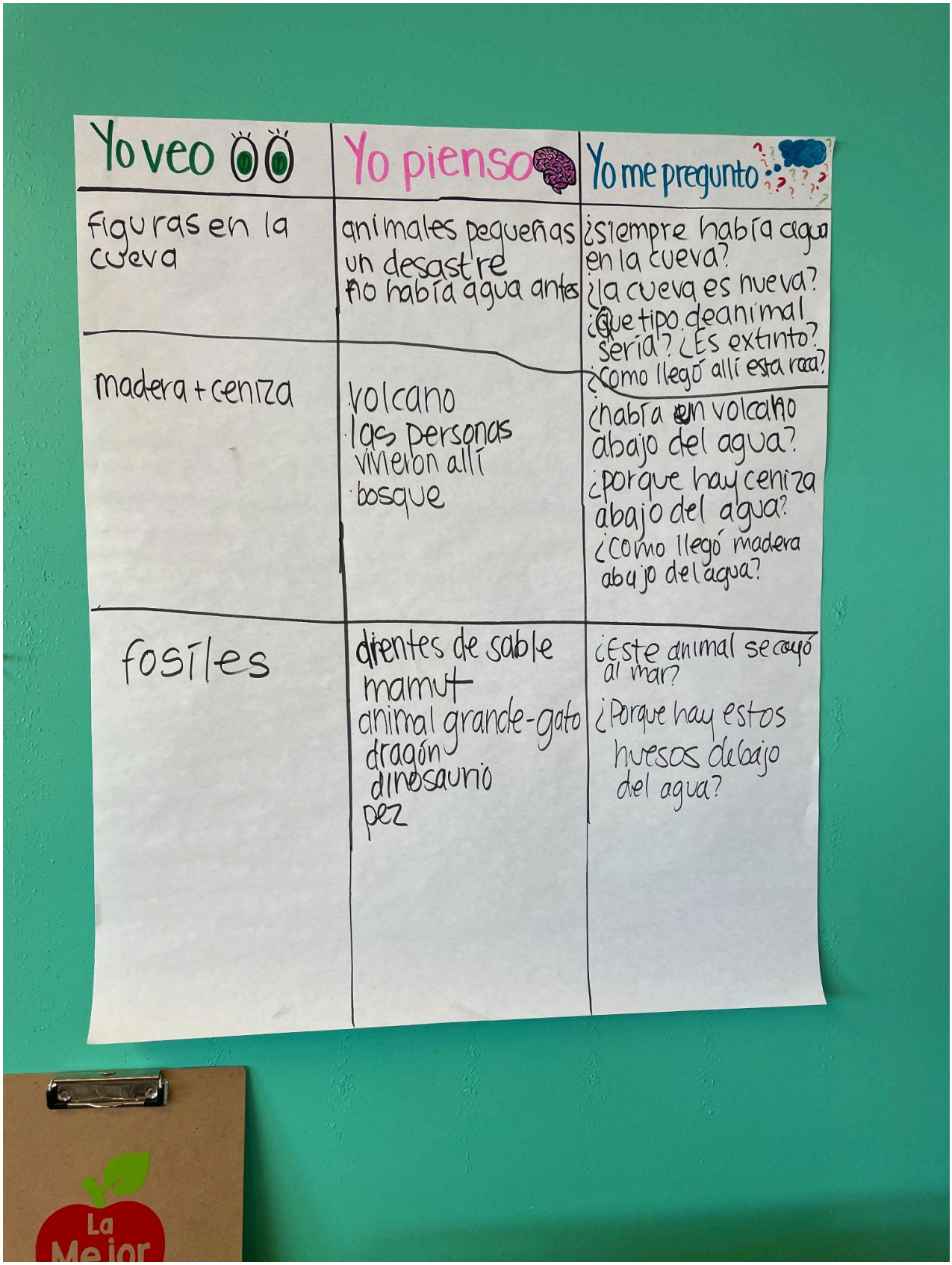

Yo veo	Yo pienso	Yo me pregunto
figuras en la cueva	animales pequeñas un desastre no había agua antes	¿siempre había agua en la cueva? ¿la cueva es nueva? ¿Que tipo de animal sería? ¿Es extinto? ¿como llegó allí esta roca?
madera + ceniza	volcano las personas vivieron allí bosque	¿había un volcano abajo del agua? ¿porque hay ceniza abajo del agua? ¿como llegó madera abajo del agua?
fosiles	dientes de sable mamut animal grande-gato dragón dinosaurio pez	¿este animal se cayó al mar? ¿Porque hay estos huesos debajo del agua?

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Lesson 2: Whales in the Desert (Egypt)

Date: October 6, 2022

Standard:

4.1.3 Analyze and interpret data from fossils to provide evidence of the stability and change in organisms and environments from long ago. Emphasize using the structures of fossils to make inferences about ancient organisms. Examples of fossils and environments could include comparing a trilobite with a horseshoe crab in an ocean environment or using a fossil footprint to determine the size of a dinosaur. (LS4.A)

Objective: Students will be able to explain how fossils show us that habitats have changed over time.

Student Friendly Objective: I can tell a friend how fossils show us that habitats have changed over time.

Yo puedo decir a un amigo como los fósiles demuestran un cambio en los ambientes a través del tiempo.

Differentiation:

Make sure each student is getting a chance to share their ideas in partner talks. Address listening to one another at the beginning. Check in with the following students: Iker, Eric, Michael, Fabien, Tony, and AJ (Are their partners giving them the chance to talk? If not– correct this). Set 1 minute timers– by the end, both partners need to have shared their ideas.

Resources:

- Mystery Science Investigation
- Anchor Phonomenon Connection
- See/Think/Wonder Chart
- Science Notebooks
- Glue
- Scissors
- 3 pieces of tape/student
- Fossil Dig Worksheet
- Fossils Dig Questions
- Mystery Fossils

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Assessments:

a) **Formative:**
Answers as a group
Partner discussions

b) **Summative:**
Fossil Dig Worksheet and Question answers

Procedures:

a) **Investigation:**

➢ Whales in the Desert (Mystery Science)
➢ Pause to ask questions throughout (questions indicated on the sticky notes below).

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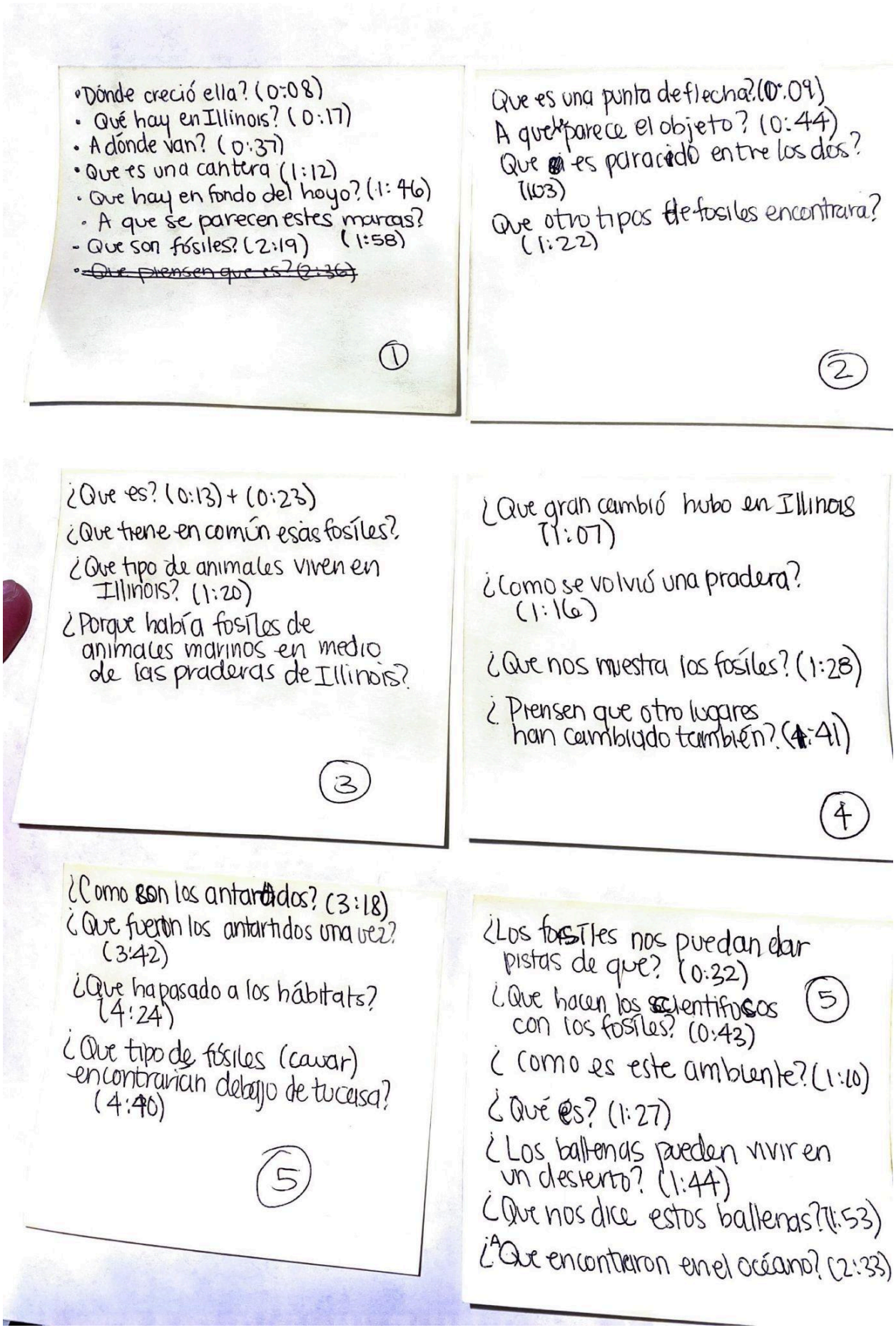
•Dónde creció ella? (0:08)
• Qué hay en Illinois? (0:17)
• A dónde van? (0:37)
• Que es una cantera (1:12)
• Que hay en fondo del hoyo? (1:46)
• A que se parecen estes marcas? (1:58)
- Que son fósiles? (2:19)
• ~~Que piensen que es? (2:36)~~
1
Que es una punta de flecha? (0:09)
A que parece el objeto? (0:44)
Que es parecido entre los dos? (1:03)
Que otro tipos de fosiles encontrara? (1:22)
2
¿Que es? (0:13) + (0:23)
¿Que tiene en común esas fosíles?
¿Que tipo de animales viven en Illinois? (1:20)
¿Porque había fosíles de animales marinos en medio de las praderas de Illinois?
3
¿Que gran cambió hubo en Illinois (1:07)
¿Como se volvió una pradera? (1:16)
¿Que nos muestra los fosíles? (1:28)
¿Prensen que otro lugares han cambiado también? (4:41)
4
¿Como son los antartidos? (3:18)
¿Que fueron los antartidos una vez? (3:42)
¿Que ha pasado a los hábitats? (4:24)
¿Que tipo de fósiles (cavar) encontrarian debajo de tu casa? (4:40)
5
¿Los fosíles nos puedan dar pistas de que? (0:32)
¿Que hacen los scientificos con los fosíles? (0:43)
5
¿ como es este ambiente? (1:10)
¿Qué es? (1:27)
¿Los ballenas pueden vivir en un desierto? (1:44)
¿Que nos dice estos ballenas? (1:53)
¿Que encontraron en el océano? (2:33)

b) Individual Practice:

➢ Fossil Dig Worksheet/Questions: Now students will be able to complete the fossil dig investigation. Hand out the worksheets to students. Make sure they all have 3 pieces of tape, scissors, glue, and a pencil. The mystery science video will guide them step-by-step.

➢ Students will be expected to observe the fossils in Layers A and B and notice a pattern. They will then be required to place the mystery fossils in the corresponding layer based on their observations of layers A and B. The video will also prompt them to answer reflection questions as they go throughout the process. These questions will ask them about characteristics they notice in each fossil. Then they will need to determine if the layer was on earth or in the ocean. At the end, they will need to respond to the question of whether the habitats changed based on the two layers of habitats that they observed.

Closure:

➢ Anchor phenomenon connection
➢ Read slides chorally.
➢ Have students complete the "After" Section of their "Underwater Cave" chart in their notebooks for the footprints, wood/ash, and bones.
➢ Discussion: How did learning about how environments change change your thoughts about the cave from yesterday to today?

Reflection:

I think that the questions I asked helped keep the students engaged during the videos. That being said, I think I could have used some other ways to have the students answer the questions in

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order to mix things up a bit as some students started to zone out near the end. I could use some of the engagement strategies that I researched a few weeks ago or have questions that students actively answer to help them practice active listening. It also seems from the fossil excavation worksheet, that fewer students understood the change that occurred in the habitat that I had originally thought. Luckily, this is something that we will be talking about a lot in the next few weeks. Still, I want to make sure that all the students understand this and make sure that they do through many formative assessments in the coming weeks.

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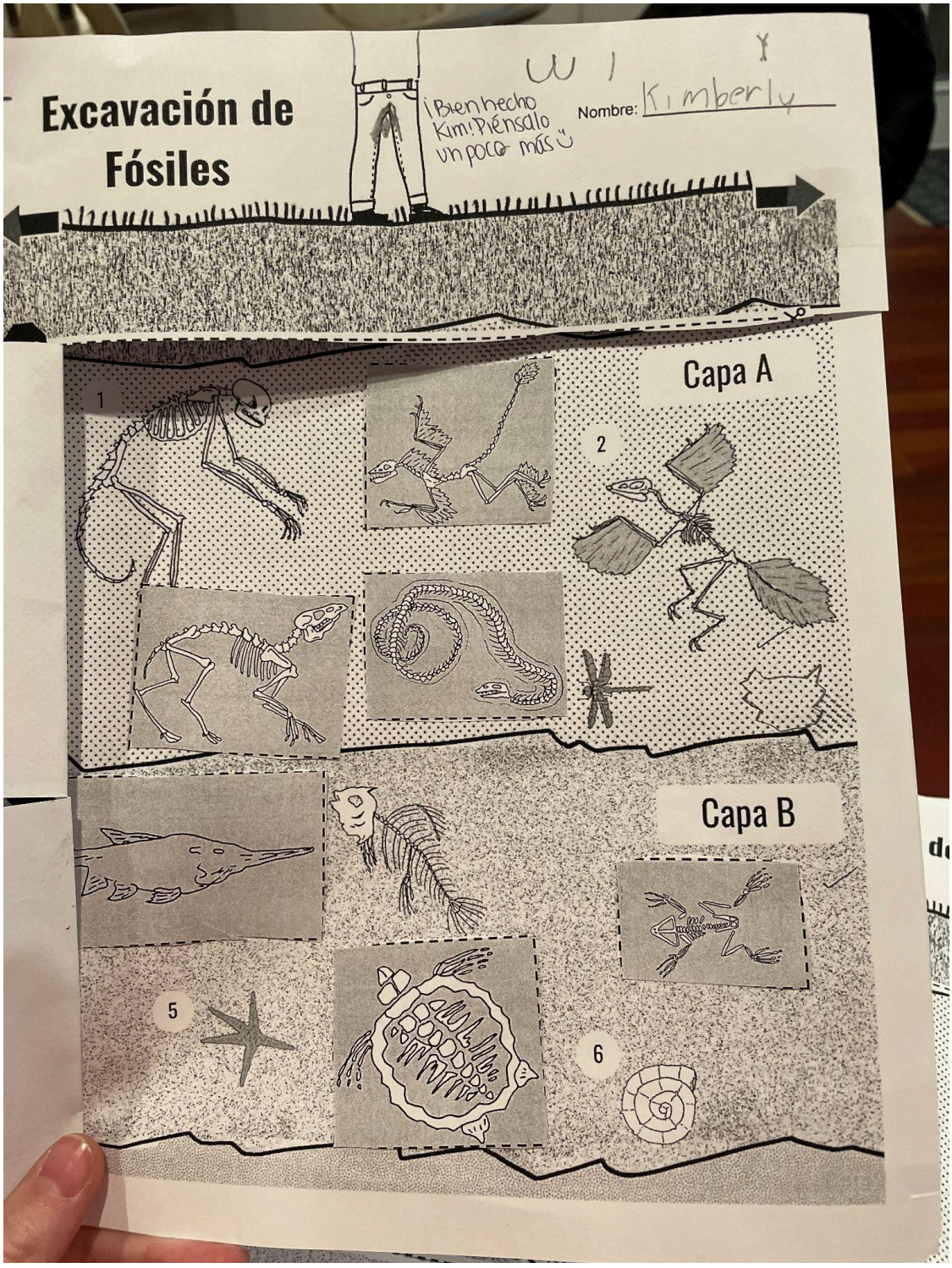
Excavación de Fósiles
¡Bien hecho Kim! Piénsalo un poco más
Nombre: Kimberly
Capa A
Capa B
1
2
5
6

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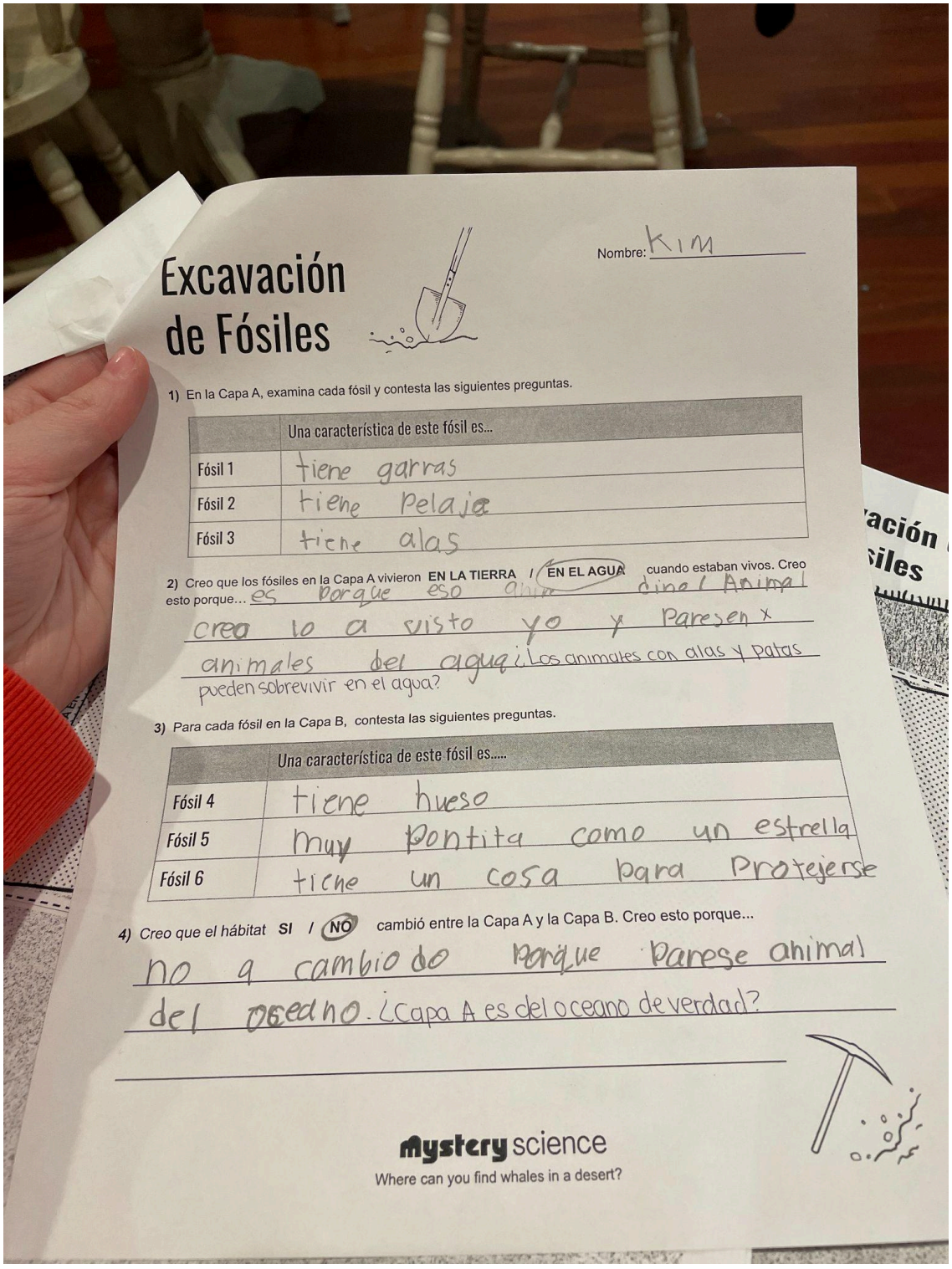

Excavación de Fósiles

Nombre: Kim

1) En la Capa A, examina cada fósil y contesta las siguientes preguntas.

	Una característica de este fósil es...
Fósil 1	tiene garras
Fósil 2	tiene pelaja
Fósil 3	tiene alas

2) Creo que los fósiles en la Capa A vivieron **EN LA TIERRA** / **EN EL AGUA** cuando estaban vivos. Creo esto porque... es porque eso ahí dino / Animal creo lo a visto yo y Paresen x animales del agua ¿Los animales con alas y patas pueden sobrevivir en el agua?

3) Para cada fósil en la Capa B, contesta las siguientes preguntas.

	Una característica de este fósil es.....
Fósil 4	tiene hueso
Fósil 5	muy pontita como un estrella
Fósil 6	tiene un cosa para Protejerse

4) Creo que el hábitat **SI** / **NO** cambió entre la Capa A y la Capa B. Creo esto porque... no a cambiado porque Paresе animal del oceano. ¿Capa A es del oceano de verdad?

Mystery science

Where can you find whales in a desert?

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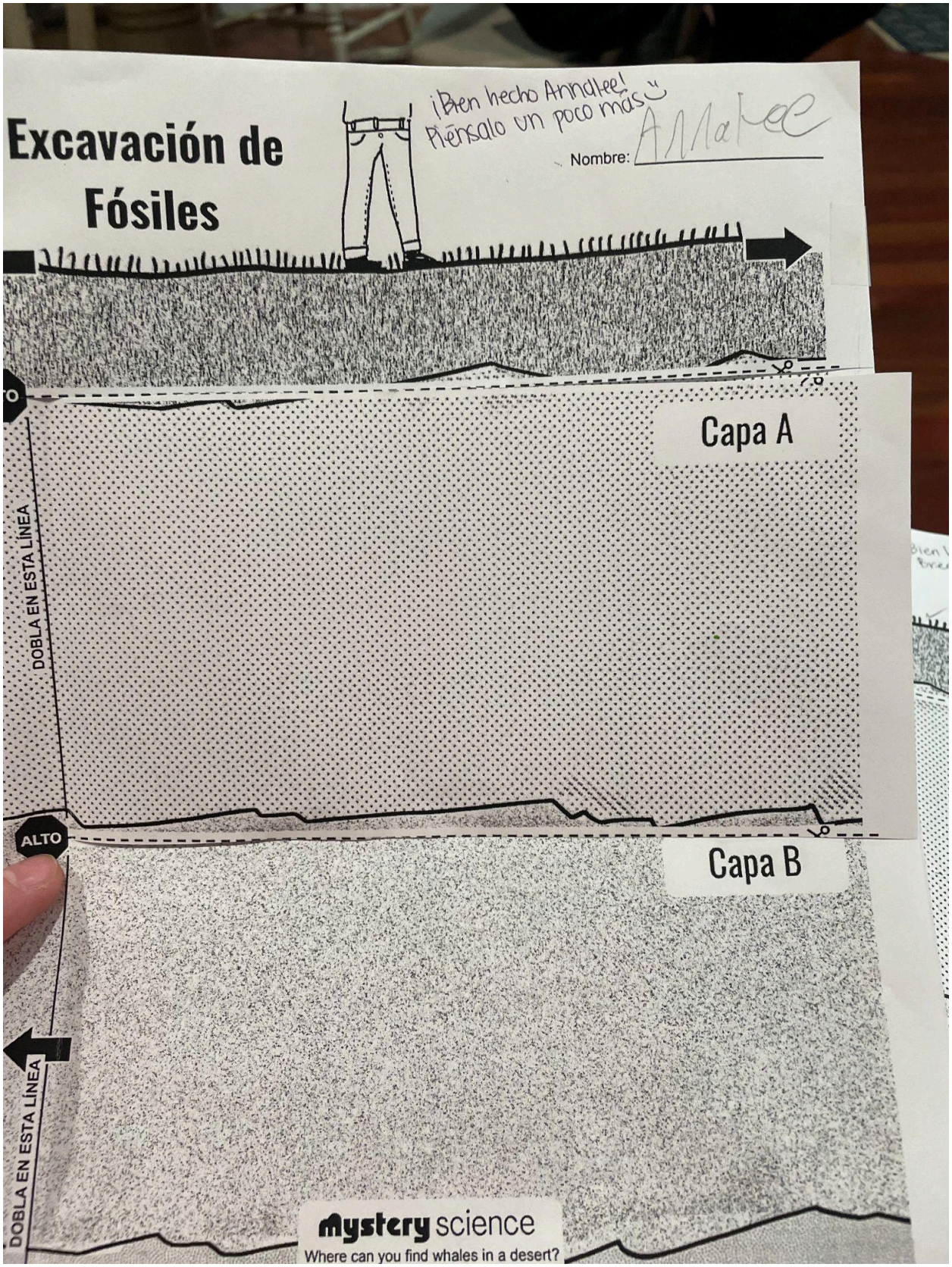
Excavación de Fósiles
¡Bien hecho Annalee! Piensalo un poco más
Nombre: Annalee
Capa A
Capa B
DOBLA EN ESTA LÍNEA
ALTO
DOBLA EN ESTA LÍNEA
Mystery science
Where can you find whales in a desert?

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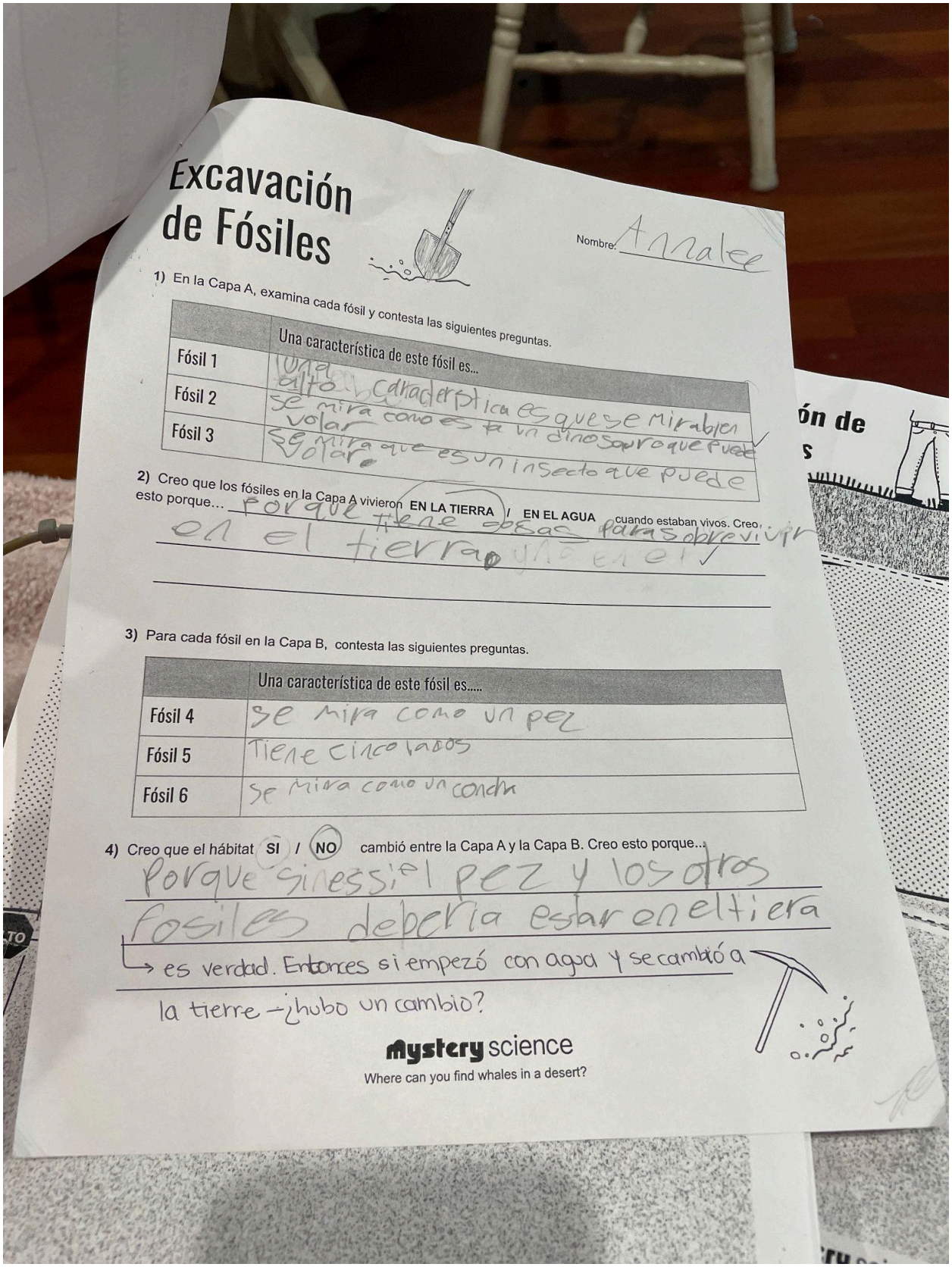

Excavación de Fósiles

Nombre: Annalee

1) En la Capa A, examina cada fósil y contesta las siguientes preguntas.

	Una característica de este fósil es...
Fósil 1	Una característica es que se mira bien alto
Fósil 2	se mira como es un dinosaurio que puede volar
Fósil 3	se mira que es un insecto que puede volar

2) Creo que los fósiles en la Capa A vivieron **EN LA TIERRA** / **EN EL AGUA** cuando estaban vivos. Creo esto porque... porque tiene patas para sobrevivir en el tierra no en el agua

3) Para cada fósil en la Capa B, contesta las siguientes preguntas.

	Una característica de este fósil es.....
Fósil 4	se mira como un pez
Fósil 5	Tiene circulados
Fósil 6	se mira como un concha

4) Creo que el hábitat **SI** / **NO** cambió entre la Capa A y la Capa B. Creo esto porque...
porque si es si el pez y los otros fosiles deberia estar en el tiera
→ es verdad. Entonces si empezó con agua y se cambió a la tierre - ¿hubo un cambio?

Mystery science
Where can you find whales in a desert?

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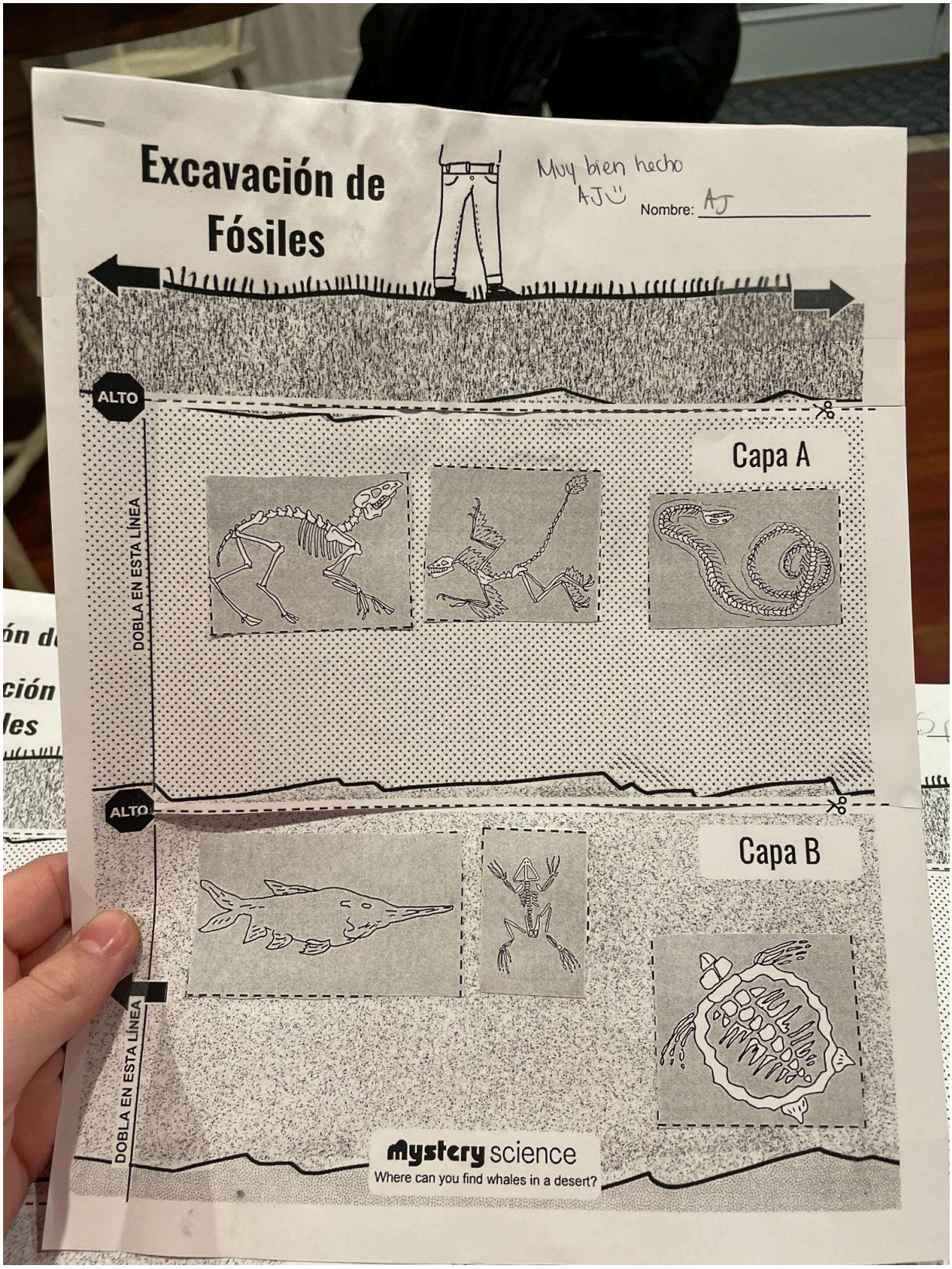
Excavación de Fósiles
Muy bien hecho AJ
Nombre: AJ
ALTO
DOBLA EN ESTA LÍNEA
Capa A
ALTO
Capa B
DOBLA EN ESTA LÍNEA
Mystery science
Where can you find whales in a desert?

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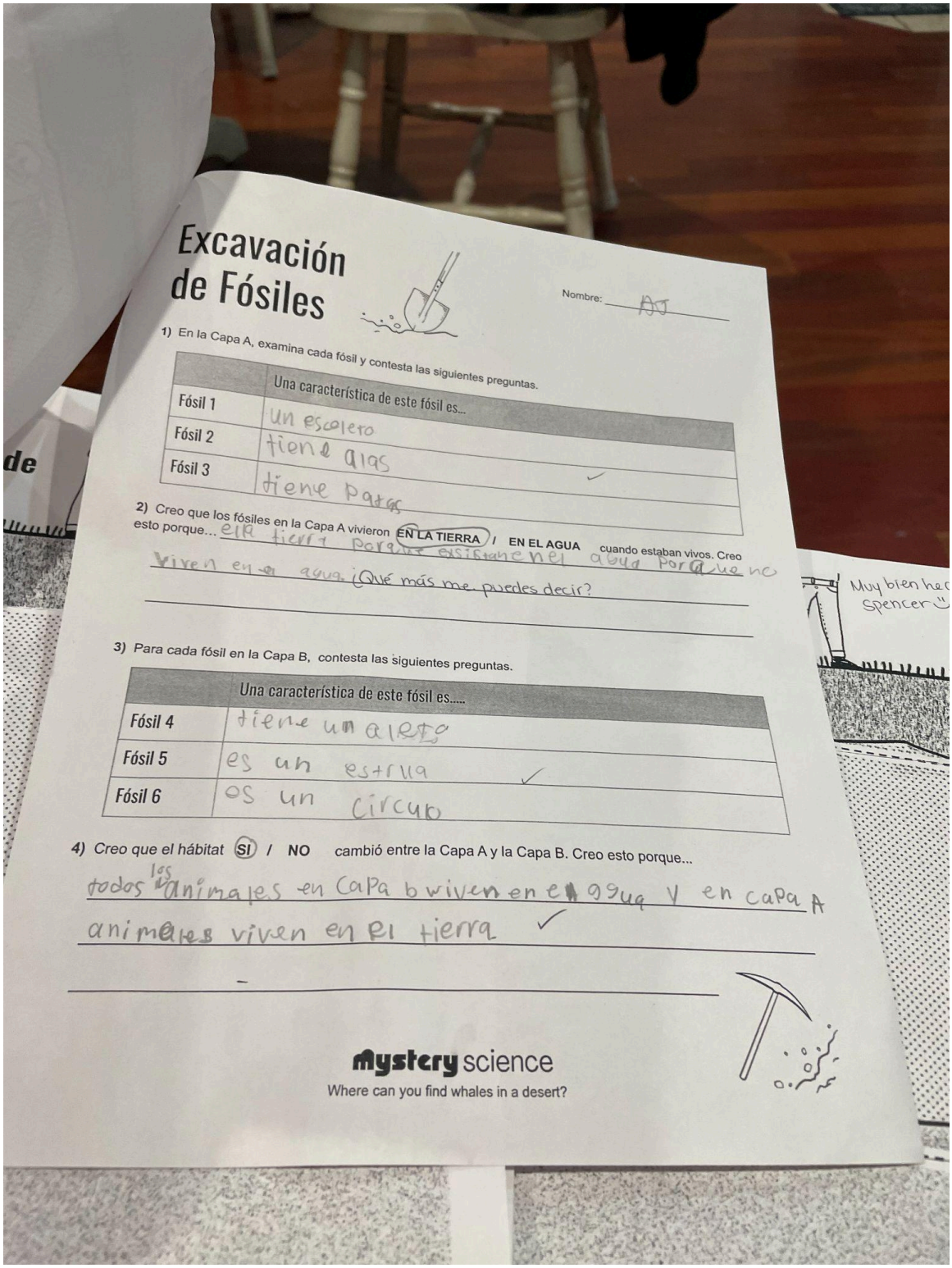

Excavación de Fósiles

Nombre: AJ

1) En la Capa A, examina cada fósil y contesta las siguientes preguntas.

	Una característica de este fósil es...
Fósil 1	un escalero
Fósil 2	tiene alas ✓
Fósil 3	tiene patas

2) Creo que los fósiles en la Capa A vivieron (EN LA TIERRA) / EN EL AGUA cuando estaban vivos. Creo esto porque... ella tierra porque existe en el agua porque no viven en el agua. ¿Qué más me puedes decir?

3) Para cada fósil en la Capa B, contesta las siguientes preguntas.

	Una característica de este fósil es.....
Fósil 4	tiene un ala
Fósil 5	es un estrella ✓
Fósil 6	es un circulo

4) Creo que el hábitat (SI) / NO cambió entre la Capa A y la Capa B. Creo esto porque...

todos los animales en Capa b viven en el agua y en capa A animales viven en el tierra ✓

mystery science

Where can you find whales in a desert?

Muy bien he... Spencer

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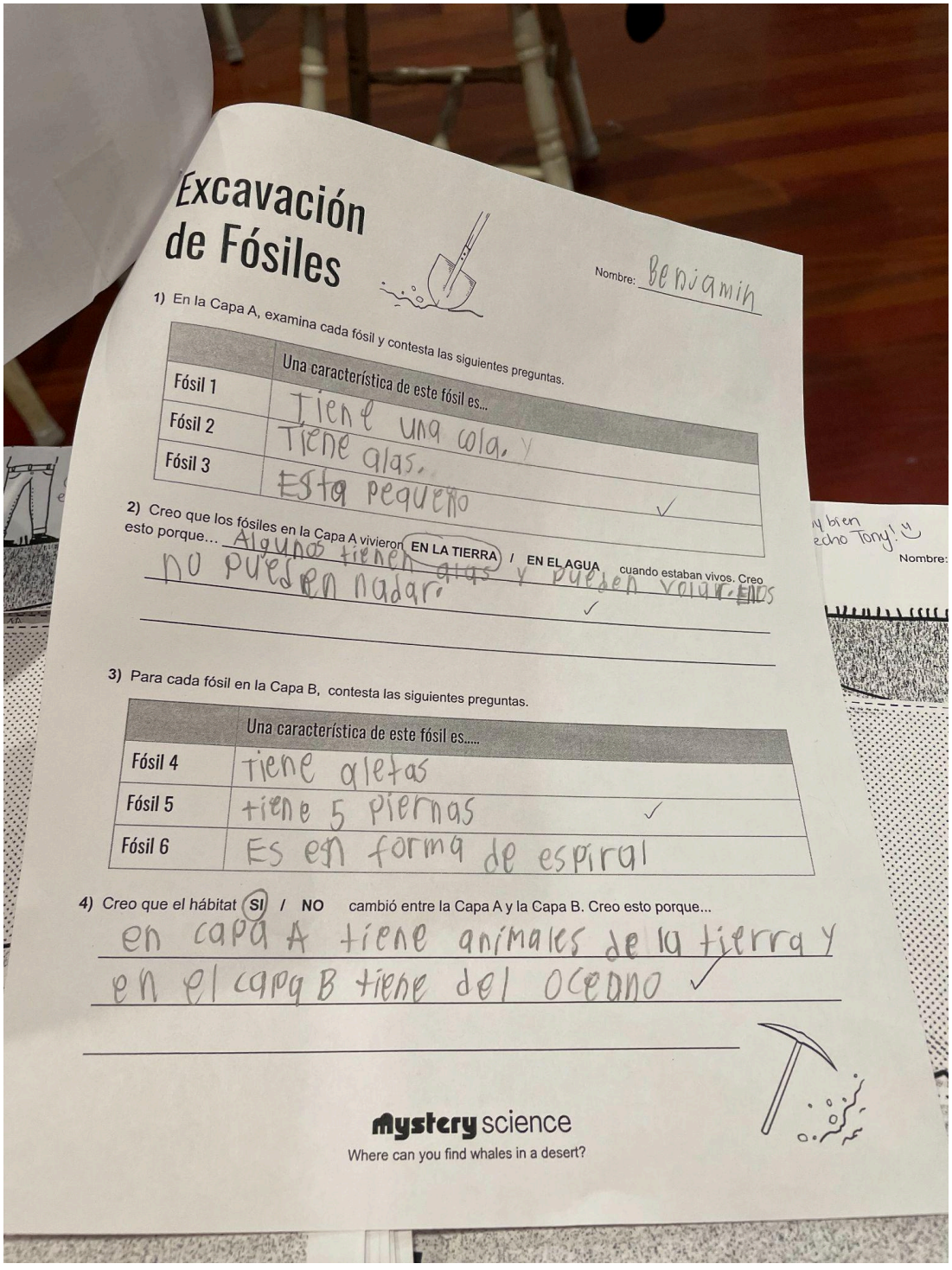

Excavación de Fósiles

Nombre: Benjamin

1) En la Capa A, examina cada fósil y contesta las siguientes preguntas.

	Una característica de este fósil es...
Fósil 1	Tiene una cola.
Fósil 2	Tiene alas.
Fósil 3	Esta pequeño ✓

2) Creo que los fósiles en la Capa A vivieron **EN LA TIERRA** / **EN EL AGUA** cuando estaban vivos. Creo esto porque... Algunos tienen alas y pueden volar. Ellos no pueden nadar. ✓

3) Para cada fósil en la Capa B, contesta las siguientes preguntas.

	Una característica de este fósil es.....
Fósil 4	tiene aletas
Fósil 5	tiene 5 piernas ✓
Fósil 6	Es en forma de espiral

4) Creo que el hábitat **SI** / **NO** cambió entre la Capa A y la Capa B. Creo esto porque...

en capa A tiene animales de la tierra y en el capa B tiene del oceano ✓

mystery science

Where can you find whales in a desert?

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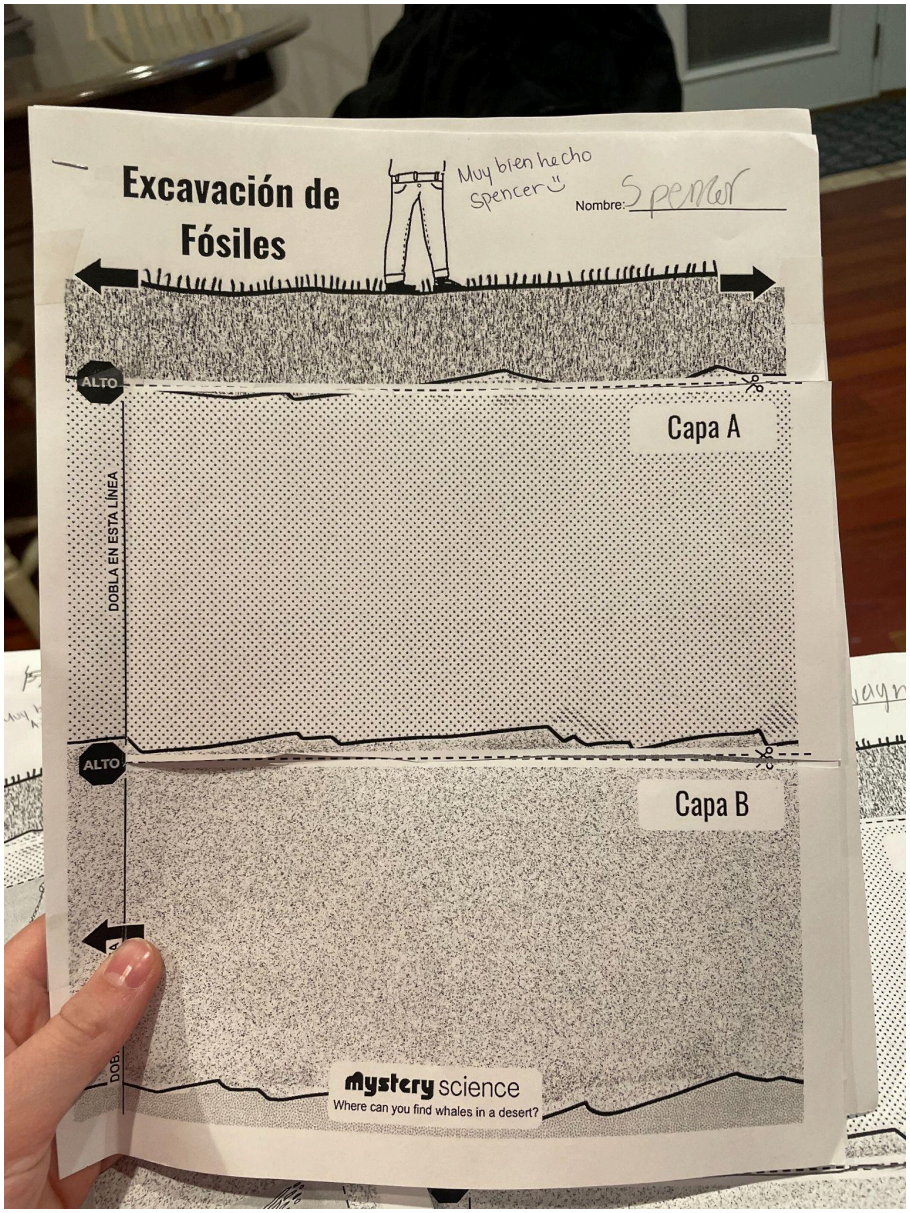
Excavación de Fósiles
Muy bien hecho Spencer
Nombre: Spencer
ALTO
DOBLA EN ESTA LÍNEA
Capa A
ALTO
Capa B
mystery science
Where can you find whales in a desert?

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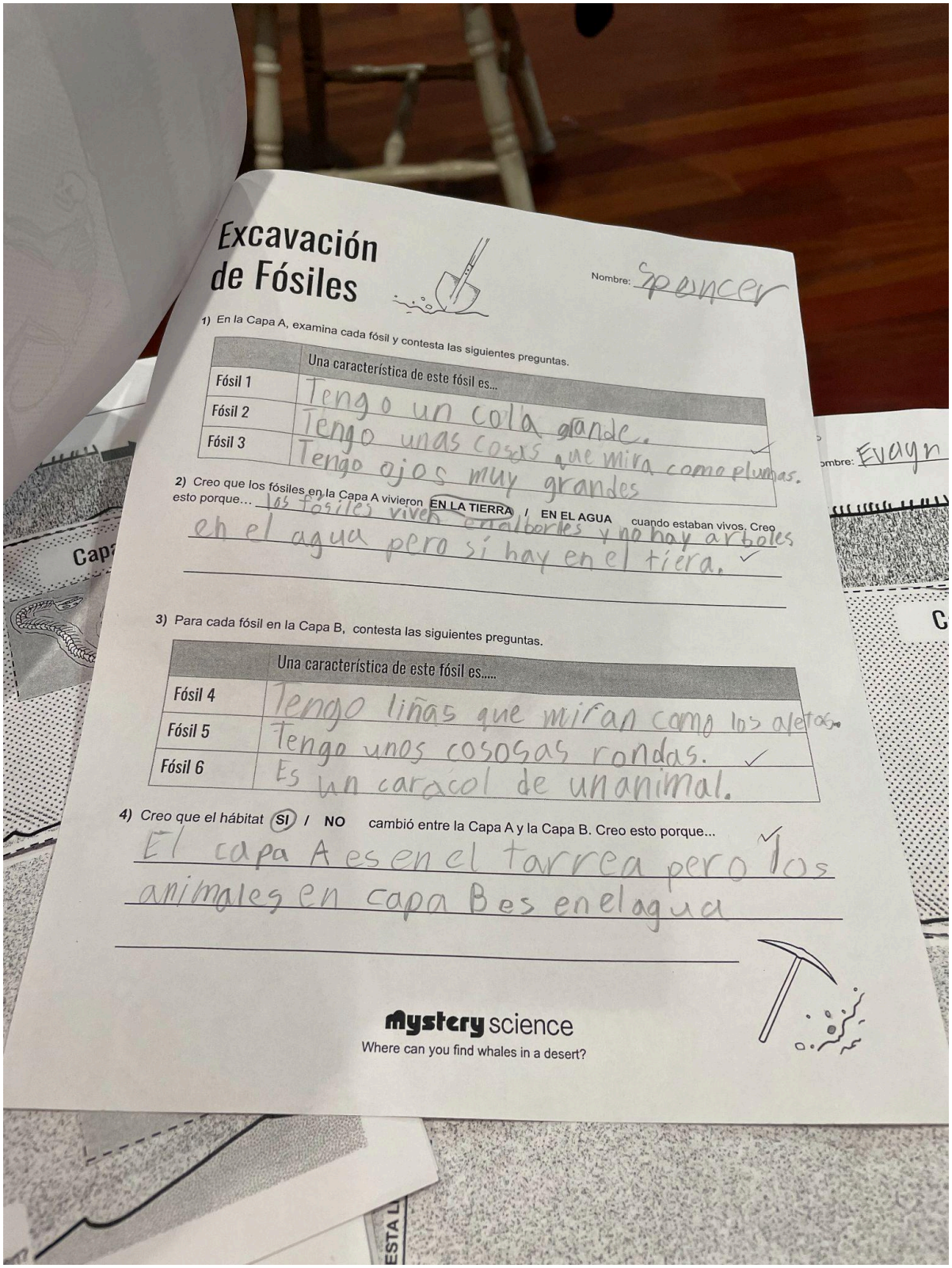

Excavación de Fósiles

Nombre: Spencer

1) En la Capa A, examina cada fósil y contesta las siguientes preguntas.

	Una característica de este fósil es...
Fósil 1	Tengo un cola grande.
Fósil 2	Tengo unas cosas que mira como plumas.
Fósil 3	Tengo ojos muy grandes

2) Creo que los fósiles en la Capa A vivieron **EN LA TIERRA** / **EN EL AGUA** cuando estaban vivos. Creo esto porque... los fósiles viven en alborles y no hay arboles en el agua pero si hay en el tiera.

3) Para cada fósil en la Capa B, contesta las siguientes preguntas.

	Una característica de este fósil es.....
Fósil 4	Tengo liñas que miran como los aletas.
Fósil 5	Tengo unos cososas rondas.
Fósil 6	Es un caracol de unanimal.

4) Creo que el hábitat **SI** / **NO** cambió entre la Capa A y la Capa B. Creo esto porque... El capa A es en el tarrea pero los animales en capa B es en el agua

mystery science

Where can you find whales in a desert?

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Lesson 3: They Found Whales (Chile)

Date: October 10, 2022

Standard:
4.1.3 Analyze and interpret data from fossils to provide evidence of the stability and change in organisms and environments from long ago. Emphasize using the structures of fossils to make inferences about ancient organisms. Examples of fossils and environments could include comparing a trilobite with a horseshoe crab in an ocean environment or using a fossil footprint to determine the size of a dinosaur. (LS4.A)

Objective: Students will be able to explain how fossils show us that habitats have changed over time.

Student Friendly Objective: I can tell a friend how fossils show us that habitats have changed over time.

Yo puedo decir a un amigo como los fósiles demuestran un cambio en los ambientes a través del tiempo.

Differentiation:

Eric Davlynn, Kensi: These three were not here for the previous lesson on finding whales in the desert in Egypt. Make sure to recap this lesson at the beginning so these students are caught up. Have students share with their partners what they remembered from the previous lesson and discuss as a class.

Abraham, Kim: These students both scored 0 on the previous assessments. Focus on listening to their conversations during partner talks and ask questions to help correct their misconceptions.

Resources:

- Encontraron una ballena Slides
- Exit Ticket (linked in slides)
- Mystery Science text (copy for each student)
- Six square blank comic strip for each student
- Pencils

Assessments:

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a) **Formative:**
Answers as a group
Partner discussions
Comic strip drawings

b) **Summative:**
Google Form

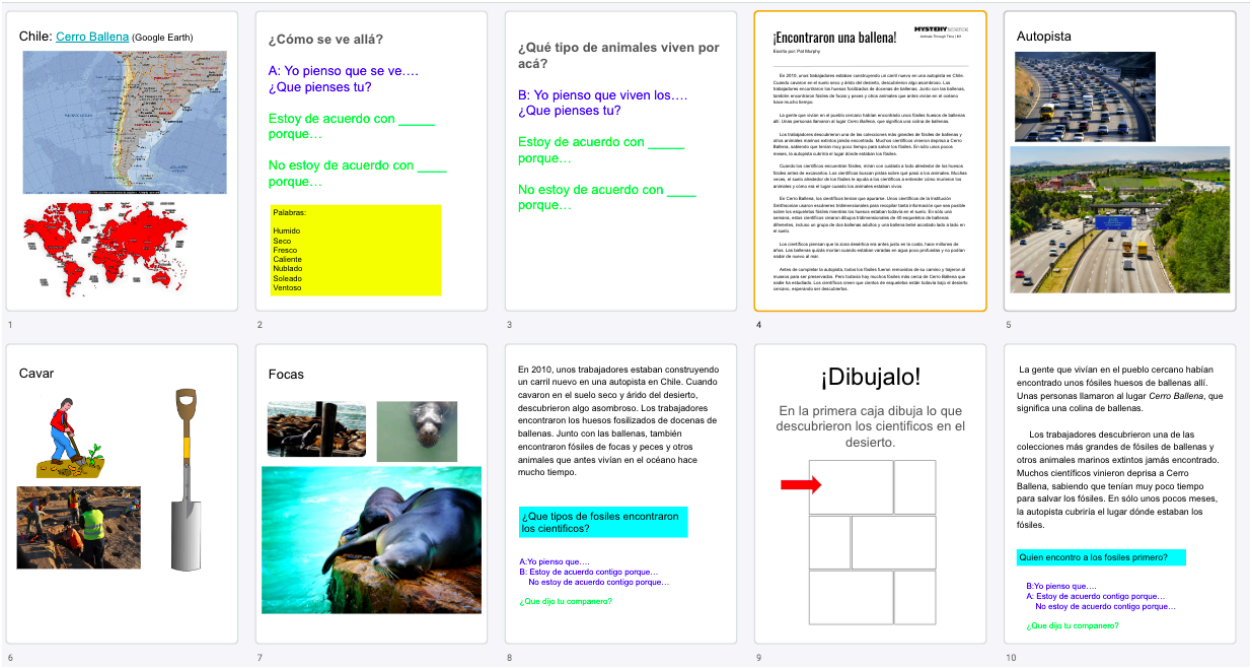
Procedures:

a) **Activating prior knowledge:**
Explore "Cerro Ballena" in Chile on Google Maps.
Students will discuss the following questions (Sentence frames and suggested vocabulary provided in slides):
-What does the environment look like there?
-What kinds of animals do you think live there?

b) **Guided Practice:**
For each of the 6 sections of the text we will:

- Preview Vocabulary
- Read chorally
- Answer questions (Think pair share): Sentence frames provided
- Draw what is happening in the comic strip box.

See the slides for a breakdown of the guided practice procedures:



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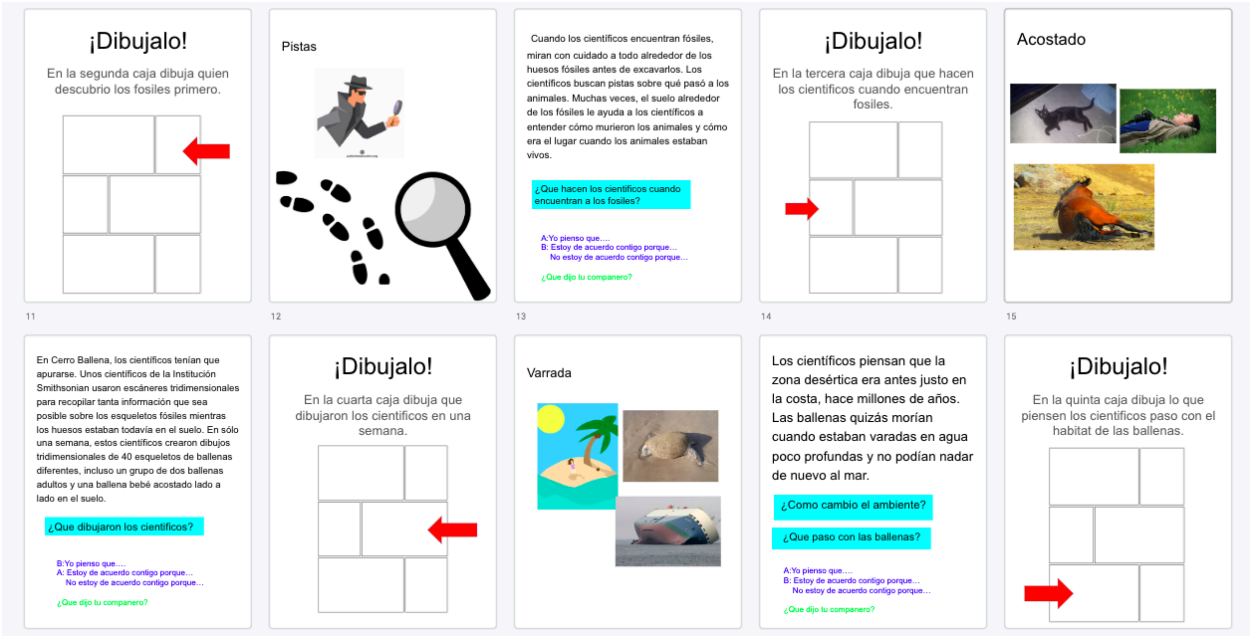

Closure:

Think/pair/share for the following three questions:

- What do the whale fossils in Chile teach us about the habitat in Chile?
- Has the habitat at Whale Hill changed from millions of years ago until now?

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- What did the story we studied about whales in Chile have in common with the story about the whales in Egypt?

Have students take the Google Form exit ticket.

Reflection:

Students responded really well to the comic strip drawings. This kept them engaged in the text and helped them to reflect on what they were reading. It was also a really good way for me to see what they understood from the text and make adjustments as we go. One thing that I would do differently next time is to begin by previewing the previous lesson a little bit more. While we previewed it a little bit, asking the question of what whales in the desert in Egypt taught us would have helped the students to make a better connection of the overall pattern that they are seeing throughout the unit. This would help bring students back to our standard– the earth has changed– and we are seeing evidence of it.

Lesson Evidence: Comic strip drawings to go with each section of the text.

Box 1: What did the scientists find in the desert?
Box 2: Who found the fossils first?
Box 3: What do scientists do when they find fossils?
Box 4: What did the scientists draw within one week?
Box 5: What do the scientists think happened to the whales' habitat?
Box 6: What did the scientists do with the fossils?

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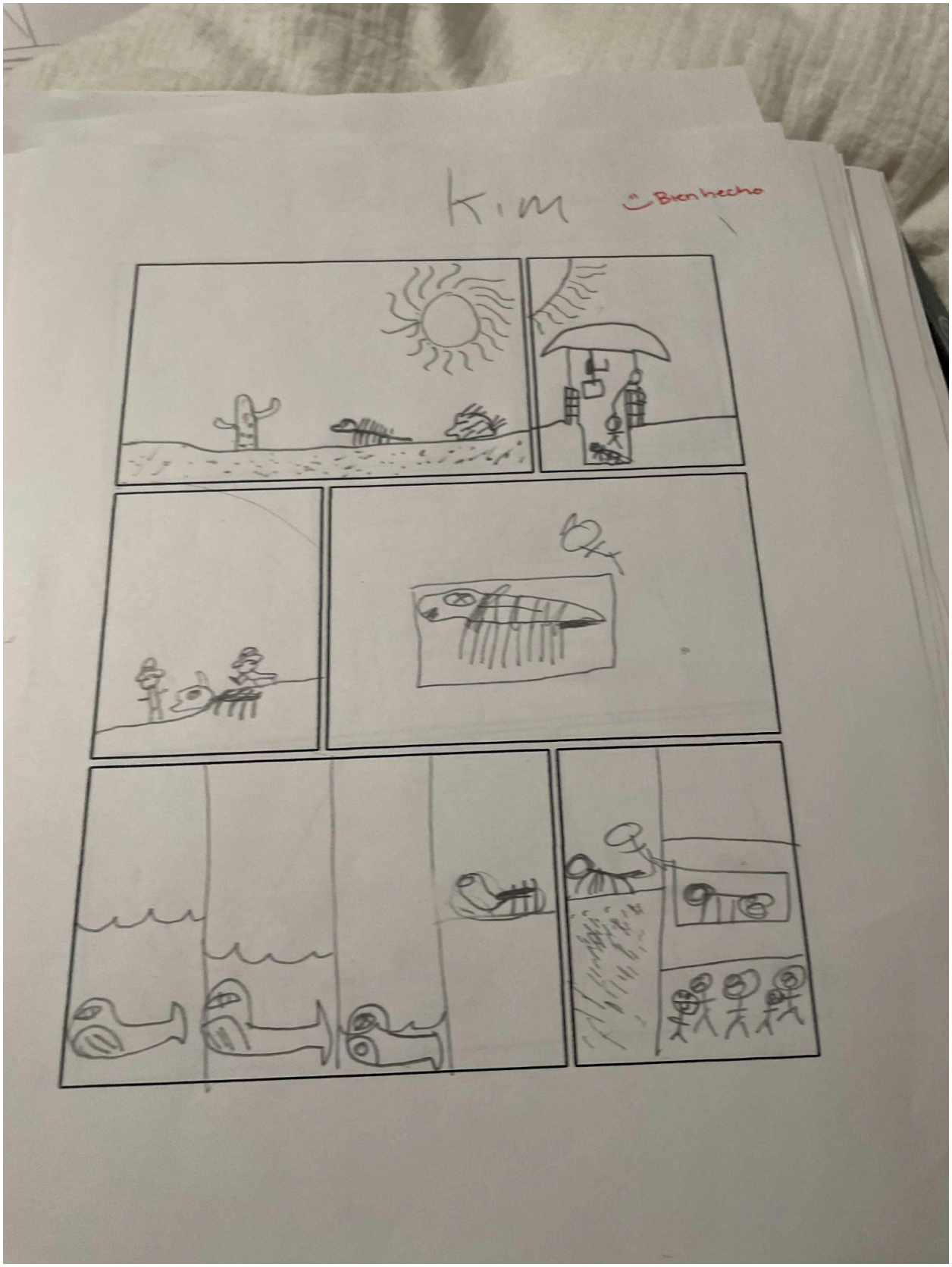

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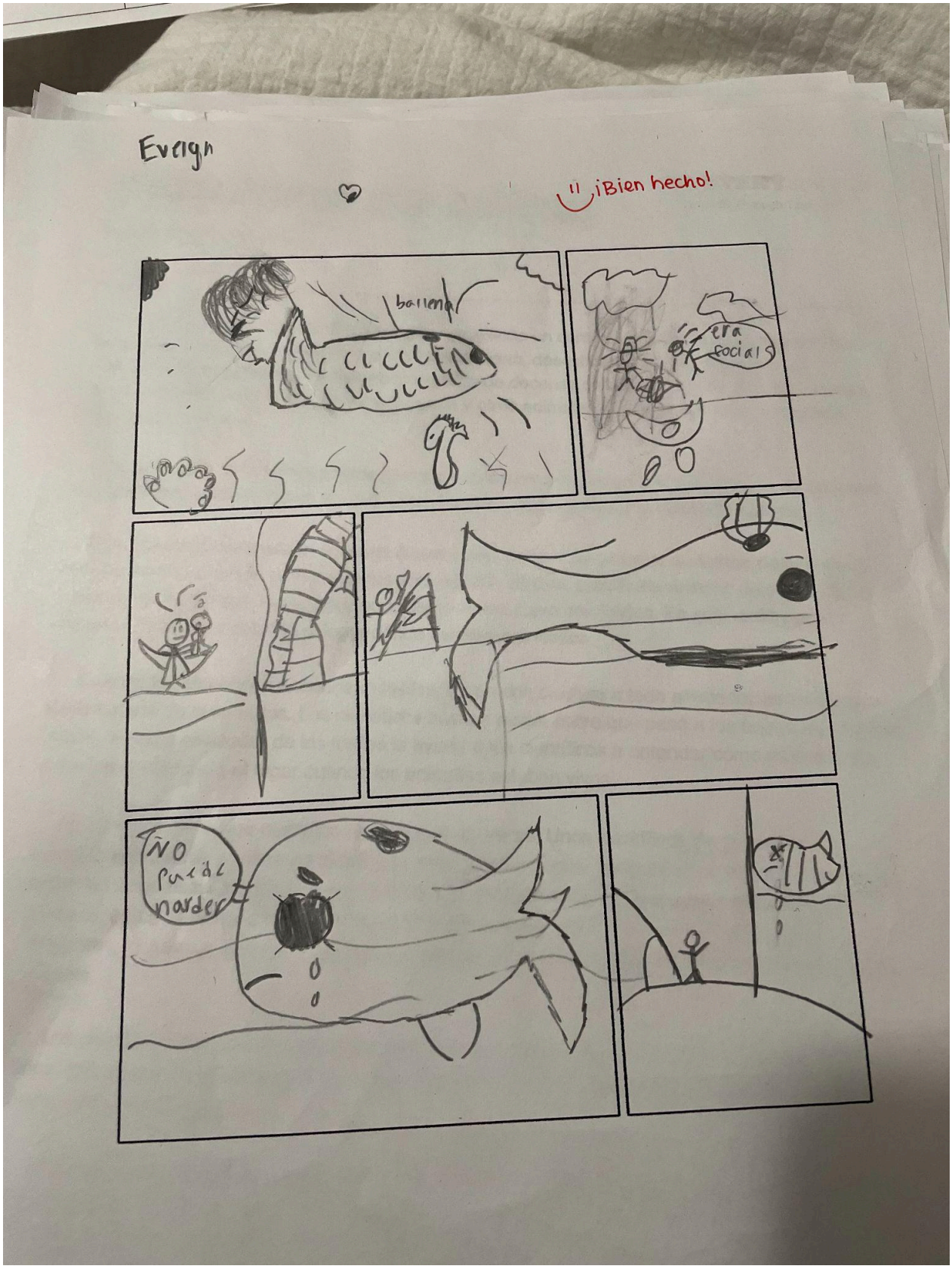

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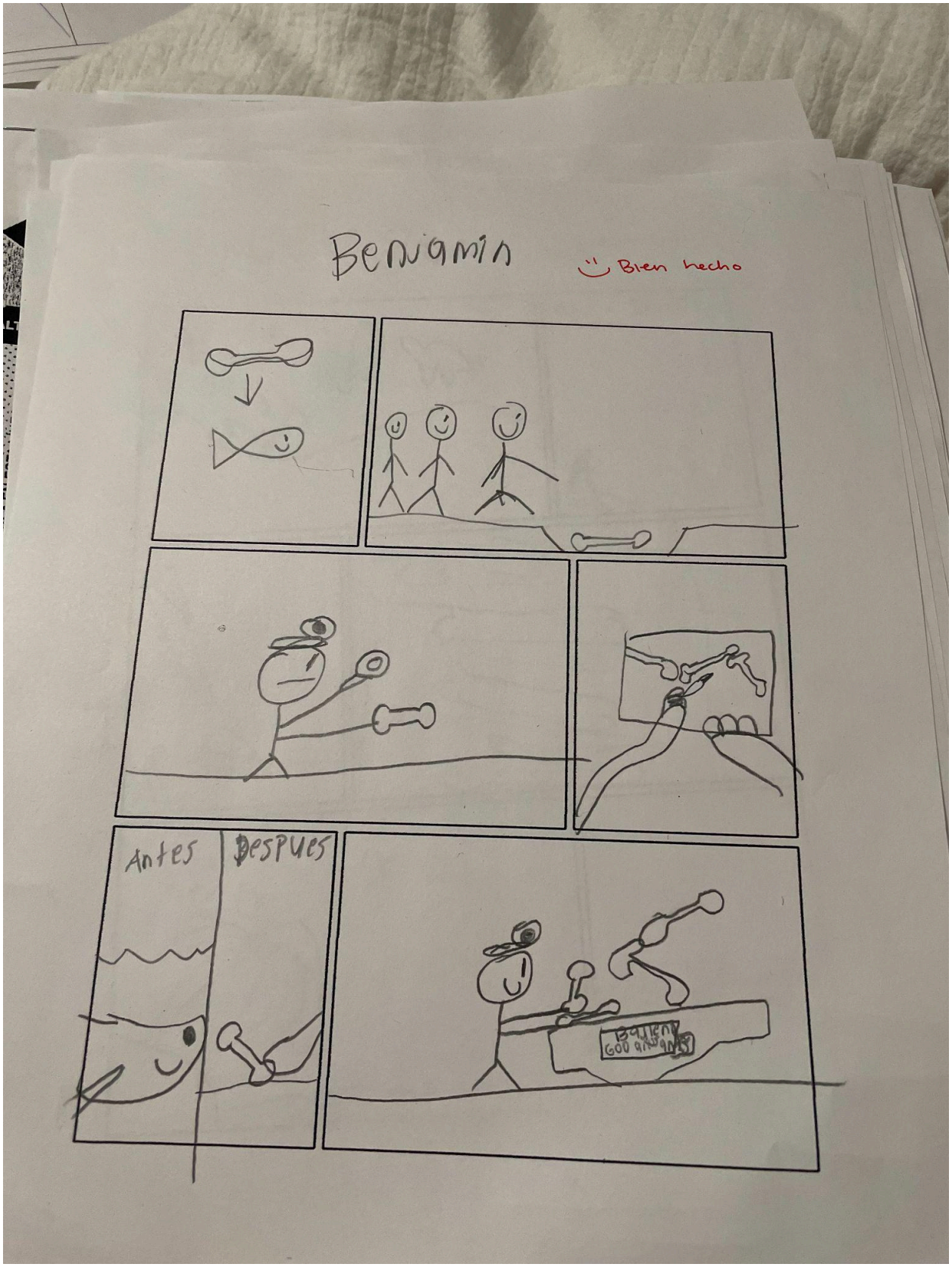

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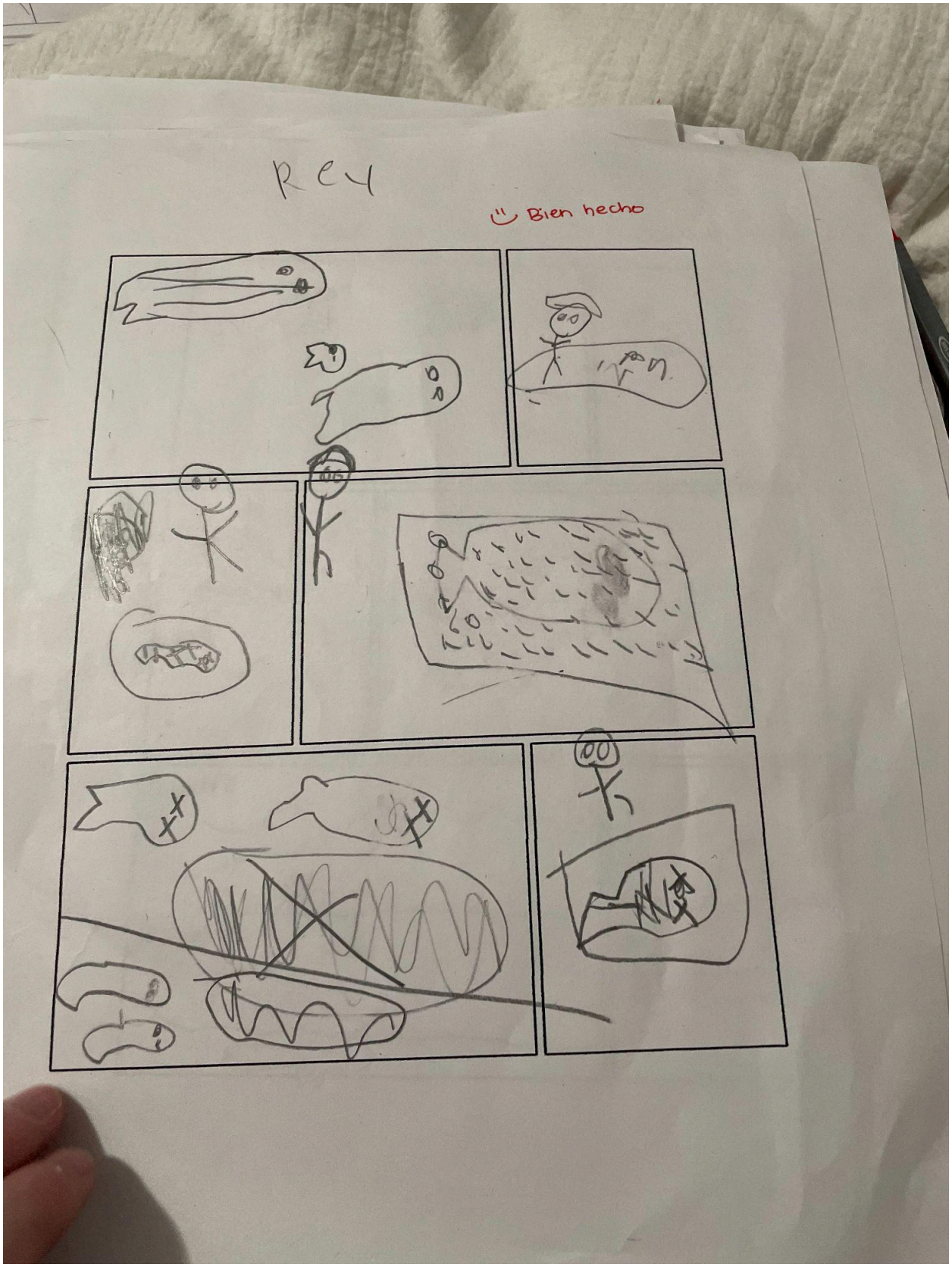

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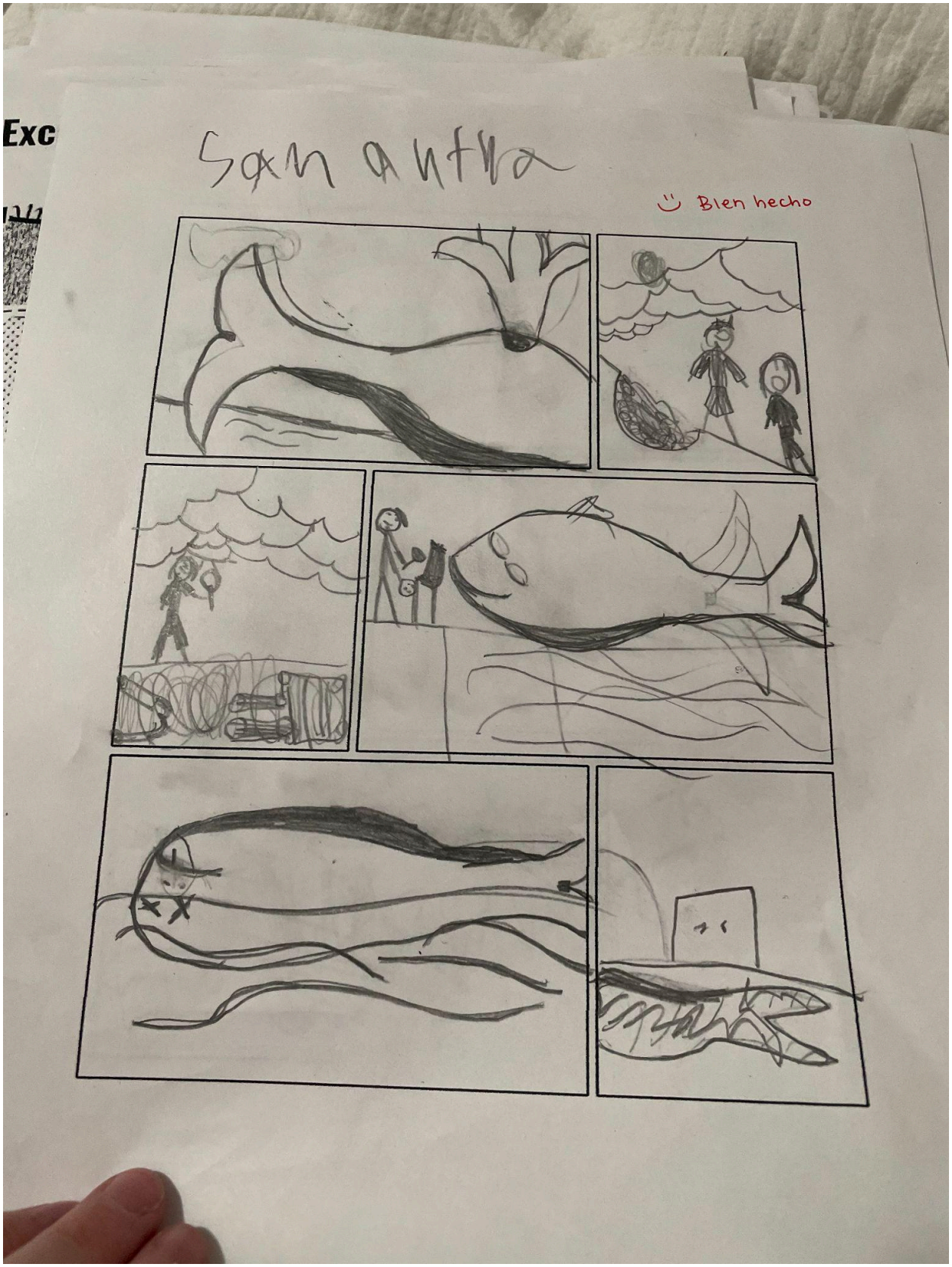

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Lesson 4: Fossil Dig

Date: October 11, 2022

Standard 4.1.3 Analyze and interpret data from fossils to provide evidence of the stability and change in organisms and environments from long ago. Emphasize using the structures of fossils to make inferences about ancient organisms. Examples of fossils and environments could include comparing a trilobite with a horseshoe crab in an ocean environment or using a fossil footprint to determine the size of a dinosaur. (LS4.A)

Standard 4.1.4 Engage in argument from evidence based on patterns in rock layers and fossils found in those layers to support an explanation that environments have changed over time. Emphasize the relationship between fossils and past environments. Examples could include tropical plant fossils found in Arctic areas and rock layers with marine shell fossils found above rock layers with land plant fossils. (ESS1.C)

4.MP.2: Reason abstractly and quantitatively.
4.MP.4: Model with mathematics.

Objective:

Students will be able to produce a timeline demonstrating the various depths of the earth and the fossils found within these layers based on the STEM Scope activity.

Differentiation:

Place the following students with strong partners based on the previous day's assessment: Cole, Kimberly, Iker, Eric, Michael, Abraham

Groups:

Cole, Spencer, Maurilio
Kim, Samantha
Iker, Valeria
Eric, AJ
Michael, Albert
Abraham, Benji
Annalee, Tony
Evelyn, Adrik

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Resources:

- Fossil cards
- Fossil Card Folders
- Fossil Card Keys
- Fossil Slides
- Fossil Worksheet

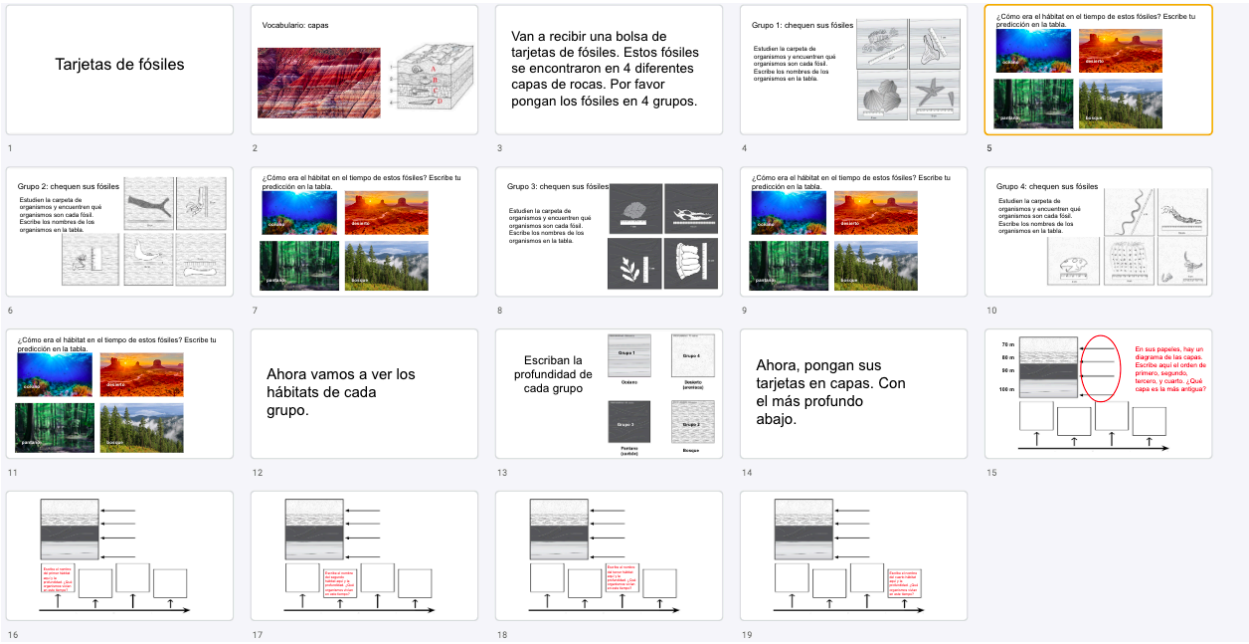
Assessments:

a) **Formative:**
Partner Discussions
Fossils Cards worksheet/Timeline

b) **Summative:**

Reflection Question

Procedures:



a) **Guided Practice:**

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- Each group will receive a bag with different fossil cards. They will also receive a folder with pictures of fossils.
- The students will first observe the fossil cards and place them into four distinct groups based on similarities that they see. They should notice the backgrounds of the cards.
- When all the students have placed their cards into four groups, the teacher will reveal the first group. Students will check that they have the correct fossils in their group.
- Students will then look at the folder to see which animals are in this group based on the fossils. For example, they might see on their card the foot of a cow and then be able to connect it to the cow body fossil. They will write down the animals that live in that habitat on their worksheets.
- Students will then make a prediction about which habitat these fossils were found in (ocean, desert, forest, or swamp). They will write their response on their worksheet under “predicted habitat”.
- Students will repeat this process for the next 3 groups until they have found out all the animals in each layer and made habitat prediction for each layer.
- Next, the teacher will reveal the actual habitats and their depth of each layer. Students will write down the actual habitats under “actual habitat” on their worksheets. They will compare their prediction with the actual habitat.
- Now, students will place the cards in layers based on the depths of each habitat. The ocean (100 meters) should be at the bottom, then the swamp (90 meters), the forest (80 meters), and finally the top layer will be the desert (70 meters).

Closure:

- On the timeline, students will start with the bottom layer which is the oldest and put this at the beginning of their timeline. They will write the name of the habitat and depth. They will then proceed with the following layers on the timeline going from oldest to youngest. This should emphasize that the older the layer is, the further down on the bottom it is.

Reflection in notebooks:

1) Which layer existed first according to the layers?
2) Which layer existed last according to the layers?
3) How can we see that the habitats have changed?

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Reflection:

I think that the students were really engaged as they discovered the different layers and animals based on the fossils. This activity was really good for allowing them to go through a scientific investigation and use their reasoning to question and problem solve. I think for the most part the grouping went really well too. One thing that I wish would have gone better is that I am not sure that the students really understood that the oldest layer is always on the bottom. The good thing is that we will be coming back to this concept tomorrow. However, if I were to do this lesson again, I would ask more questions to help guide my students to reach this conclusion. Also, I accidentally had students write down the animals on the timeline for each layer instead of the depths. This honestly may have contributed to their misunderstanding of the layers' ages.

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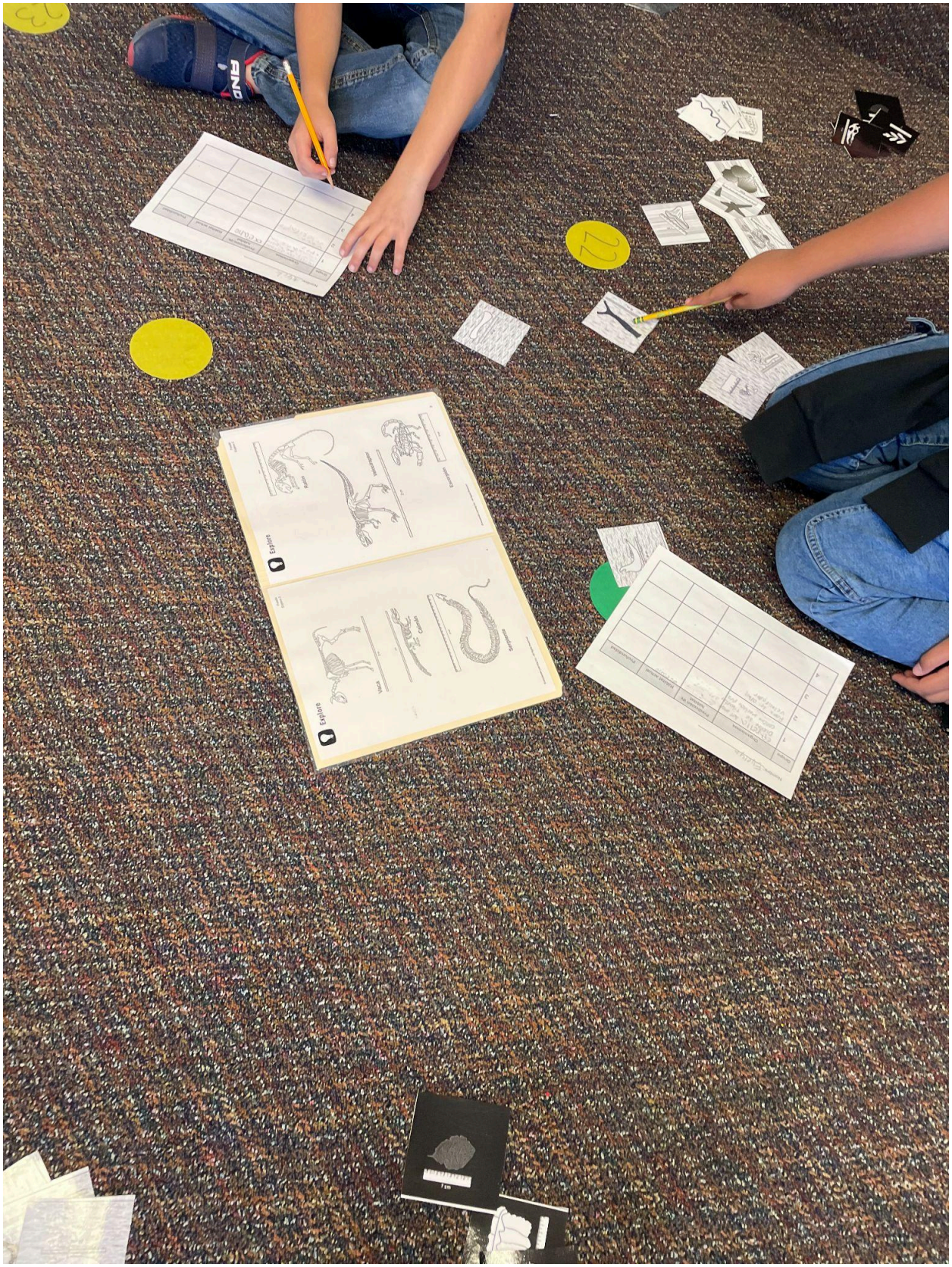

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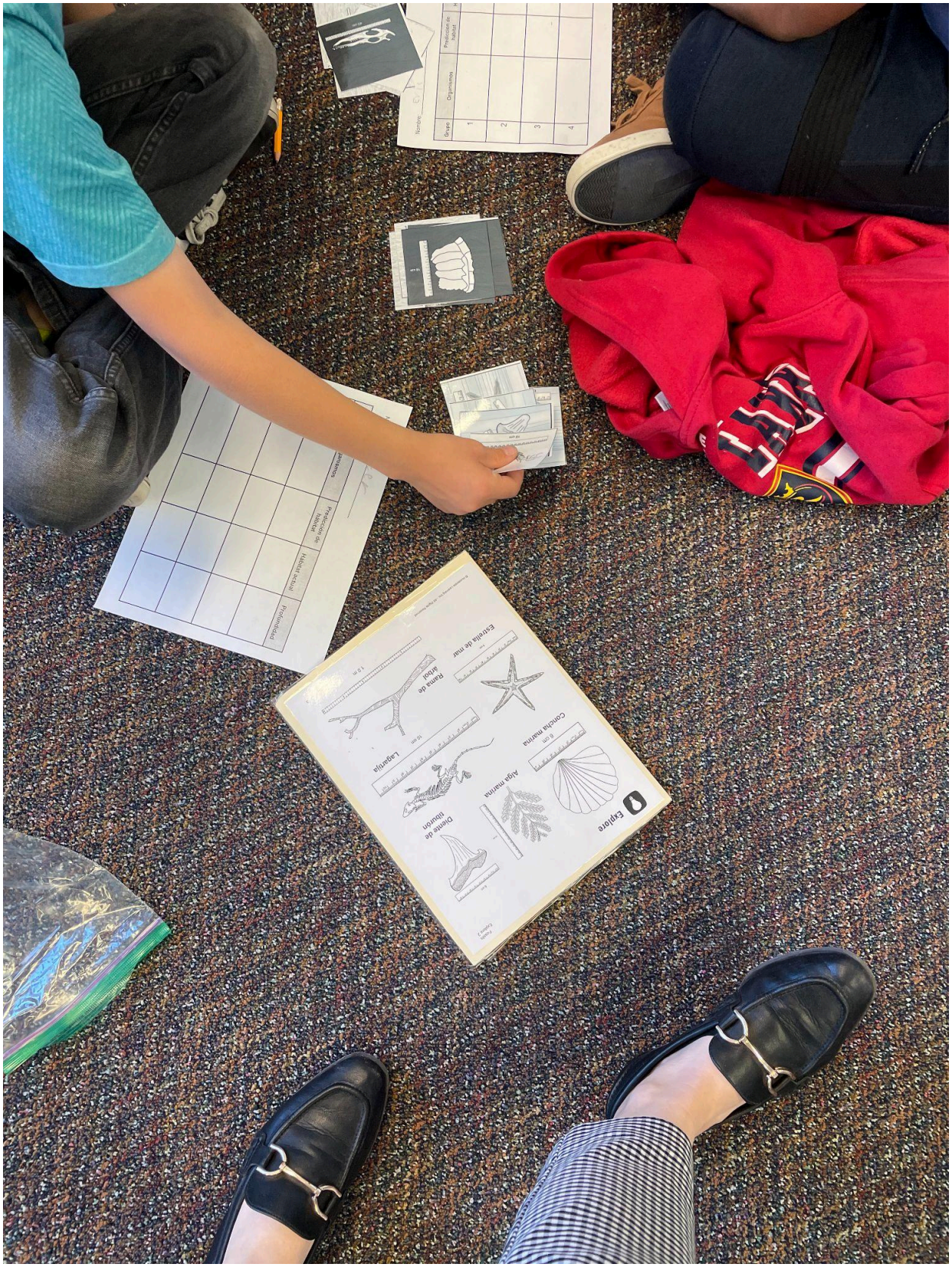
Explore
Estrella de mar
Rama de alcol
Lagartija
Concha marina
Alga marina
Diente de tiburón

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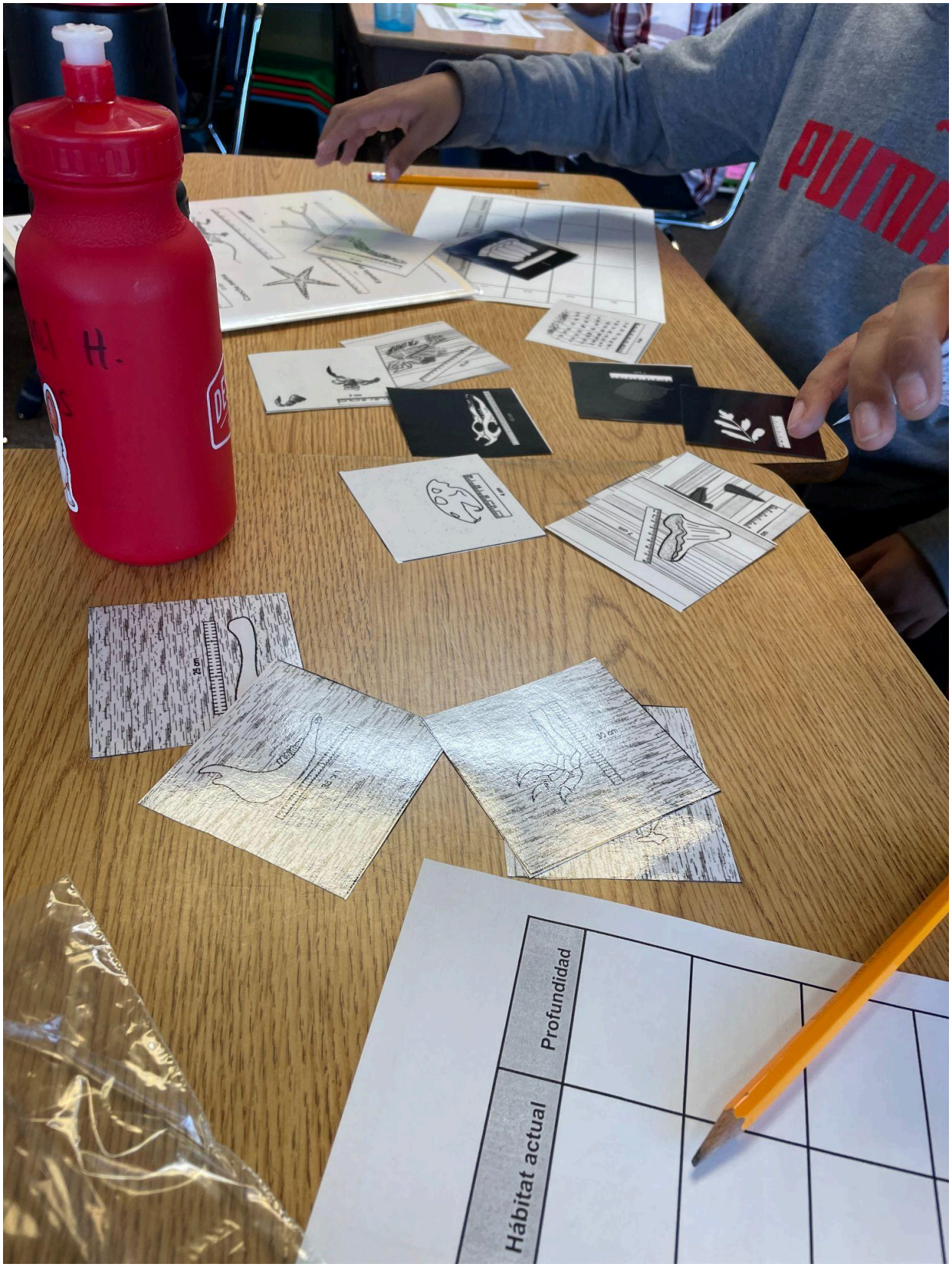

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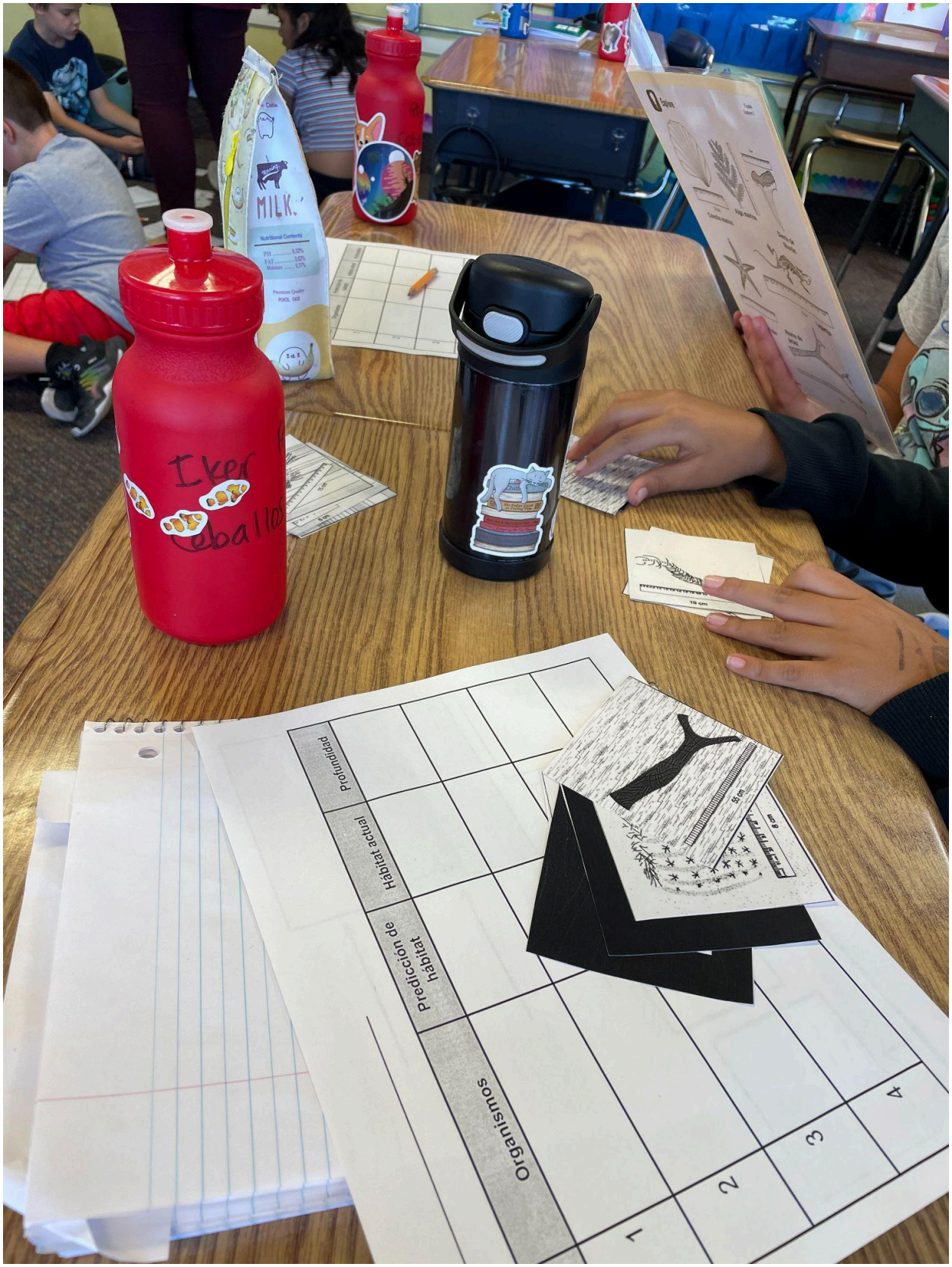
MILK
Iker
Profundidad
Hábitat actual
Predicción de hábitat
Organismos
1
2
3
4

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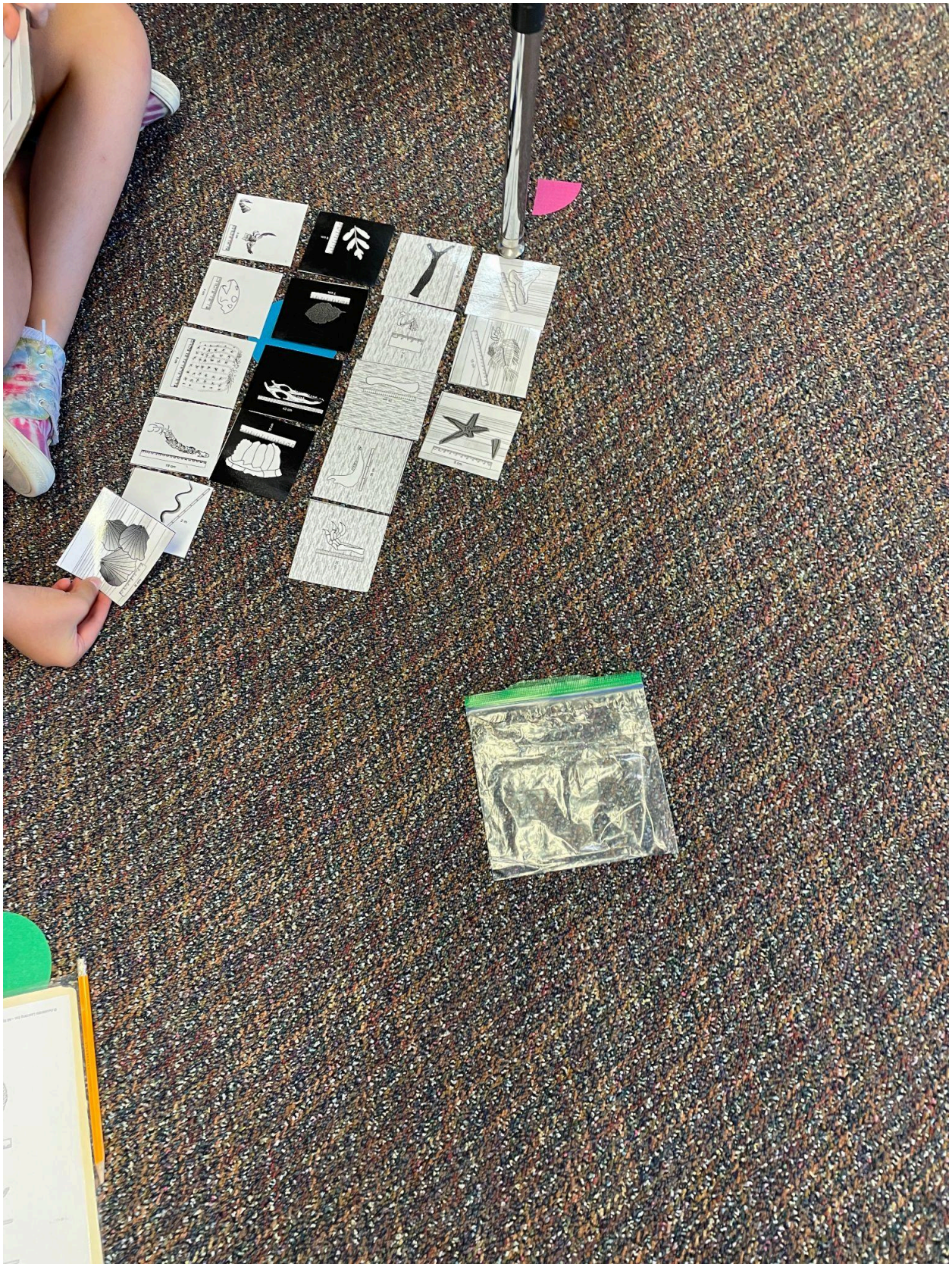

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Explore
Clave de los fósiles: Organismos
Explore
Nombre: VALENTA
Organismos
Protección de hábitat
Hábitat actual
Peculiaridad

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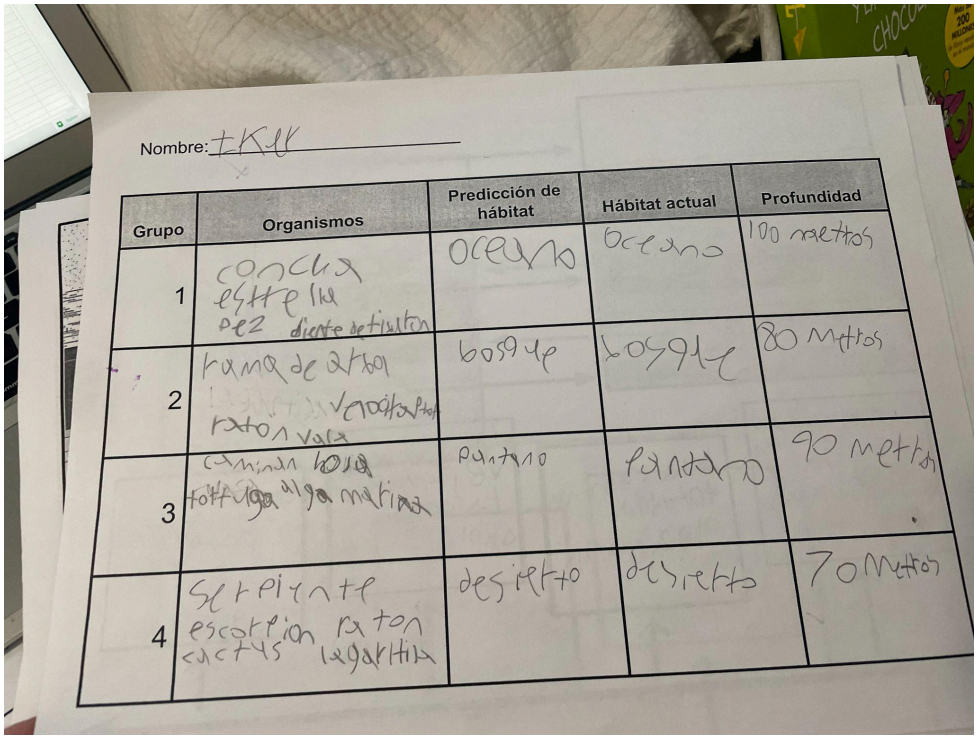
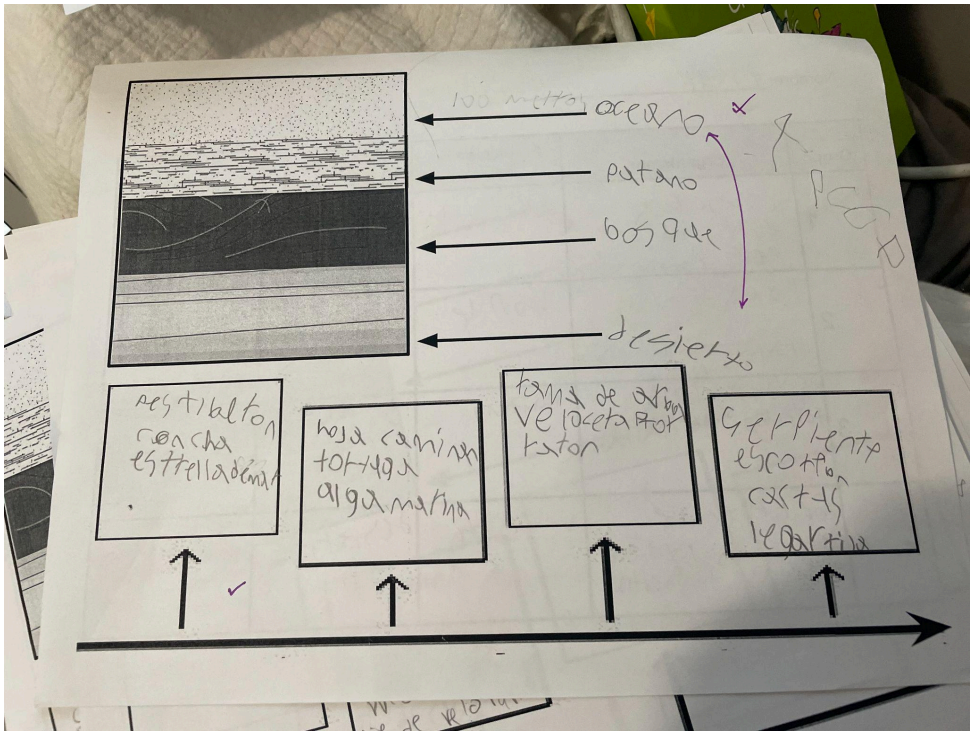


Nombre: [illegible]

Grupo	Organismos	Predicción de hábitat	Hábitat actual	Profundidad
1	concha estrella pez diente de tiburon	oceano	oceano	100 metros
2	rama de arbol [illegible] raton vara	bosque	bosque	80 Metros
3	caminar hoja tortuga alga marina	pantano	pantano	90 metros
4	Serpiente escorpion raton cactus lagartija	desierto	desierto	70 Metros



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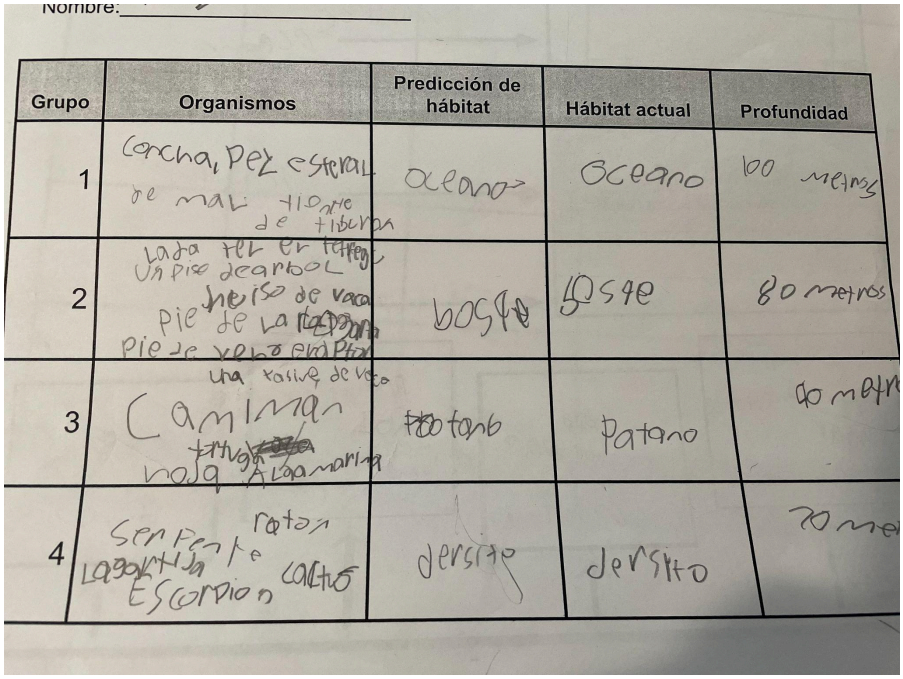
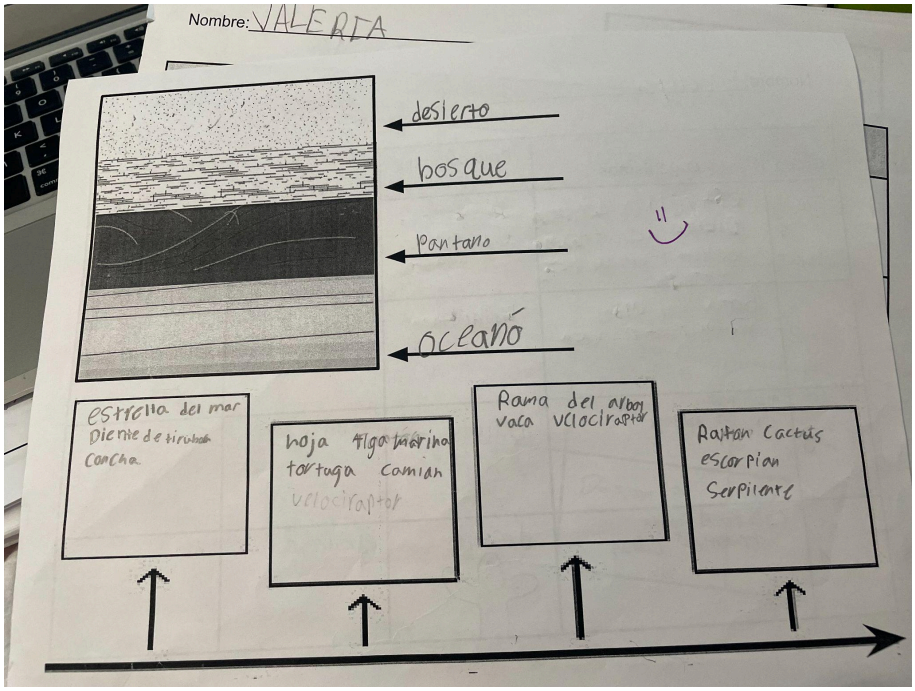


Nombre:

Grupo	Organismos	Predicción de hábitat	Hábitat actual	Profundidad
1	concha, pez estrella de mar, tiburon de tiburon	oceano	oceano	100 metros
2	Un pie de arbol, pie de vaca, pie de la [illegible], pie de vaca	bosque	bosque	80 metros
3	Camiman, una tortuga, hoja, alga marina	pantano	pantano	40 metros
4	serpiente, rata, lagartija, escorpion, cactus	desierto	desierto	20 metros



Nombre: VALERIA

desierto

bosque

pantano

oceano

estrella del mar
Diente de tiburon
concha

hoja alga marina
tortuga camian
velociraptor

Rama del arbol
vaca velociraptor

Raton cactus
escorpian
Serpiente

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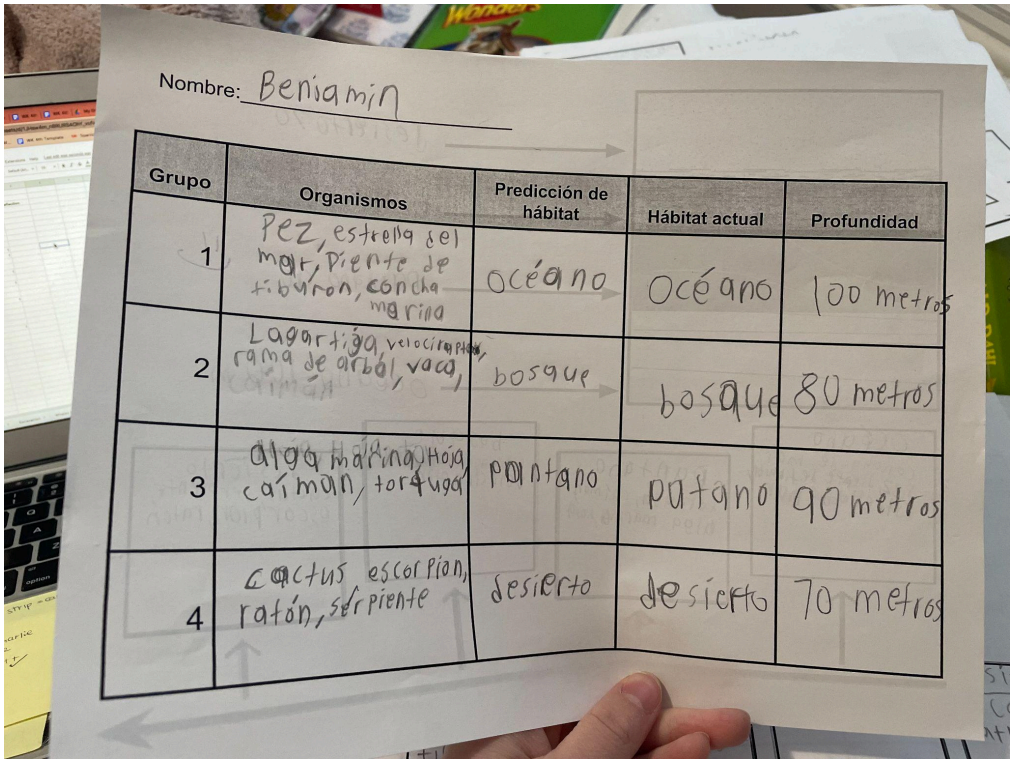
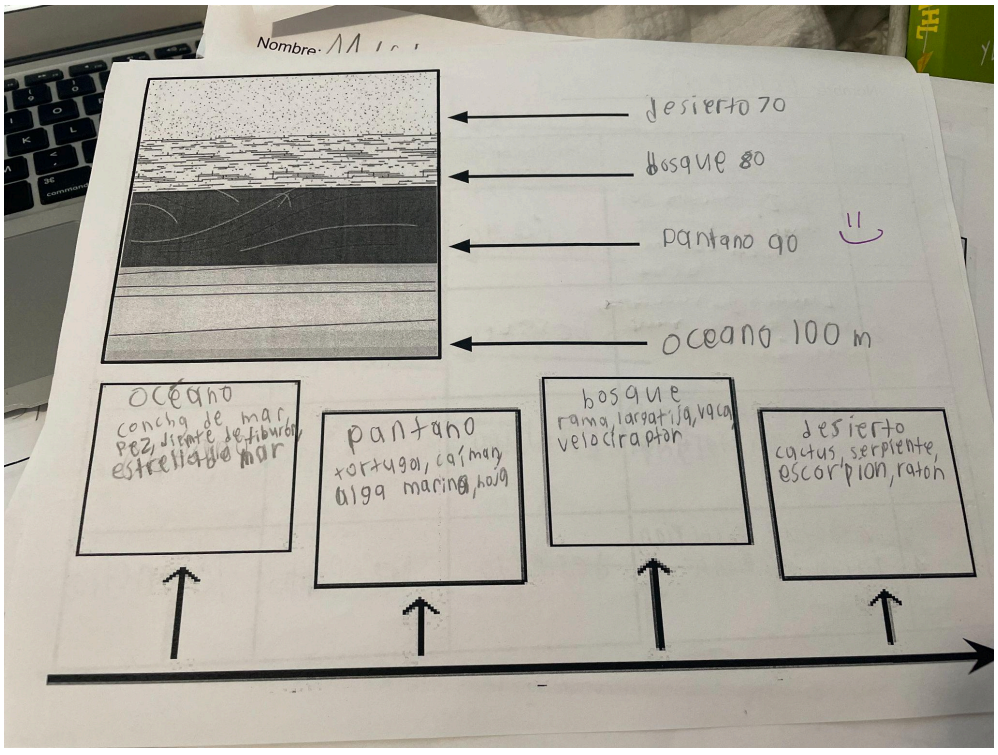


Nombre: Beniamin

Grupo	Organismos	Predicción de hábitat	Hábitat actual	Profundidad
1	Pez, estrella del mar, diente de tiburon, concha marina	océano	Océano	100 metros
2	Lagartija, velociraptor, rama de arbol, vaca,	bosque	bosque	80 metros
3	alga marina, hoja, caiman, tortuga	pantano	pantano	90 metros
4	cactus, escorpion, ratón, serpiente	desierto	desierto	70 metros



Nombre: [illegible]

desierto 70

bosque 80

pantano 90

oceano 100 m

océano
concha de mar, pez, diente de tiburón, estrella de mar

pantano
tortuga, caiman, alga marina, hoja

bosque
rama, largatija, vaca, velociraptor

desierto
cactus, serpiente, escorpion, raton

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Lesson 5: Earth's Landscapes

Date: October 18, 2022

Standard: 4.1.4 Engage in argument from evidence based on patterns in rock layers and fossils found in those layers to support an explanation that environments have changed over time. Emphasize the relationship between fossils and past environments. Examples could include tropical plant fossils found in Arctic areas and rock layers with marine shell fossils found above rock layers with land plant fossils. (ESS1.C)

Objective:

Students will be able to explain that the oldest rock layer can be found at the bottom.

Differentiation:

Brenda, Davlynn, Maurilio, Annalee, and Kensi were all gone last week for our Fossil Dig activity. I want to really listen closely to these five during the lesson to make sure that they are picking up that the oldest layer is on the bottom and the newest layer is on the top. If I am feeling like they, as well as some other students, need a little bit more support, I will either show the whole class the PBS video (linked at the end of the slides). If I feel like it is just these five who need some more help, I will pull those students aside to watch the video and discuss together while other students are doing Amira in Spanish on Wednesday.

Resources:
Slides
Generation Genius Reading
Comic Strips for drawing
Pencils
5 books for groups of 4 students (they can just use their Wonders and Math books)
PBS video

Assessments:

a) **Formative:**
   Class discussions
   First 5 drawings

b) **Summative:**

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Last drawing where students are required to label the oldest and the newest layer in the rock layers.
Labeling of their fossil dig activity (if they weren't here– they can work with a partner and make sure to write their names in pencils on their partners' sheet).

Procedures:

a) **Activating prior knowledge:**
Slides 1 and 2: What are layers? What do you notice about the Grand Canyon?
Slide 3: Put students in groups of 4 (Students in the front and third rows can just turn around to the next rows). Stack of books– Which book was placed first? Which book was placed last.

b) **Guided Practice:**
For each of the five paragraphs in the text, we will:
1) Review new words
2) Read chorally
3) Discuss questions in partners.
4) Discuss ideas as a class
5) Answer the "quiz" questions on their whiteboards with their groups of 4.
6) Draw answers to questions in comic strips.

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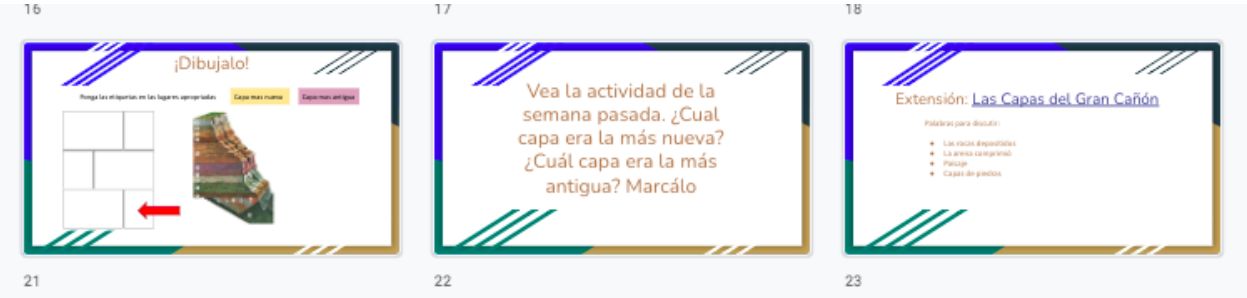

c) **Independent Practice:**
For the final square in the comic strip, students will need to correctly label the oldest and the newest layers in the rock layers of the Grand Canyon out of the 16 layers. I will know they understand the concept when they label the oldest as the bottom layer and the newest as the top layer. Thus, for this question, we will not discuss as partners or a class beforehand.

Closure:

Class discussion: Hand the students their Fossil Dig worksheets back. Which layer would be the oldest and which layer would be the newest? Have them label the oldest and the newest layers on this paper and turn it back in.

Reflection:

One thing that I think went really well was using the books as an object lesson to introduce the layers. This helped the students to understand that the oldest layer was “laid down” first in a more concrete way. I also think asking questions as a group game in between each text section kept the students engaged and helped me to see if they were understanding the text. One thing that I don’t think they really understand is that the Grand Canyon was carved out by a river and that is why we can see all of the layers easily. A video may have helped with this. However, I do not think that this concept is fundamental to their understanding of this unit. I could have also shown more examples of sedimentary rocks as the Grand Canyon is the only example that they are seeing and I want them to understand that sedimentary rocks can be found in other places as well.

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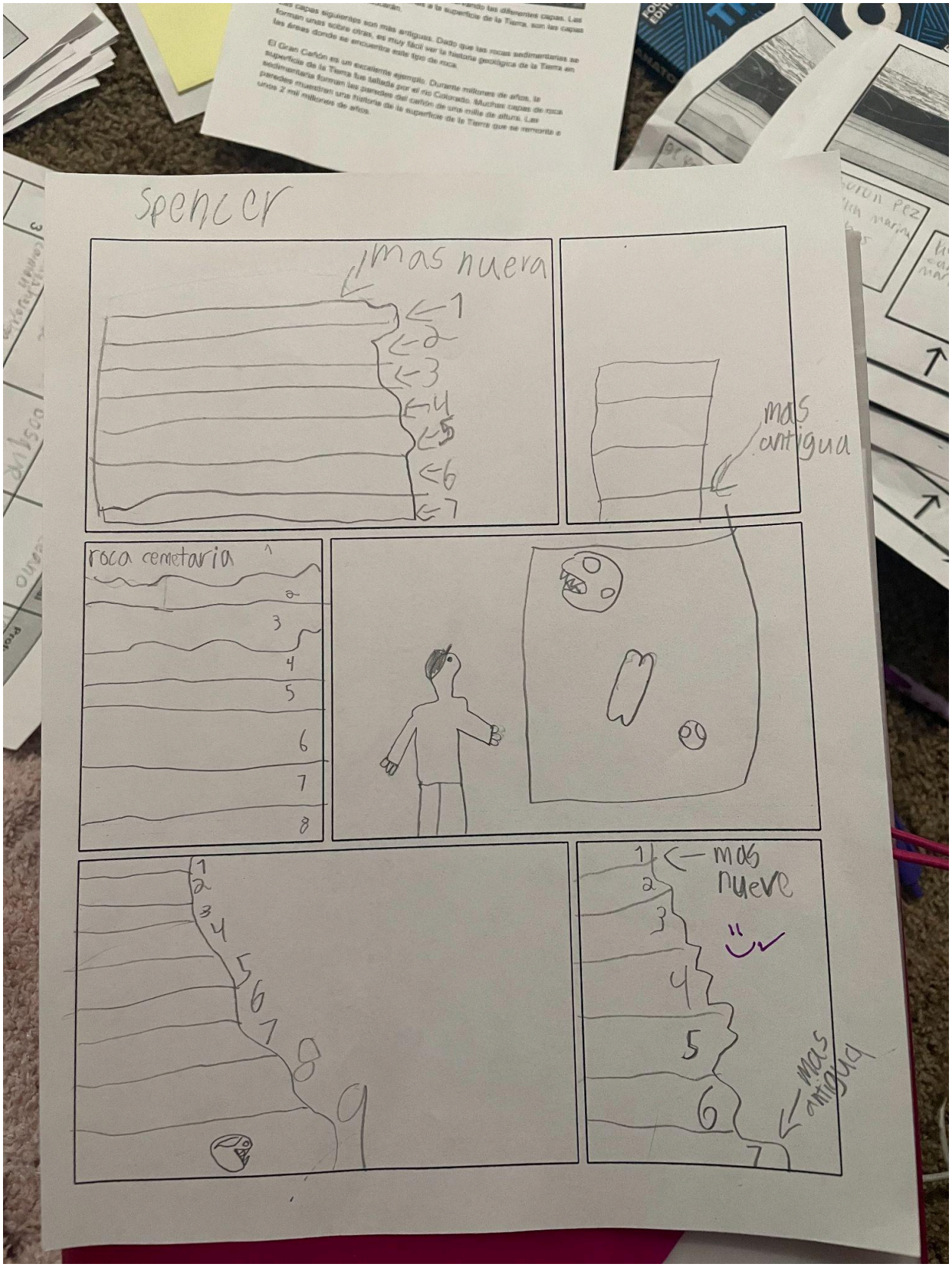
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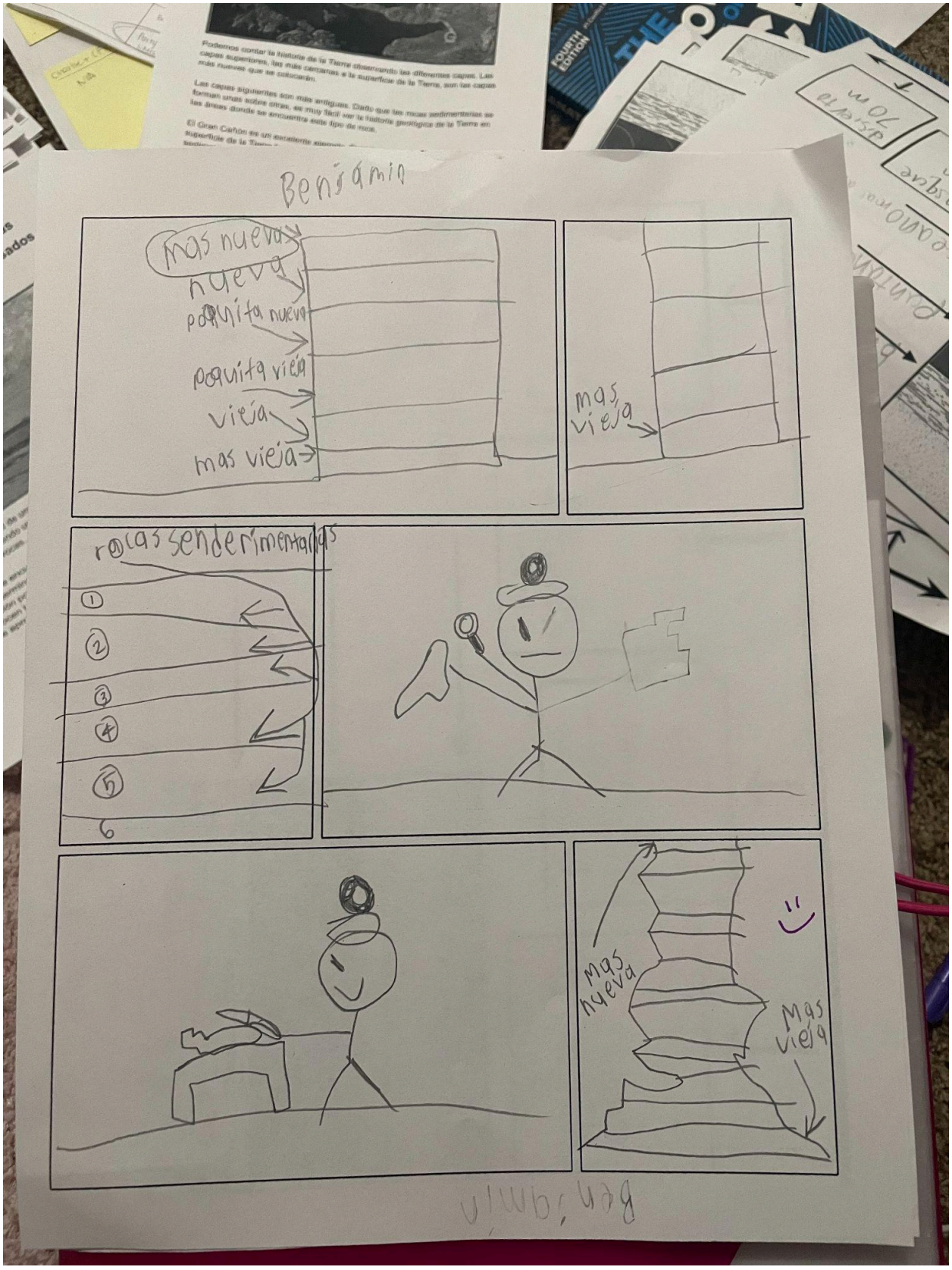
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Mas vieja

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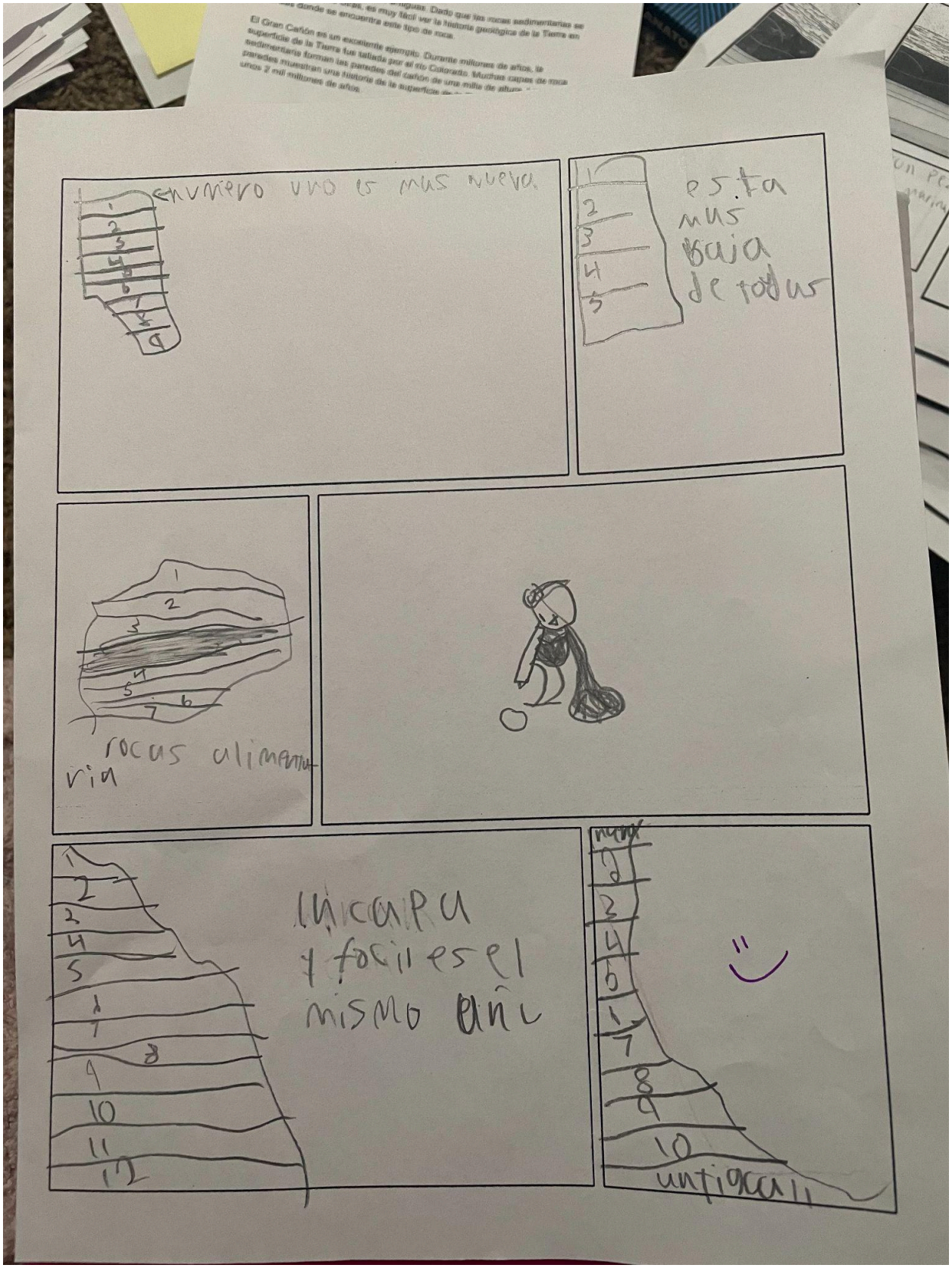
el numero uno es mas nueva
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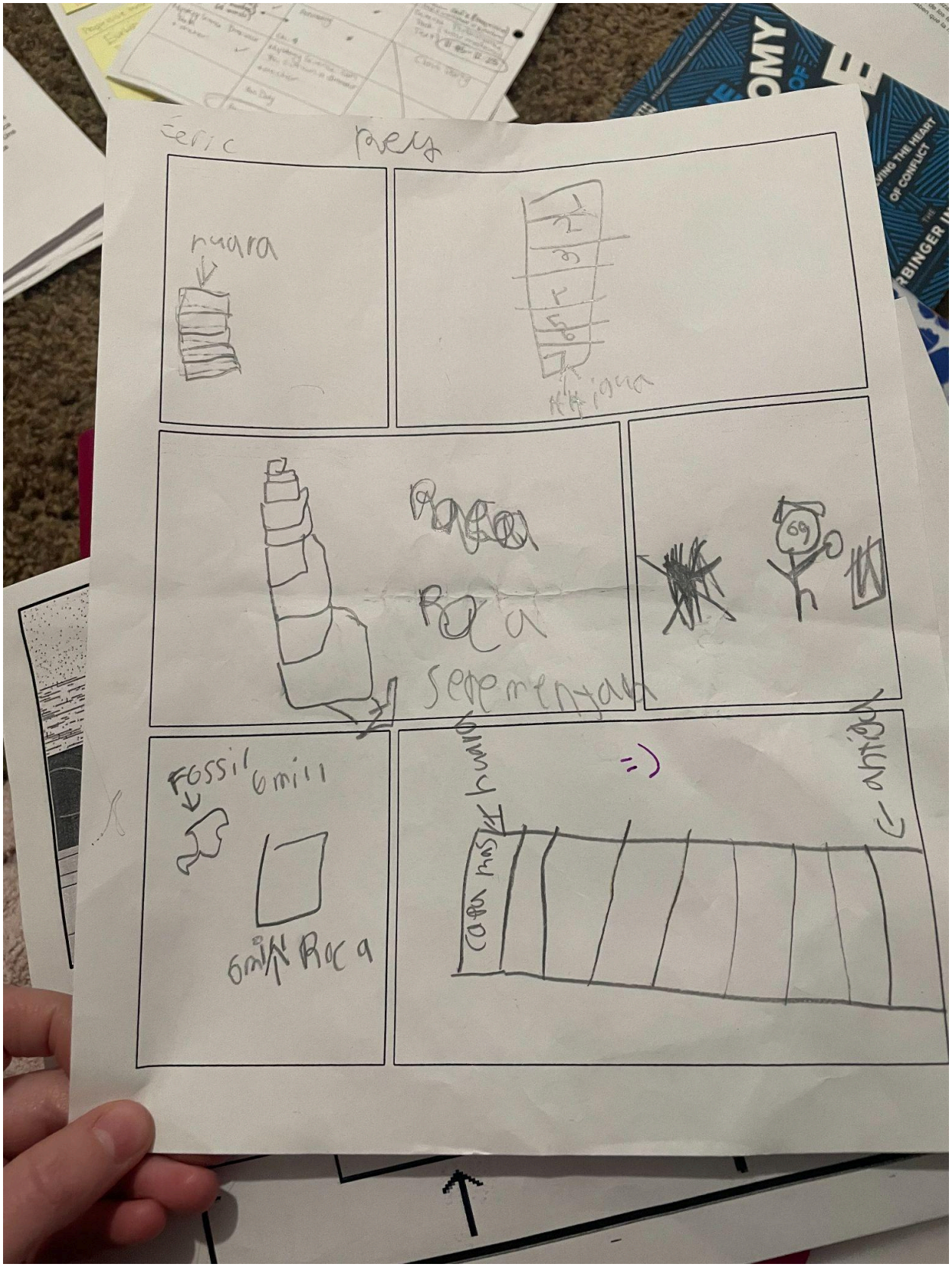

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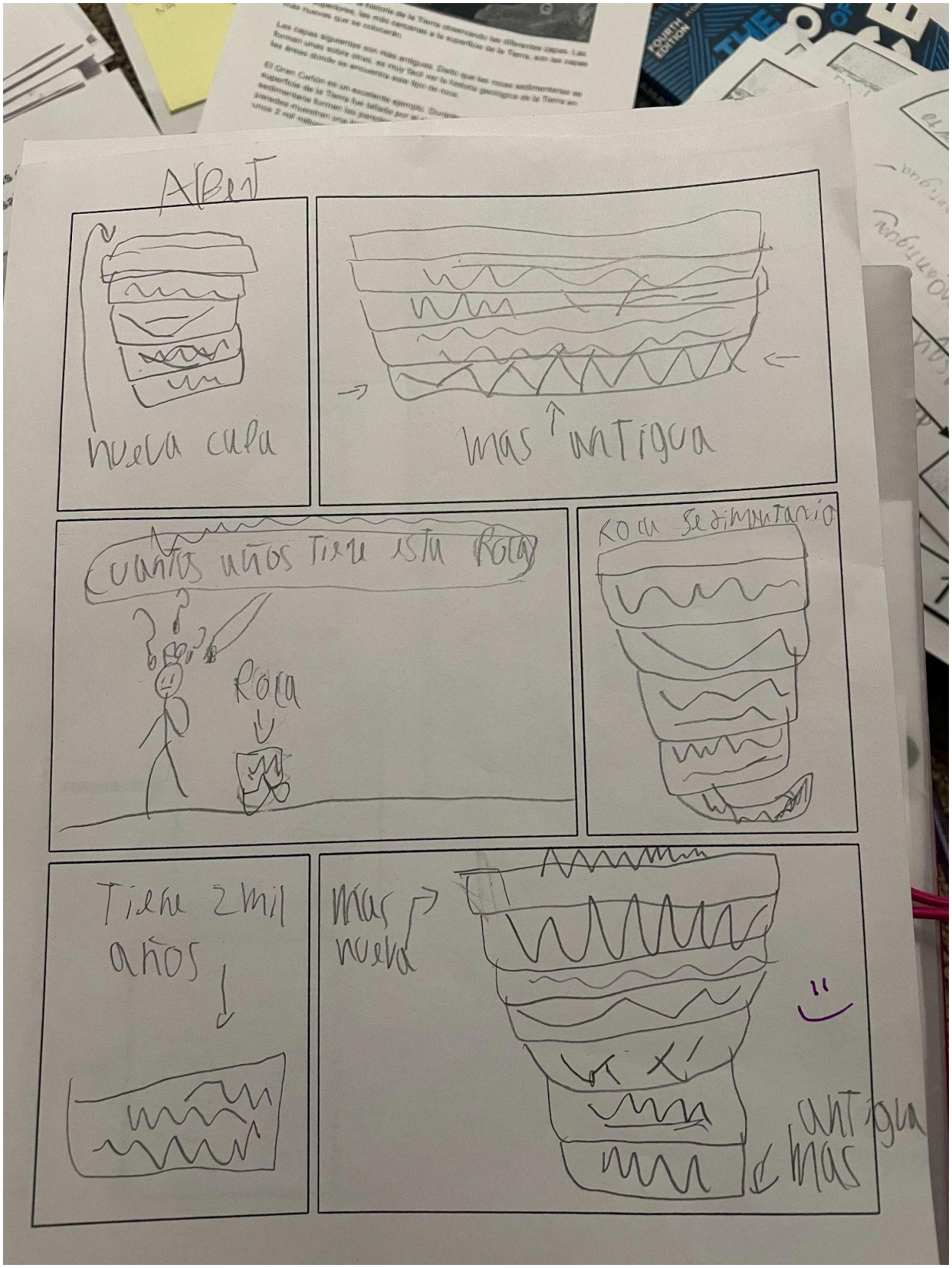
Albert
nueva capa
mas antigua
cuantos años tiene esta Roca
Roca
Roca sedimentario
Tiene 2mil años
mas nueva
mas antigua

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GoReact Video Reflection

Lesson 5: Earth's Landscape Introduction: Video Recording

Interactions:

Something that I have been working on throughout the semester is responding to students' responses in an encouraging way. At first, I felt like it was hard to know how to respond when students were wrong. I did not want to embarrass them but I also wanted to make sure I corrected misconceptions when the moment was right. I asked Mrs. Ceballos her suggestions on this and she suggested asking follow-up questions to help them identify their own mistakes or guide them to the correct answer. I noticed while observing the video that I did do this a couple of times. Thus, I feel that this response is becoming more natural on my part. I also tried to include several different engagement strategies. For example, I showed students several pictures along with a new vocabulary word. I had them discuss with partners what they thought the word meant based on the pictures. Another time, I had students give me a thumbs up if they agreed with what one student had said. I then asked if anyone else had a different idea than that specific student.

One thing that I would like to work on is making sure that all students have the opportunity for success in each lesson. For example, if one part of the lesson I demonstrate something using a stack of books. However, I do not think that all the students can see my stack of books since I am demonstrating on one of the front desks and students at the book cannot see it. There are several things that I could have done differently in order to solve this problem. I could have students come to the carpet and demonstrate where they can all see. I could have also created a video beforehand or used the document camera to show the books. There are a myriad of ways that I could have ensured that each of the students could see my demonstration. Thus, in the future I would like to be more aware that all my students are able to have optimal engagement opportunities in each lesson.

Expectations:

Overall, I think I did a fairly good job demonstrating my expectations for my students. I explained that we would be learning about rock layers. I then had the students give me a thumbs up when they had everything put away and ready. One hiccup that I had here was that I did not explain what the students should be ready for. One student even came up to the front to ask me what she was supposed to be ready for. That being said, I use thumbs up as a signal to show me that they have completed a given task throughout the lesson. For example, I ask students to give me a thumbs up when they have written their name at the top of the paper that I give them.

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Another thing I do is explain that I would like their fingers on the page where we will be reading chorally. This helps me to ensure that students are reading along and engaged. I walk around between rows so that I can see that students are indeed reading along and completing this expectation. When they are not, I silently point to where we are on the page to show that I expect their fingers and eyes to be at that spot as well. One thing that I think that I could have improved on is better stating the objective at the beginning of the lesson. For many of our science lessons, we follow a line of inquiry. However, this lesson was rather straightforward and it would have been helpful for students to know that I expected them to explain the order in which rock layers form.

Procedures:

In this lesson, I see myself backtracking on procedures quite a bit. I do not think that this is necessarily a bad thing– it only signifies that as I am teaching, I become aware of procedures about which students are confused. For example, I tell students that I will be putting them in groups of four, and that in these groups of four they will need five books. Immediately, students start to get their books. I then tell them to wait until I have given further instructions. While I am pleased that I caught this misconception before the class was in too much chaos, I think the lesson would run even more smoothly had I anticipated this confusion beforehand and given instructions at the beginning to stay seated and listening until I had finished giving my instructions.

Behavior:

It is very interesting to observe a lesson from a video that was taken from a different classroom perspective than I normally get. In order to get a broader perspective of the lesson, I placed my phone at the back of the class– a perspective I do not always get. Thus in rewatching my lesson, I was able to see that there was a group of students that were often talking while I was instructing or while other students were speaking. This tells me that students were likely not engaged in the lesson. That being said, I did correct a group of students when they were making their pile of books and told a student to be looking at the front. I was able to correct some behavior and missed others. I think I could have used more positive reinforcement for groups that were engaged in order to help the group that was not engaged to see what my expectations of them were.

Physical Space:

At the beginning of the lesson, I stand at the front of the class most of the time. I do this so that I can quickly move to the next slide. However, as students talk with their partners, I do walk

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around and listen to their discussions. I also walk around as students read chorally so that I can assess who is engaged in the reading. For the entirety of this portion of the lesson, students remained at their desks. I think that this is appropriate for the tasks since I have students working in desk groups and drawing on their papers.

Teacher Role:

This lesson was fairly teacher-centered. I speak while students listen. I do, however, provide a substantial amount of partner talk and class discussion. The only problem with class discussions is that oftentimes when one student is sharing their response, other students are zoning out of the lesson. In the future, I would like to use strategies of having students repeat, rephrase, or respond to what other students are saying in order to create a more collaborative and student-centered environment. I have found that sentence frames are very instrumental in facilitating these kinds of classroom discussions as I have practiced these strategies in other lessons.

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Lesson 6: Dinosaur Teeth

Date: October 19, 2022

Standard 4.1.3 Analyze and interpret data from fossils to provide evidence of the stability and change in organisms and environments from long ago. Emphasize using the structures of fossils to make inferences about ancient organisms. Examples of fossils and environments could include comparing a trilobite with a horseshoe crab in an ocean environment or using a fossil footprint to determine the size of a dinosaur. (LS4.A)

Objective: Students will be able to make assumptions about the organisms and its environment based on the fossil characteristics.

Differentiation:
Kensi and Abraham missed yesterday: Make sure to do a review of what we talked about yesterday.
Tony, Kensi, Maurilio, and Cole: These students get distracted easily and this worksheet has quite a few different steps. Make sure to check with these students on each layer and check that they understand what they should be doing.

Resources:

Mystery Science
Dinosaur Teeth Worksheet
Pencils
Layers Slides (for review game at the end)

Assessments:

a) **Formative:**
   Pair/Share discussions
   Class discussions
b) **Summative:**
   Dinosaur Teeth Worksheet (last page)

Procedures:

a) **Guided Practice:**
   - Mystery Science video.
   - Ask questions throughout (as indicated on sticky notes below)

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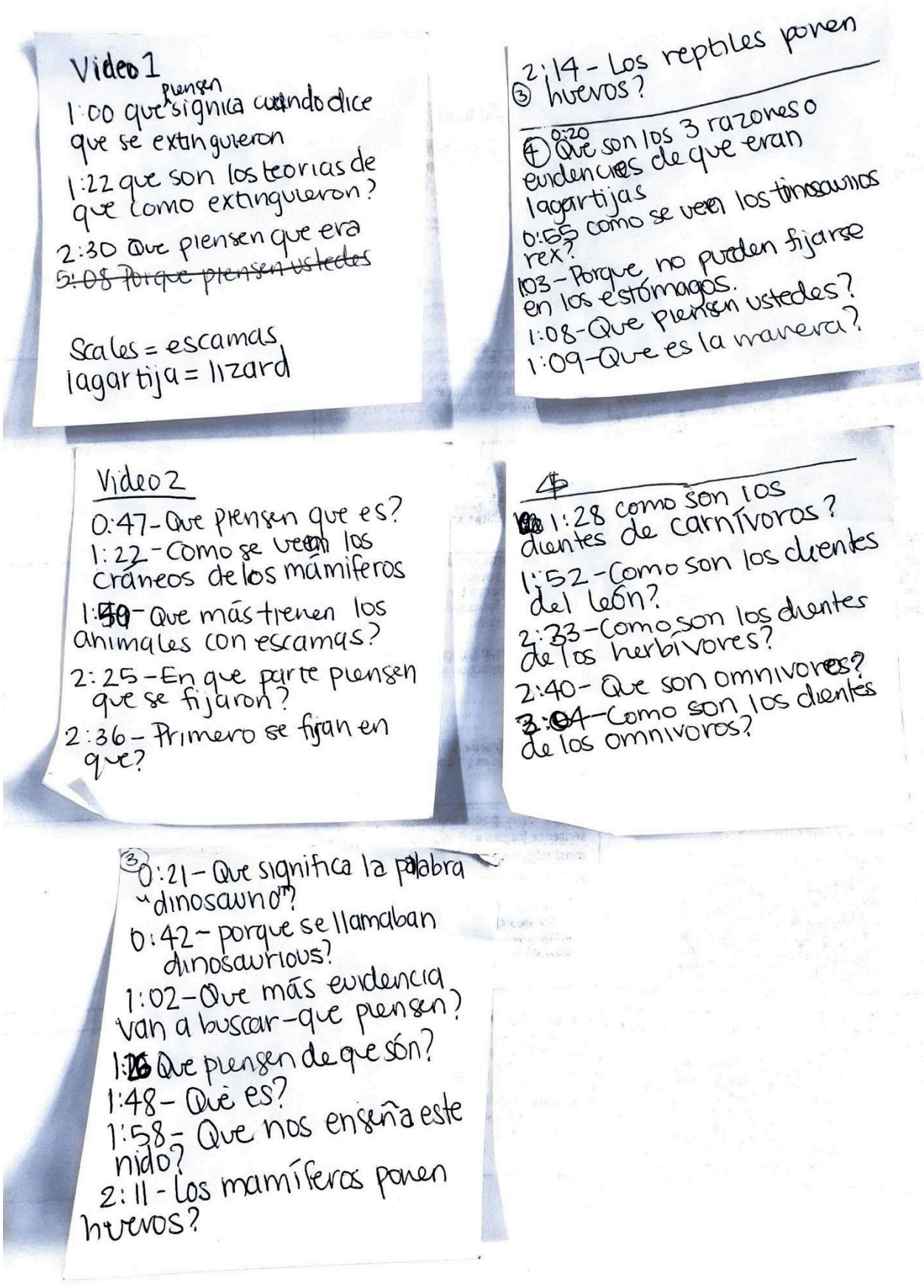

Video 1
1:00 que significa cuando dice que se extinguieron (plensen)
1:22 que son los teorias de que como extingueron?
2:30 Que plensen que era
~~5:08 Porque plensen ustedes~~

Scales = escamas
lagartija = lizard

2:14 - Los reptiles ponen huevos? (3)

(4) 0:20 Que son los 3 razones o evidencies de que eran lagartijas
0:55 como se veen los tinosaurios rex?
1:03 - Porque no pueden fijarse en los estómagos.
1:08 - Que plensen ustedes?
1:09 - Que es la manera?

Video 2
0:47 - Que plensen que es?
1:22 - Como se veen los cráneos de los mámiferos
1:~~50~~ - Que más tienen los animales con escamas?
2:25 - En que parte plensen que se fijaron?
2:36 - Primero se fijan en que?

(4)
1:28 como son los dientes de carnívoros?
1:52 - Como son los dientes del león?
2:33 - Como son los dientes de los herbívores?
2:40 - Que son omnivores?
3:04 - Como son los dientes de los omnivoros?

(3) 0:21 - Que significa la palabra "dinosaurio"?
0:42 - porque se llamaban dinosaurious?
1:02 - Que más evidencia van a buscar - que plensen?
1:~~26~~ Que plensen de que són?
1:48 - Què es?
1:58 - Que nos enseña este nido?
2:11 - Los mamíferos ponen huevos?

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b) Independent Practice:

Each student will be given a worksheet (linked above). Students will be given the chance to practice identifying whether a dinosaur is a carnivore, herbivore, or omnivore based on its teeth.

Closure:

Group game: Students will be split into groups of 4. They will have to write the answer to the following questions on a whiteboard in under 30 seconds in order to get a point. This is to review the knowledge that we learned today.

1) What evidence do we have that supports the idea that dinosaurs looked like lizards?
2) What are the three types of dinosaurs based on what they eat?
3) What do herbivore teeth look like?
4) What do carnivore teeth look like?
5) What do omnivore teeth look like?
6) What kind of evidence can we look for to know what kind of animal a fossil is?

Reflection:

I think the students really enjoyed investigating the dinosaur teeth. The practice questions in the slides and in the worksheets allowed them to practice on their own and overall they did a good job looking at the different characteristics of the skulls. One thing that was disappointing was that we didn't have time for the review game at the end which I think would have been helpful. I think next time I would improve my pacing by cutting down the pair share times by a little bit. I think I gave students a little too much time to talk at times.

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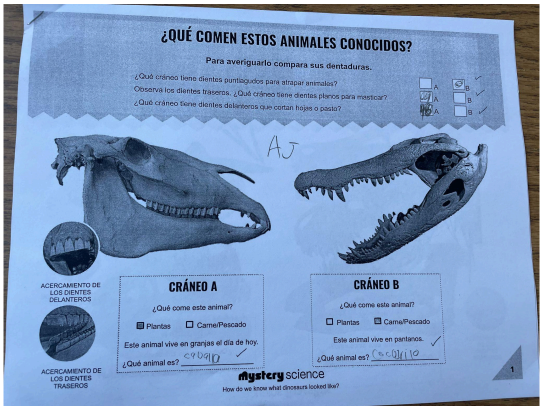
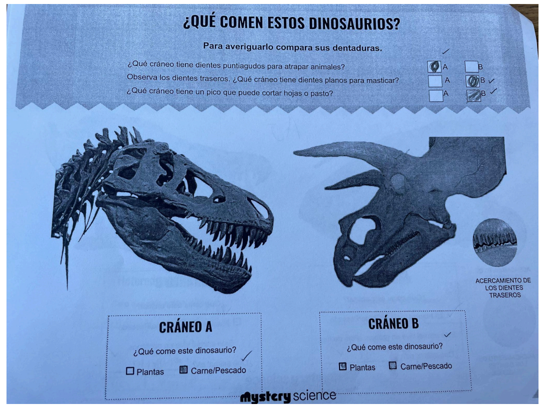
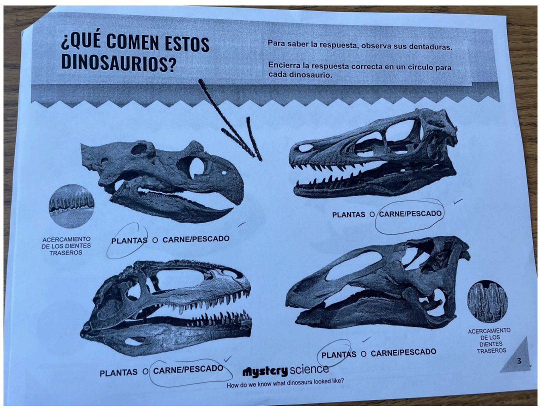
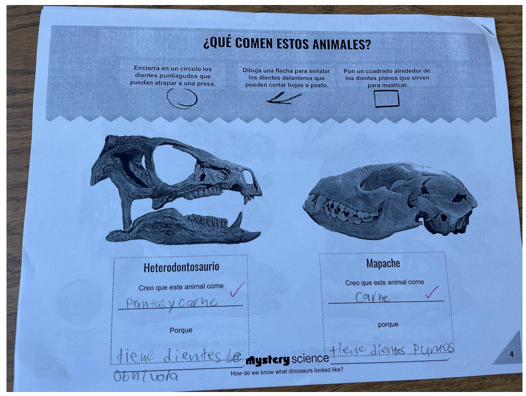
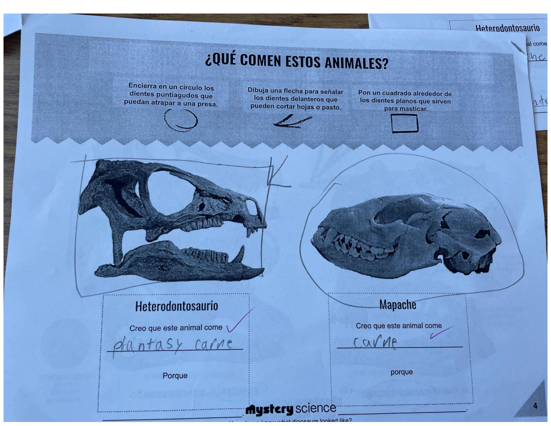
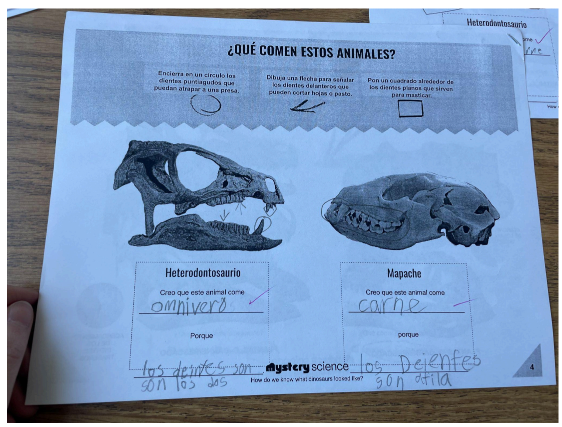

¿QUÉ COMEN ESTOS ANIMALES CONOCIDOS?
Para averiguarlo compara sus dentaduras.
CRÁNEO A
CRÁNEO B

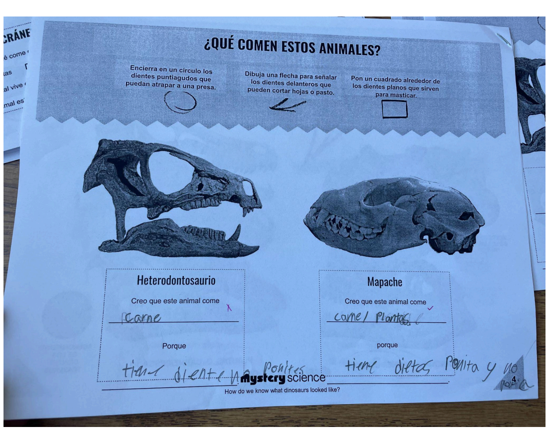

¿QUÉ COMEN ESTOS DINOSAURIOS?
Para averiguarlo compara sus dentaduras.
CRÁNEO A
CRÁNEO B

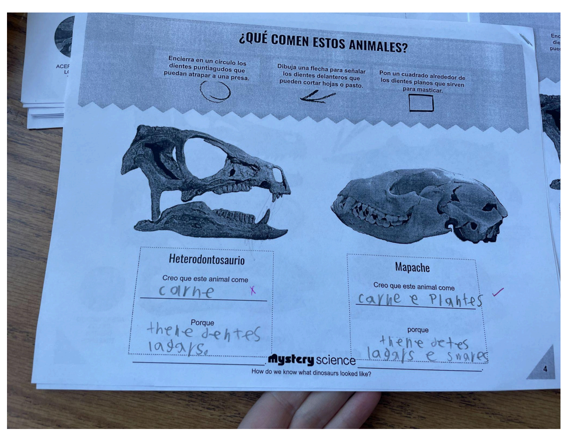

¿QUÉ COMEN ESTOS DINOSAURIOS?
Para saber la respuesta, observa sus dentaduras.
Encierra la respuesta correcta en un círculo para cada dinosaurio.


¿QUÉ COMEN ESTOS ANIMALES?
Heterodontosaurio
Mapache


¿QUÉ COMEN ESTOS ANIMALES?
Heterodontosaurio
Mapache


¿QUÉ COMEN ESTOS ANIMALES?
Heterodontosaurio
Mapache


¿QUÉ COMEN ESTOS ANIMALES?
Heterodontosaurio
Mapache


¿QUÉ COMEN ESTOS ANIMALES?
Heterodontosaurio
Mapache

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Lesson 7: Watery Cave Tour Guide

Date: October 20, 2022

Standard 4.1.3 Analyze and interpret data from fossils to provide evidence of the stability and change in organisms and environments from long ago. Emphasize using the structures of fossils to make inferences about ancient organisms. Examples of fossils and environments could include comparing a trilobite with a horseshoe crab in an ocean environment or using a fossil footprint to determine the size of a dinosaur. (LS4.A)

Objective:

Students will be able to argue the change in environment over time in a watery cave.

Differentiation:

Kensi and Iker: These two students have missed almost this entire unit. Make sure to check with them while they are doing the writing tasks and see if they are confused and need any extra support.

Resources:

Mystery Science Lesson 3: Can You Outrun a Dinosaur (just the lesson part)
Anchor Connection
Performance Task
Footprints in Sand Video

Assessments:

a) **Formative:**
   Discussions with class
   Pair/Share
b) **Summative:**
   Writing: Tour Guide

Procedures:

a) **Activating prior knowledge:**
   What kinds of things can we learn about a fossil based on its skull (review from yesterday)?

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Today we are going to talk about what we can learn based on the footprint fossils that we find.

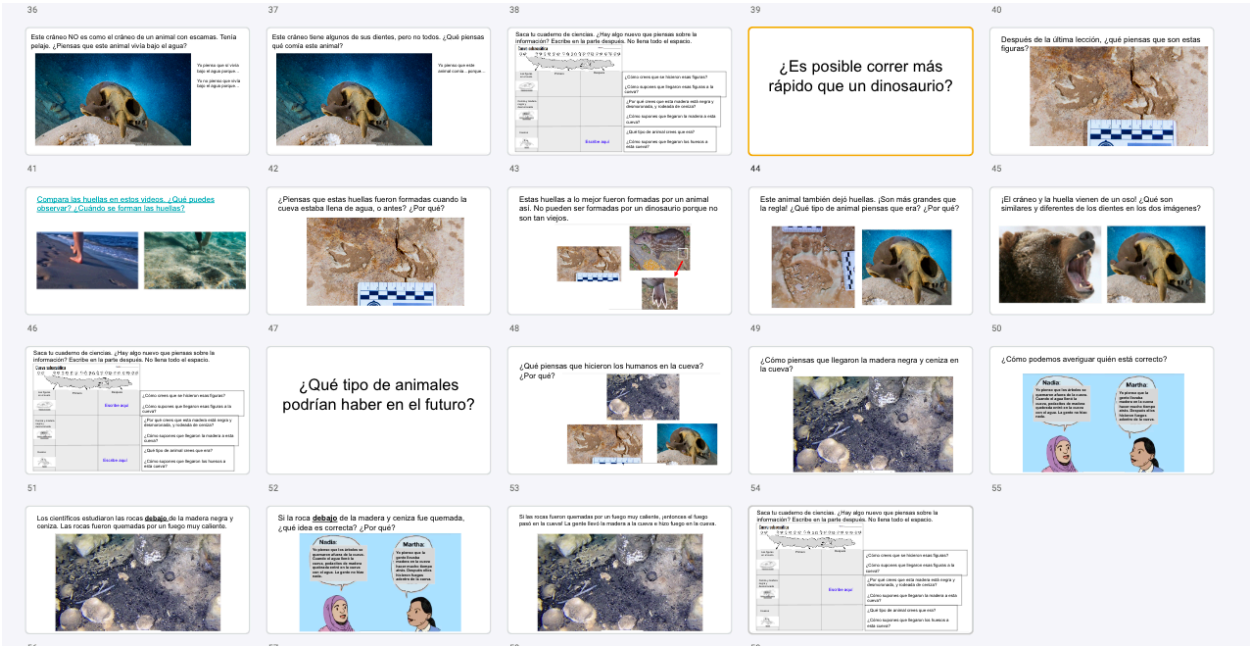
b) Guided Practice:

- Mystery Science video.
- Ask questions throughout:

Video 1:
0:25 ¿Qué son los herbívoros y carnívoros otra vez?
0:38: Piensen que es posible correr más rápido que un dinosaurio?
1:24 Que piensen que son?
2:28: Que piensen que nos dicen sobre los dinosaurios huellas?

Video 2:
1:00 Piensen que hay manera de saber que tan rápido corrieron los dinosaurios?
2:08 Que observan?
2:57 Que observan de los huellas del avestruz?

- Anchor Connection:



- Go through each slide and read chorally.
  After slide 41, watch the video of footprints in the sand getting washed away.
  Ask what students notice.
  Can footprints stay in mud or sand once the water has come?

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What does this tell us about the footprints that were found in the watery cave? Could they have been formed when there was water?

- Observe the picture of the ashes.
  Read the conversation between Nadia and Martha?
  What do students notice about the rocks?
  Pair/Share: Who is correct?
  What do the black rocks tell us about the cave? Can a fire happen when there was water?

c) Independent Practice:

- Give each student a copy of the "Watery Cave Tour Guide" performance task page. Explain that they will be pretending to give a tour of the cave and explaining the evidence that we have of how the cave has changed.
- Review the three pieces of evidence: the footprints, the bones, and the ashes. What do we now know about each of these pieces of evidence? What do they teach us?
- Give students about 20 minutes to answer the questions on the sheet.

Closure:

Class discussion: How did the cave change over time?

Reflection:

If I am being honest, this lesson felt a little messy. I think in the future I would cut out the mystery science about how fast the dinosaur runs. It really was not relevant or helpful to everything else we discussed today. I would just go straight into the anchor phenomenon and spend more time discussing what we have now learned about the cave since many students have been gone for at least one of the times that we have built on this phenomenon and also we have not talked about it in a few days so some students may have forgotten. Some students were confused once we got to the writing tasks so I feel that had I spent more time reviewing that could have helped them immensely! This teaching opportunity definitely taught me some lessons!

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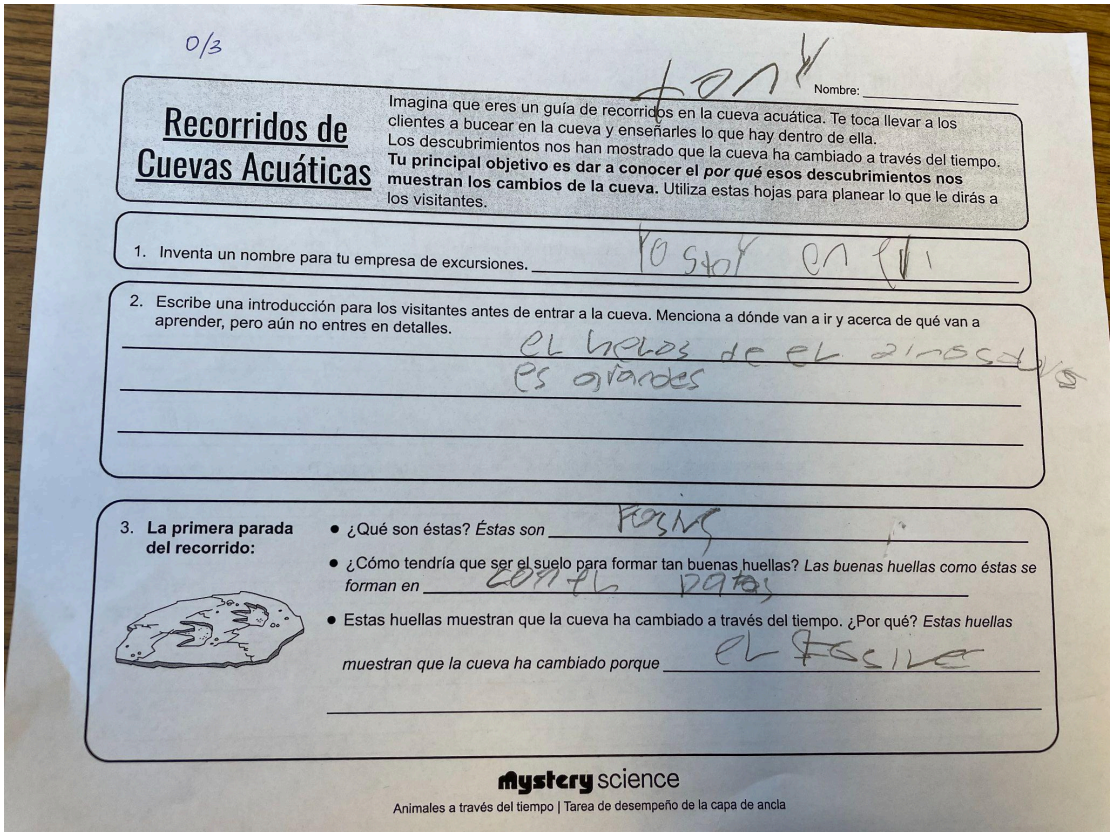


0/3

Nombre: Tony

Recorridos de Cuevas Acuáticas

Imagina que eres un guía de recorridos en la cueva acuática. Te toca llevar a los clientes a bucear en la cueva y enseñarles lo que hay dentro de ella. Los descubrimientos nos han mostrado que la cueva ha cambiado a través del tiempo. **Tu principal objetivo es dar a conocer el *por qué* esos descubrimientos nos muestran los cambios de la cueva.** Utiliza estas hojas para planear lo que le dirás a los visitantes.

1. Inventa un nombre para tu empresa de excursiones. Yo soy en el

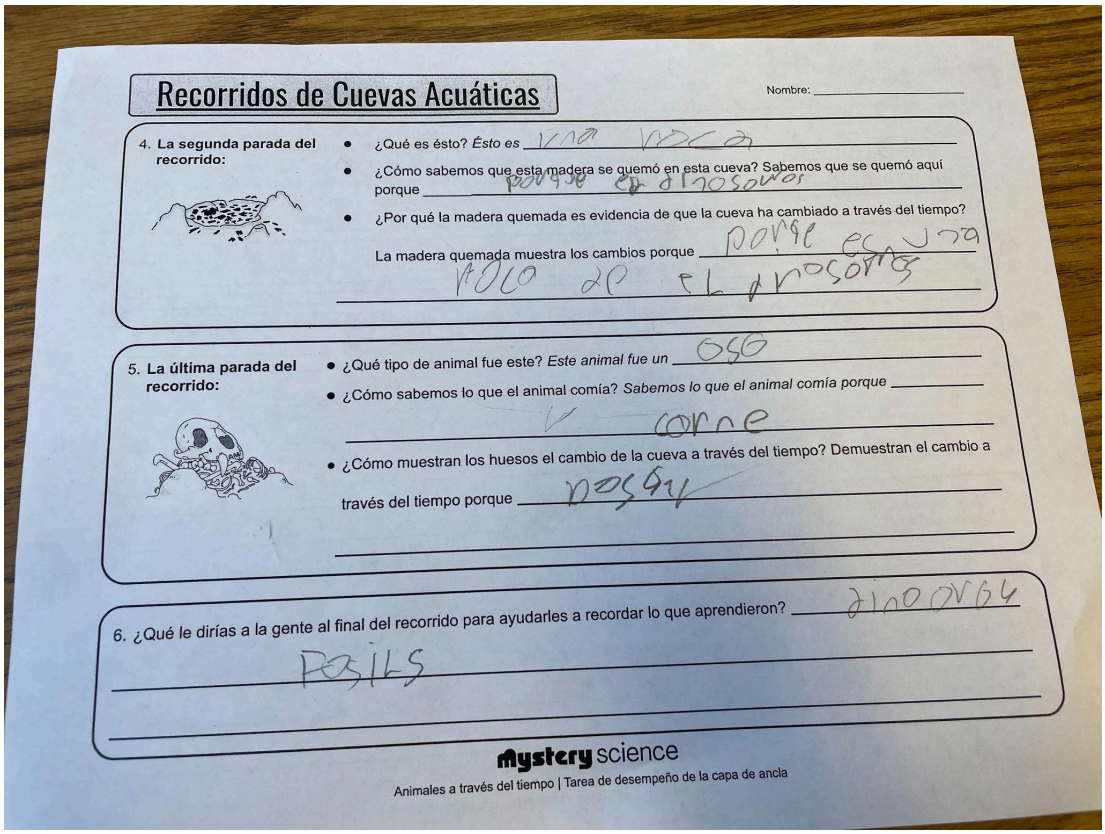
2. Escribe una introducción para los visitantes antes de entrar a la cueva. Menciona a dónde van a ir y acerca de qué van a aprender, pero aún no entres en detalles.
el huesos de el dinosaurios es grandes

3. **La primera parada del recorrido:**

- ¿Qué son éstas? *Éstas son* Fosils
- ¿Cómo tendría que ser el suelo para formar tan buenas huellas? *Las buenas huellas como éstas se forman en* con el patas
- Estas huellas muestran que la cueva ha cambiado a través del tiempo. ¿Por qué? *Estas huellas muestran que la cueva ha cambiado porque* el fosile

Mystery science

Animales a través del tiempo | Tarea de desempeño de la capa de ancla



Recorridos de Cuevas Acuáticas

Nombre:

4. **La segunda parada del recorrido:**

- ¿Qué es ésto? *Ésto es* una roca
- ¿Cómo sabemos que esta madera se quemó en esta cueva? Sabemos que se quemó aquí porque porque de dinosaurs
- ¿Por qué la madera quemada es evidencia de que la cueva ha cambiado a través del tiempo? La madera quemada muestra los cambios porque porque es una todo de el dinosaurs

5. **La última parada del recorrido:**

- ¿Qué tipo de animal fue este? *Este animal fue un* oso
- ¿Cómo sabemos lo que el animal comía? *Sabemos lo que el animal comía porque* corne
- ¿Cómo muestran los huesos el cambio de la cueva a través del tiempo? Demuestran el cambio a través del tiempo porque dosay

6. ¿Qué le dirías a la gente al final del recorrido para ayudarles a recordar lo que aprendieron? dinosaur
Fosils

Mystery science

Animales a través del tiempo | Tarea de desempeño de la capa de ancla

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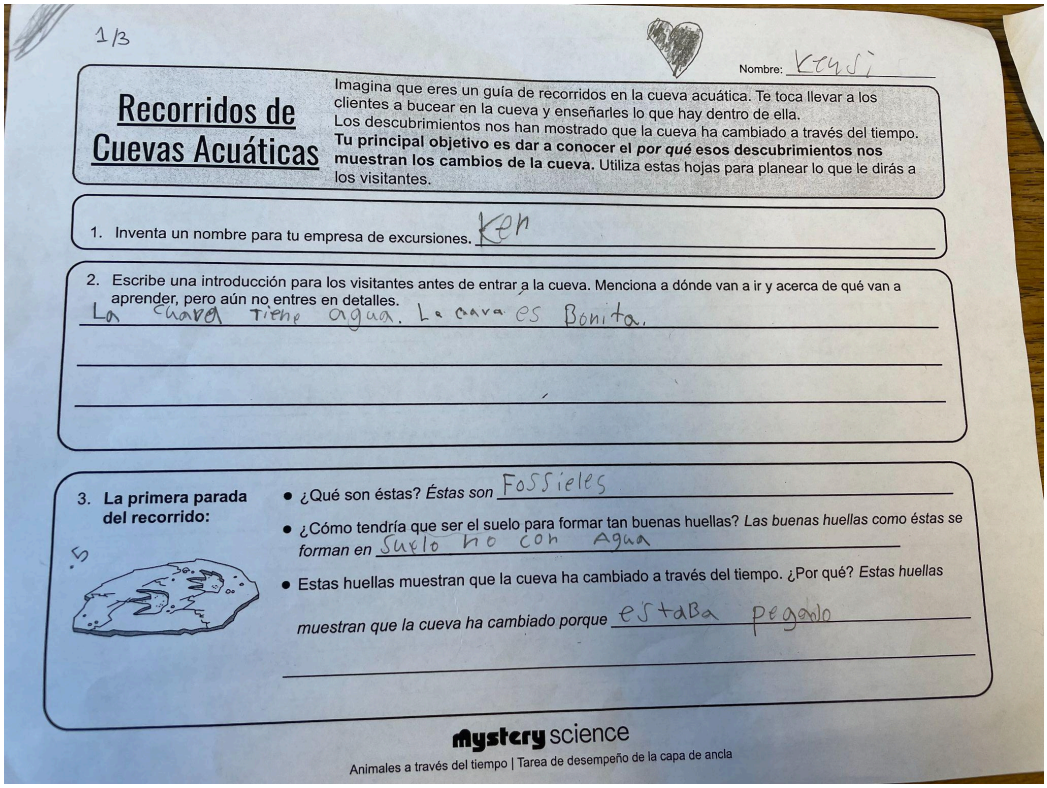

1/3

Nombre: Kensi

Recorridos de Cuevas Acuáticas

Imagina que eres un guía de recorridos en la cueva acuática. Te toca llevar a los clientes a bucear en la cueva y enseñarles lo que hay dentro de ella. Los descubrimientos nos han mostrado que la cueva ha cambiado a través del tiempo. **Tu principal objetivo es dar a conocer el *por qué* esos descubrimientos nos muestran los cambios de la cueva.** Utiliza estas hojas para planear lo que le dirás a los visitantes.

1. Inventa un nombre para tu empresa de excursiones. Ken

2. Escribe una introducción para los visitantes antes de entrar a la cueva. Menciona a dónde van a ir y acerca de qué van a aprender, pero aún no entres en detalles.
La cueva tiene agua. La cueva es Bonita.

3. **La primera parada del recorrido:**

- ¿Qué son éstas? *Éstas son* Fossieles
- ¿Cómo tendría que ser el suelo para formar tan buenas huellas? *Las buenas huellas como éstas se forman en* Suelo no con Agua
- Estas huellas muestran que la cueva ha cambiado a través del tiempo. ¿Por qué? *Estas huellas muestran que la cueva ha cambiado porque* estaba pegado

mystery science
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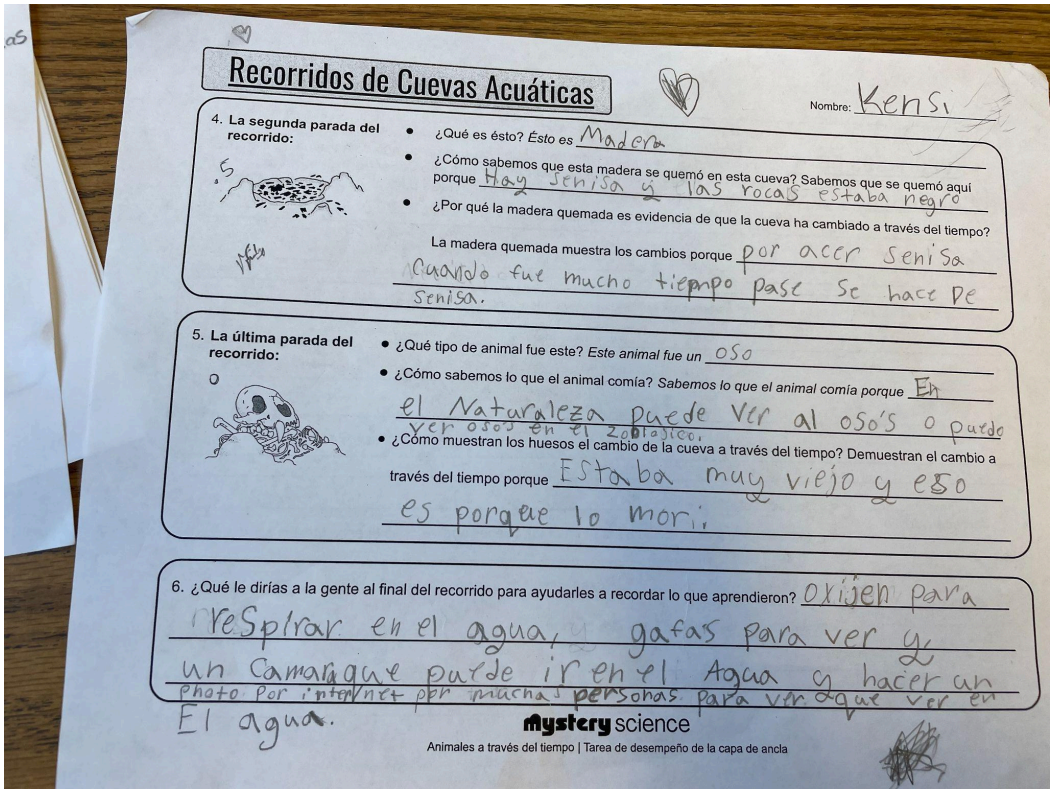

Recorridos de Cuevas Acuáticas

Nombre: Kensi

4. **La segunda parada del recorrido:**

- ¿Qué es ésto? *Ésto es* Madera
- ¿Cómo sabemos que esta madera se quemó en esta cueva? Sabemos que se quemó aquí porque Hay senisa y las rocas estaba negro
- ¿Por qué la madera quemada es evidencia de que la cueva ha cambiado a través del tiempo?

La madera quemada muestra los cambios porque por acer senisa Cuando fue mucho tiempo pase se hace de senisa.

5. **La última parada del recorrido:**

- ¿Qué tipo de animal fue este? *Este animal fue un* oso
- ¿Cómo sabemos lo que el animal comía? *Sabemos lo que el animal comía porque* En el Naturaleza puede ver al oso's o puede ver osos en el zoológico.
- ¿Cómo muestran los huesos el cambio de la cueva a través del tiempo? Demuestran el cambio a través del tiempo porque Estaba muy viejo y eso es porque lo mori.

6. ¿Qué le dirías a la gente al final del recorrido para ayudarles a recordar lo que aprendieron? Oxijen para respirar en el agua, gafas para ver y un camarague puede ir en el Agua y hacer un photo. Por internet por muchas personas para ver que ver en El agua.

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Animales a través del tiempo | Tarea de desempeño de la capa de ancla

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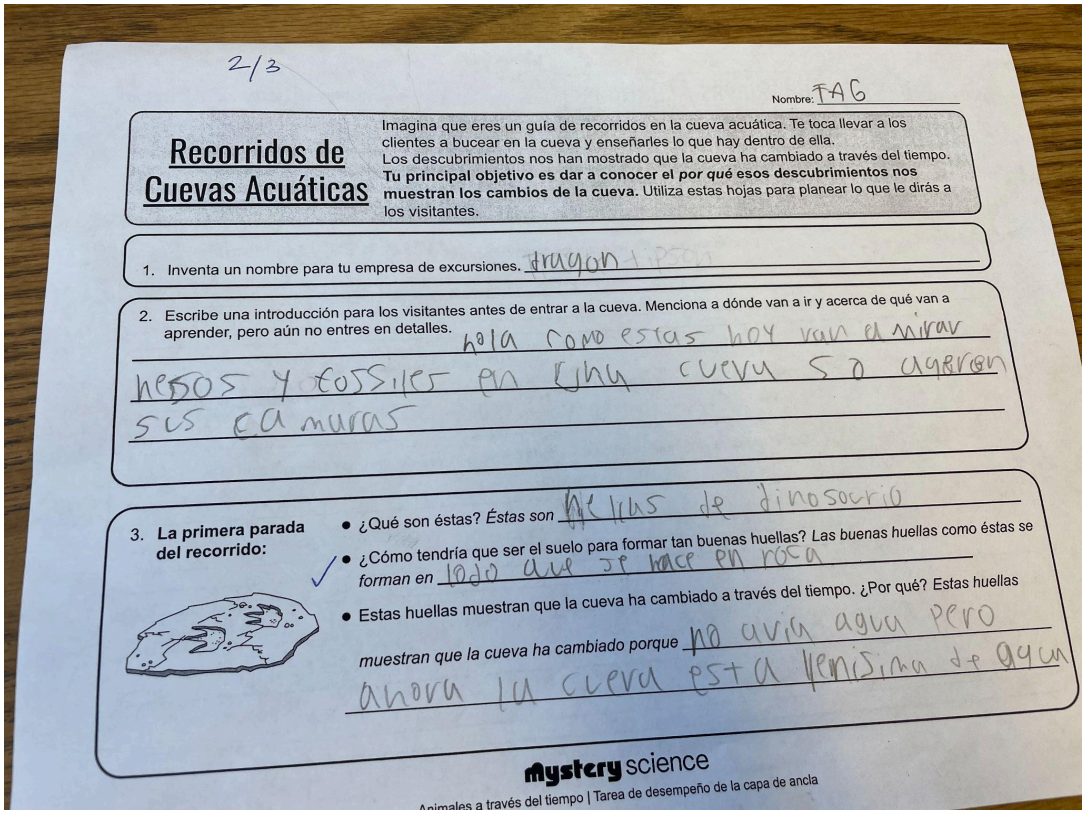


2/3

Nombre: FAG

Recorridos de Cuevas Acuáticas

Imagina que eres un guía de recorridos en la cueva acuática. Te toca llevar a los clientes a bucear en la cueva y enseñarles lo que hay dentro de ella. Los descubrimientos nos han mostrado que la cueva ha cambiado a través del tiempo. **Tu principal objetivo es dar a conocer el *por qué* esos descubrimientos nos muestran los cambios de la cueva.** Utiliza estas hojas para planear lo que le dirás a los visitantes.

1. Inventa un nombre para tu empresa de excursiones. dragon

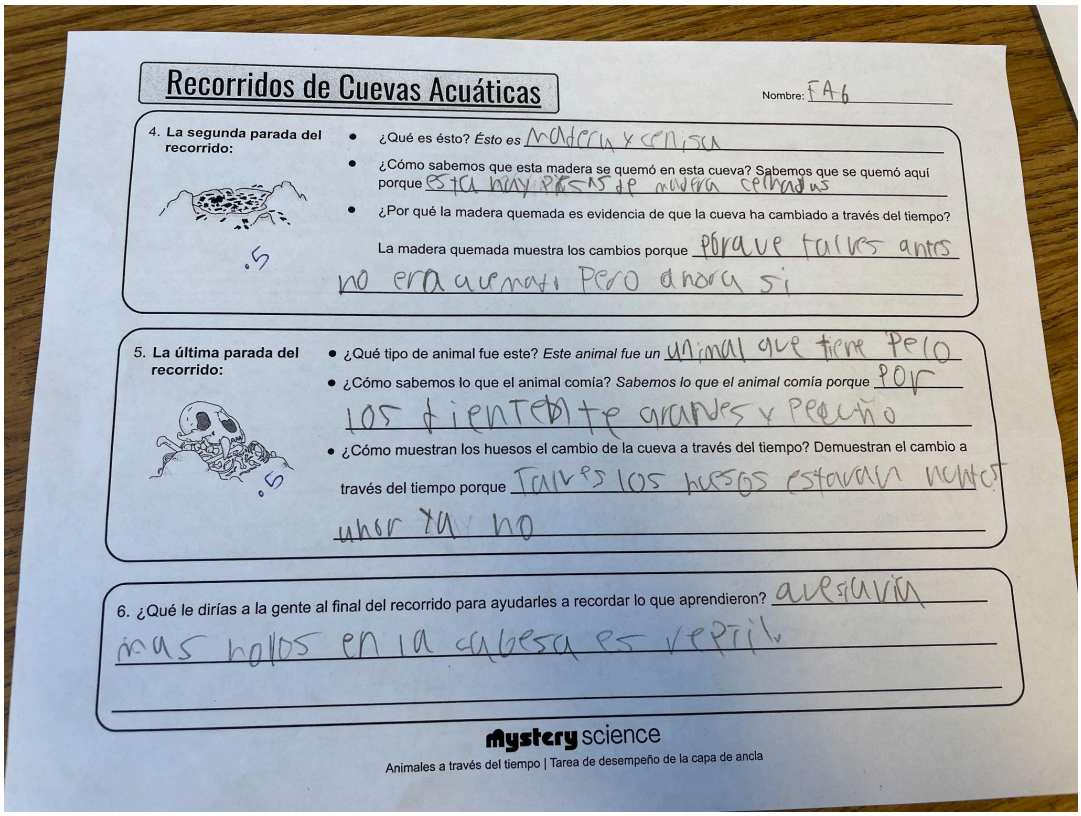
2. Escribe una introducción para los visitantes antes de entrar a la cueva. Menciona a dónde van a ir y acerca de qué van a aprender, pero aún no entres en detalles. hola como estas hoy van el mirar huesos y fossiles en una cueva so cuevan sus camaras

3. **La primera parada del recorrido:**

- ¿Qué son éstas? *Éstas son* huellas de dinosaurio
- ¿Cómo tendría que ser el suelo para formar tan buenas huellas? Las buenas huellas como éstas se *forman en* lodo que se hace en roca
- Estas huellas muestran que la cueva ha cambiado a través del tiempo. ¿Por qué? Estas huellas *muestran que la cueva ha cambiado porque* no avia agua pero ahora la cueva esta llenisima de agua

Mystery science

Animales a través del tiempo | Tarea de desempeño de la capa de ancla



Recorridos de Cuevas Acuáticas

Nombre: FAG

4. **La segunda parada del recorrido:**

- ¿Qué es ésto? *Ésto es* madera y ceniza
- ¿Cómo sabemos que esta madera se quemó en esta cueva? Sabemos que se quemó aquí porque esta hay pesas de madera cerradas
- ¿Por qué la madera quemada es evidencia de que la cueva ha cambiado a través del tiempo? La madera quemada muestra los cambios porque porque tarves antes no era quemada pero ahora si

5. **La última parada del recorrido:**

- ¿Qué tipo de animal fue este? *Este animal fue un* animal que tiene pelo
- ¿Cómo sabemos lo que el animal comía? *Sabemos lo que el animal comía porque* por los dientes grandes y pequeño
- ¿Cómo muestran los huesos el cambio de la cueva a través del tiempo? Demuestran el cambio a través del tiempo porque tarves los huesos estavan nomas ahor ya no

6. ¿Qué le dirías a la gente al final del recorrido para ayudarles a recordar lo que aprendieron? aveses mas huesos en la cabesa es reptil

Mystery science

Animales a través del tiempo | Tarea de desempeño de la capa de ancla

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3/3

Nombre: ALBERT

Recorridos de Cuevas Acuáticas

Imagina que eres un guía de recorridos en la cueva acuática. Te toca llevar a los clientes a bucear en la cueva y enseñarles lo que hay dentro de ella. Los descubrimientos nos han mostrado que la cueva ha cambiado a través del tiempo. **Tu principal objetivo es dar a conocer el *por qué* esos descubrimientos nos muestran los cambios de la cueva.** Utiliza estas hojas para planear lo que le dirás a los visitantes.

1. Inventa un nombre para tu empresa de excursiones. EXCURSION divertida con

2. Escribe una introducción para los visitantes antes de entrar a la cueva. Menciona a dónde van a ir y acerca de qué van a aprender, pero aún no entres en detalles. Pongansen sus Trajes y entren a la cueva y vean cosas FANTASTICAS

3. **La primera parada del recorrido:**

- ¿Qué son éstas? *Éstas son* Figuras en el suelo
- ¿Cómo tendría que ser el suelo para formar tan buenas huellas? *Las buenas huellas como éstas se forman en* Fango y lodo
- Estas huellas muestran que la cueva ha cambiado a través del tiempo. ¿Por qué? *Estas huellas muestran que la cueva ha cambiado porque* su habitat han cambiado porque antes solo era una cueva normal

Recorridos de Cuevas Acuáticas

Nombre: ALBERT

4. **La segunda parada del recorrido:**

- ¿Qué es ésto? *Ésto es* madera y ceniza
- ¿Cómo sabemos que esta madera se quemó en esta cueva? Sabemos que se quemó aquí porque unos habian para comer que hicieron Fuego
- ¿Por qué la madera quemada es evidencia de que la cueva ha cambiado a través del tiempo? La madera quemada muestra los cambios porque cuando ocurrio hubo desierto el Fuego y se hizo cueva de a una

5. **La última parada del recorrido:**

- ¿Qué tipo de animal fue este? *Este animal fue un* dientes de sable
- ¿Cómo sabemos lo que el animal comía? *Sabemos lo que el animal comía porque* Fijo dientes afilados y comia lo Podria tigre comer tambien
- ¿Cómo muestran los huesos el cambio de la cueva a través del tiempo? Demuestran el cambio a través del tiempo porque los nos dicen antes en la cueva vivia animales

6. ¿Qué le dirías a la gente al final del recorrido para ayudarles a recordar lo que aprendieron? Recuerden amigos siempre Revisen en las cuevas para no encontrar cosas increibles

mystery science
Animales a través del tiempo | Tarea de desempeño de la capa de ancla

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Lesson 8: How Did Utah Change

Date: October 24, 2022

Standard 4.1.3 Analyze and interpret data from fossils to provide evidence of the stability and change in organisms and environments from long ago. Emphasize using the structures of fossils to make inferences about ancient organisms. Examples of fossils and environments could include comparing a trilobite with a horseshoe crab in an ocean environment or using a fossil footprint to determine the size of a dinosaur. (LS4.A)

Standard 4.1.4 Engage in argument from evidence based on patterns in rock layers and fossils found in those layers to support an explanation that environments have changed over time. Emphasize the relationship between fossils and past environments. Examples could include tropical plant fossils found in Arctic areas and rock layers with marine shell fossils found above rock layers with land plant fossils. (ESS1.C)

Objective: Students will be able to explain how the habitats have changed over time and how fossils provide evidence of this.

Differentiation:

Kensi: She has been missing almost this entire unit. Take time to check in with her and explain any misunderstandings.

Resources:

Flipgrid
Chromebooks
Headphones
How did Utah Look Slides
Mystery Science: What Did Your Town Look Like?
Fossils cutouts
Utah (throughout ages) cutouts
Notebooks
Glue

Assessments:

a) **Formative:**
   Discussion questions
   Partner Questions

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State/Fossil Matching

b) **Summative:**
Flipgrid response

Procedures:

Activating prior knowledge:

Review of the cave tour writing: What have we learned about how the cave habitat has changed over time?

Guided Practice:

Mystery Science Video:
Ask questions throughout:

Video 1
0:29: ¿Qué cambios has visto aqui en Utah?
End of video: ¿Cómo puedes averiguar cómo haya cambiado tu ciudad?

Video 2:
0:41: ¿Qué otras cosas podemos encontrar en una exhibición de un museo?
1:15: ¿Por qué crees que los científicos encontraron fósiles bajo tierra?

Video 3
0:28: Que piensen que va a pasar con los cuerpos de los dinosaurios?
0:44: ¿Qué pasa con las partes más suaves como la piel y los músculos? Qué pasa con los huesos?
1:05: ¿Han encontrado algo que estaba lleno de polvo antes?
1:24: ¿Cómo llegó el polvo sobre los huesos?
1:44: ¿Cómo llegaron enterrados bajo la tierra los huesos? ¿Cómo se quedan preservados durante millones de años?
1:50: ¿Cuáles son los tipos más conocidos de fósiles?
2:07: ¿Qué tipos de pistas podemos encontrar?

Video 5
0:37: ¿Qué tipos de pistas nos dan estos fósiles?
0:51: ¿En donde encontraron los fósiles? Chicago es un océano/cerca a un océano?
1:00 ¿Qué tipo de hábitat era Chicago antes?

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1:17: El hábitat de Chicago cambió? Cómo lo sabemos?

What has changed in Utah:

- Give each student a packet of the cutouts of Utah throughout time (as seen in slides) and the cutouts of the fossils found in Utah (also as seen in slides).
- Students will then need to observe the pictures and try to match the fossils with the time era that they were found. For example, they might guess that the fish came from when Utah was completely covered by an ocean.
- We will then go through each one, talk about their predictions and why, and then reveal the true answer. Students can then glue the pair that go together in their notebooks.
- Next, I will point out that the red dot in each slide represents Kearns. We will talk about how Kearns looked in each era. For example, was it covered in water, was it a desert?
- Discussion: How does this provide evidence that Utah's habitat has changed?
- Discuss the fossils that were found there and why.
- Students will then respond to the questions of how Utah has changed over time and what evidence they have of that in a flipgrid video.

Closure:

Class discussion: If you went in a time machine, which era of Utah's geographical history would you like to visit?

Reflection:

I think the idea that Utah has changed was really driven home in this lesson as we imagined what Kearns looked like in each of the eras. For some of them, I had students look out the window and imagine everything was covered in water or in sand, etc. Then having students explain what they understood on Flipgrid was great. Some students who are more hesitant to write were more

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willing to show their understanding when explaining orally. One thing that I would have done differently would have been to be more clear in my explanations of procedures. For example, when I had students gluing the pairs in their notebooks, I should have been more clear about the organization. In many of their notebooks, you cannot tell which fossil is paired with which map because they are all clumped onto one page. Thus, I would tell them to put them in rows and use several pages next time. You can see the FlipGrid student responses in the link below.

Flipgrid Videos

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KINGDOM KEEPERS
Scare
Hoja de un arbol
Dinosaurio
Madera
Amonitas (como pulpo)

Back to Top


Purified Wa
SALT LAKE CITY
SLC.
Madera
Hoja de un árbol
Trilobites

Back to Top


SLC
Madera
Trilobites
Hoja de un arbol
Source: Wikipedia
Dinosaurio
Colmillo de mamu
Amonitas (como pulpo)
Corales de Cuerno
Dinosaurio

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Lesson 9: The Fossilization Process

Date: October 27, 2022

Standard 4.1.4 Engage in argument from evidence based on patterns in rock layers and fossils found in those layers to support an explanation that environments have changed over time. Emphasize the relationship between fossils and past environments. Examples could include tropical plant fossils found in Arctic areas and rock layers with marine shell fossils found above rock layers with land plant fossils. (ESS1.C)

Objective: Students will be able to explain the process of fossilization in the proper order using scientific vocabulary.

Differentiation:
Evelyn: Have her repeat my instructions so I know that she knows what to do.
Albert: Define difficult vocabulary from the video and use parallel vocabulary that will be required on the CFA.

Resources:
Fossilization slides
How to Fossilize Yourself (Embedded in slides)
Fossil Process Cards for each student
Kahoot Game

Assessments:

a) **Formative:**
   Fossilization cards
   Response to video questions
   Partner talk
b) **Summative:**
   Kahoot Game responses

Procedures:

a) **Introduction:**
   - Give each student a copy of the fossilization cards.
   - Instruct students to cut them into 8 different cards.
   - Have students order them from first to last according to what they would guess should be the correct order.

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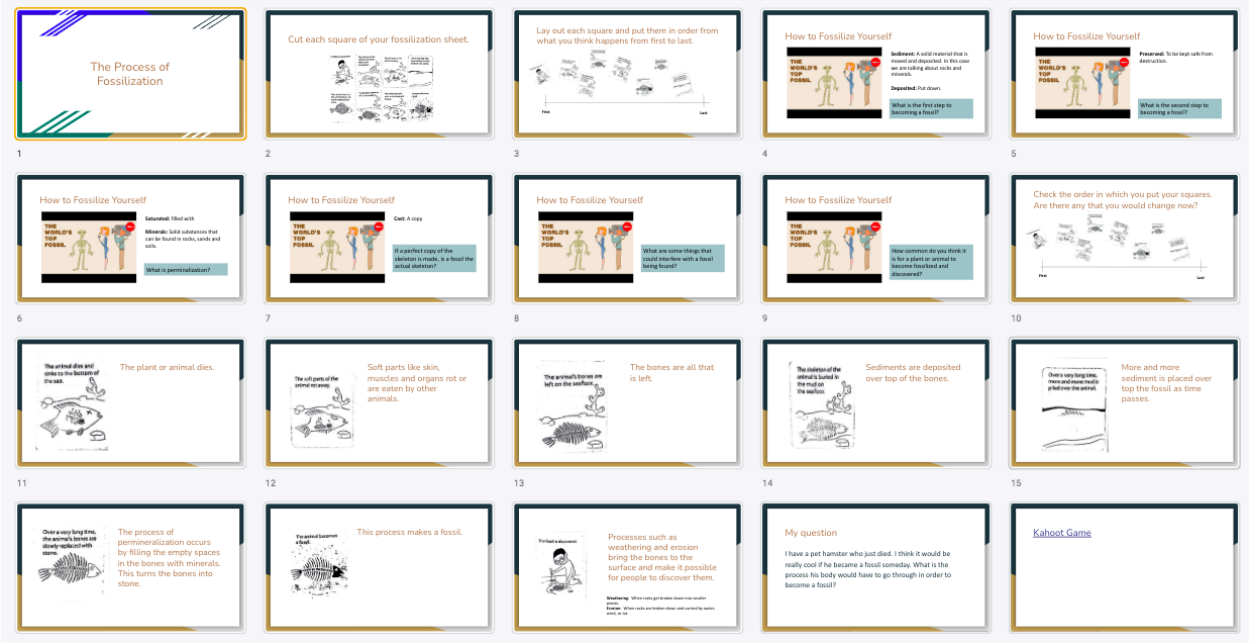
b) Guided Practice:

- Have students come to the carpet. Watch the video “How to Fossilize Yourself” and ask questions throughout as shown in slides. Preview vocabulary for each section as some of the words are new and tricky. Definitions in slides.
- Now that students have learned the order of fossilization in the video, have them re-order or fix the order in their notebooks. Go through each one together and review what it means.
- Have students glue the cards in their science notebooks in the correct order.
- Review Hamster scenario: My hamster just died and I want him to become a fossil. What are the steps he needs to go through in order to become a fossil? Go through the steps together as a class.



c) Independent Practice:

- Play the Kahoot game in order to test the students' understanding and review what they learned.

Closure:

- Tell your partner, what are the steps to fossilization.

Reflection:

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I am really glad that we previewed the vocabulary in the video. I think that really helped the students to get a better grasp of what the video was teaching because they had that. I think the cards worked well too. I think it worked well having the students guess the fossilization process first and then fixing it after the video. One thing that I would have done differently is have them glue the cards in their notebooks right away after the video in the correct order. It was not until this point in the lesson that I realized I did not know what to do with the cards now that they were all cut up. I had to ask Mrs. Ceballos for plastic bags but she suggested that we just have them glue it in their notebooks (which was a much better idea). But then it took us longer to get the notebooks and glue out and go through the process of gluing them in. So in the future, I would try to think about this procedure beforehand and plan it better.

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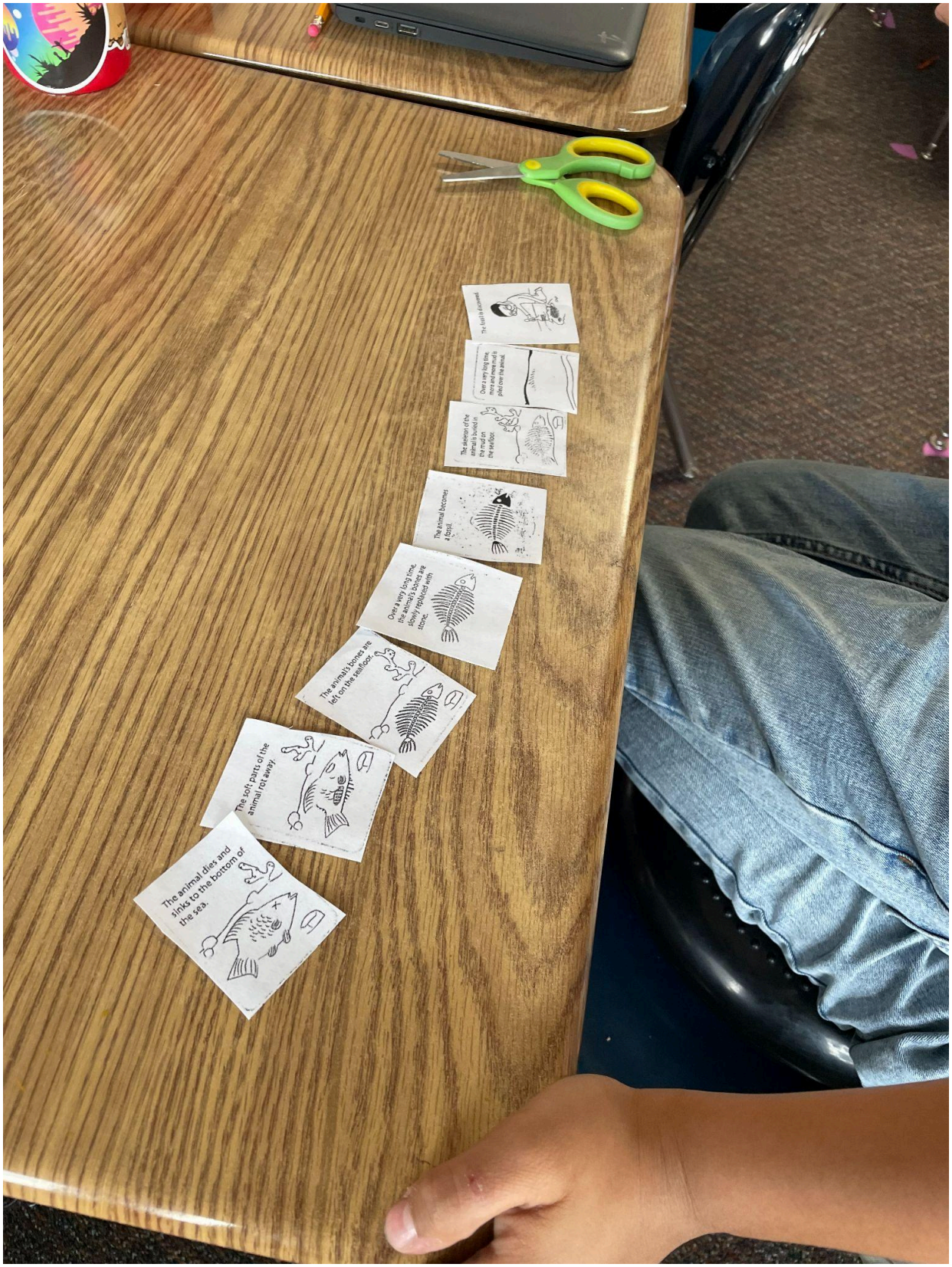
The animal dies and sinks to the bottom of the sea.
The soft parts of the animal rot away.
The animal's bones are left on the seafloor.
Over a very long time, the animal's bones are slowly replaced with stone.
The animal becomes a fossil.
The skeleton of the animal is buried in the mud on the seafloor.
Over a very long time, more and more mud is piled over the animal.

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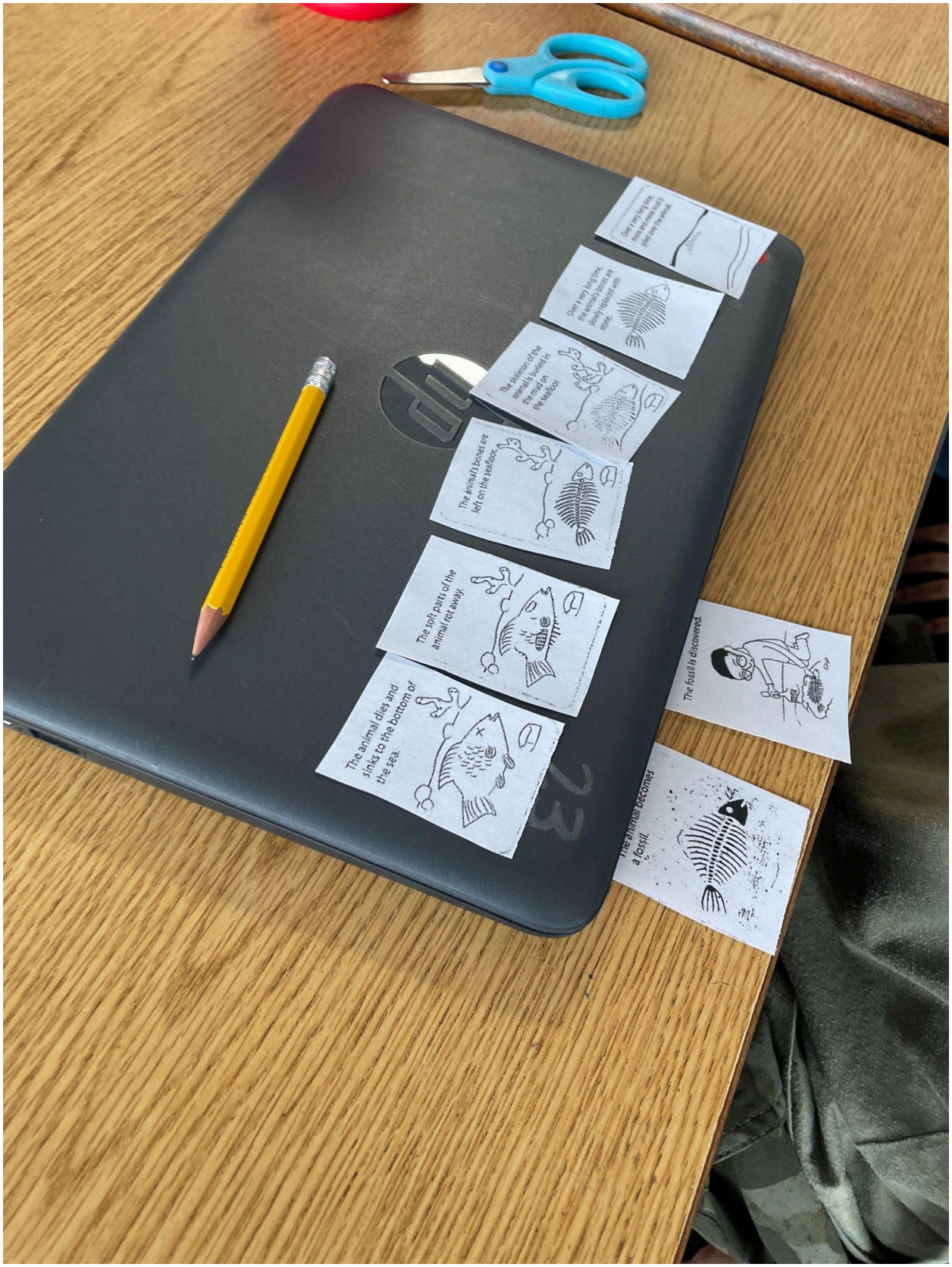
The animal dies and sinks to the bottom of the sea.
The soft parts of the animal rot away.
The animal's bones are left on the seafloor.
The skeleton of the animal is buried in the mud on the seafloor.
The fossil is discovered.
The animal becomes a fossil.

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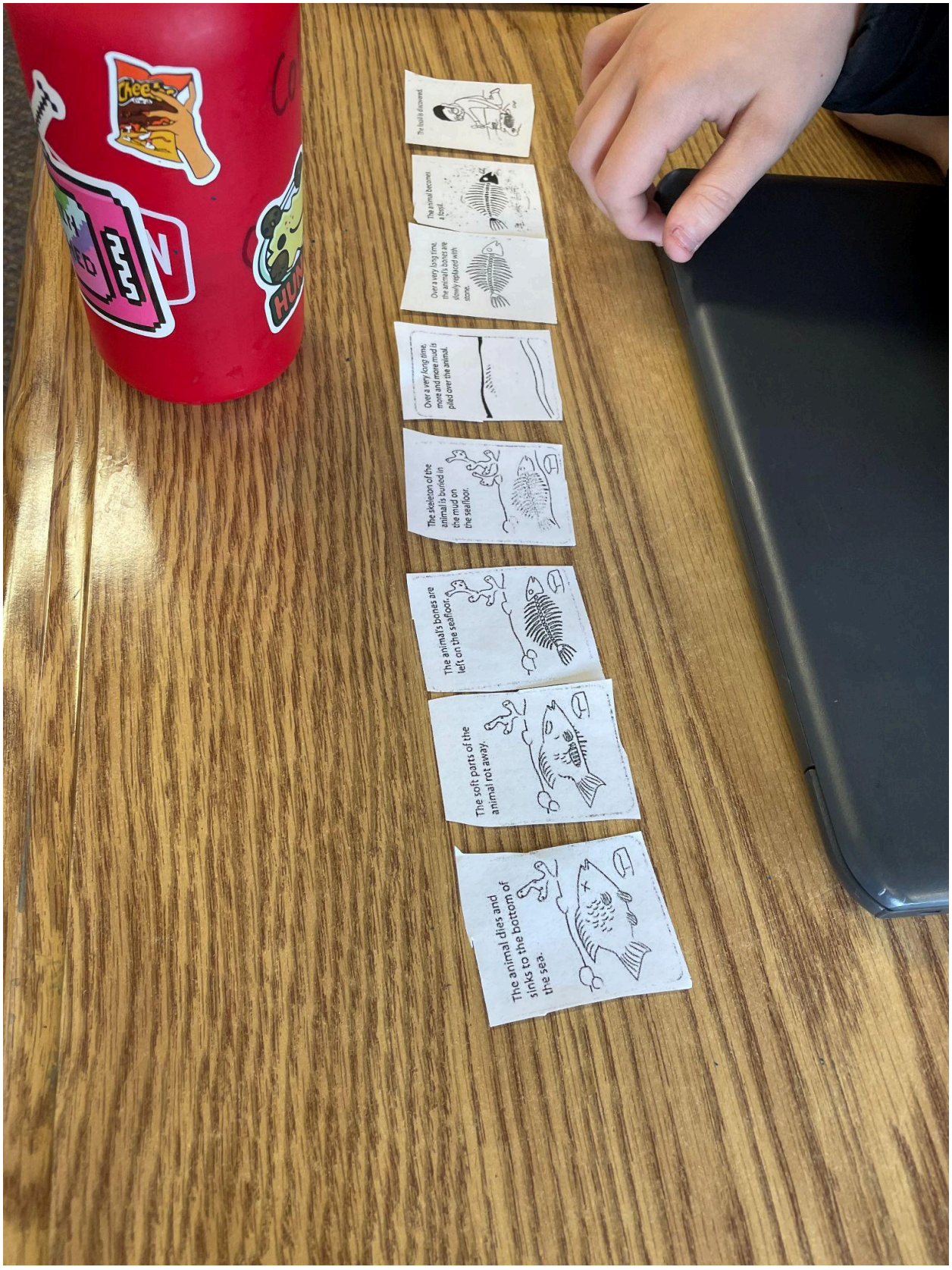
The animal dies and sinks to the bottom of the sea.
The soft parts of the animal rot away.
The animal's bones are left on the seafloor.
The skeleton of the animal is buried in the mud on the seafloor.
Over a very long time, more and more mud is piled over the animal.
Over a very long time, the animal's bones are slowly replaced with stone.
The animal becomes a fossil.
The fossil is discovered.

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Lesson 10: Mystery Fossil

Date: October 31, 2022

Standard 4.1.3 Analyze and interpret data from fossils to provide evidence of the stability and change in organisms and environments from long ago. Emphasize using the structures of fossils to make inferences about ancient organisms. Examples of fossils and environments could include comparing a trilobite with a horseshoe crab in an ocean environment or using a fossil footprint to determine the size of a dinosaur. (LS4.A)

Objective: Students will be able to make observations about the fossil and predict the animal based on the characteristics observed.

Differentiation:

Tony, Iker, and Kensi: These three students were absent when we did the dinosaur teeth investigation. Using the structures of the fossils to determine which animal it is will be something new for them. Provide extra support by listening closely to their partner discussions and providing verbal support where needed.

Resources:

Mammoth Nearpod
Science Notebooks
Pencils
Review Questions

Assessments:

a) **Formative:**
   Nearpod question responses
   Notebook drawings/notes
   Pair/shares
   Class discussions

b) **Summative:**
   Final Nearpod question where students guess the animal.

Procedures:

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a) **Activating prior knowledge:**

Fossils Video:
0:17 What are fossils?
0:50 How do they know this dinosaur is a carnivore?
1:37 How has Utah Changed?
4:00 Are fossils real bones? Is a calavara (skull) a fossil?

b) **Guided Practice:**
The students will go through a series of investigations and questions as part of the nearpod in order to make some guesses about the mysterious fossil:

- First, they will be shown the skull in 3D that they can move around. Then they will make a guess.
- Next, they will be shown the entire body in 3D that they can move around. Then they will make a guess.
- Now, they will be shown the skull in comparison with 4 other skulls and say which skull it most looks like.
- Then, they will be shown the feet of four other animals and again say which one the feet most look like.
- Finally, the students will be told that the fossils dated back to the ice ages in Utah. A picture of the ice ages will be shown.
- Students will then be asked which animal they think it will be and given a chance to make a guess.

Closure:

Review Questions:

Place students in two circles– one inside of the other. The inside circle will face the outside circle. The teacher will display a question on the board and students will discuss their answer. When 30 seconds are up, the teacher will tell the students in the outside circle to rotate. Then the teacher will display the next question on the board.

Reflection:

I think this lesson went okay given the circumstances. It was at the end of the Halloween day so I think the kids were feeling a little bit restless. I think I could have done a better job preparing for these circumstances, knowing that that is when I would be teaching this lesson. Thus, I wish I had employed more engagement strategies given the circumstances. That being said, at the end

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of the lesson, I asked one review question. I had planned on doing the inside/outside circle and asking about 10 questions, but I only had time for one done in a pair share. So I decided that the most important question was, "How do fossils teach us about the past?" because I wanted to see what they had learned overall from the unit. And they answered so well! I let about half the class answer because they all wanted to share and they talked about how fossils teach about how habitats have changed. That was an exciting moment as a teacher!

Open Ended Question — Ahora comparemos el cráneo del fósil de misterio con cuatro animales modernos; El eón, el buitre, el elefante y el bisonte. De los cuatro, ¿cuál tiene más similitudes? ¿Cuál tiene más diferencias? ¿Cuál es tu evidencia?

Date	Nickname	Other	Response
10/31/2022	Abrahamn castillo	castilllo	el elefante por la posición de el fósil
10/31/2022	ADRIK		elefante
10/31/2022	AJ		el elefante
10/31/2022	annalee		el elephante por
10/31/2022	Anthony		bisonte prqe tiene el horns
10/31/2022	Benjamin	Super Mario	
10/31/2022	Benjamin	Super Mario	El craneo y el buitre se parecen a un reptile
10/31/2022	Brenda garcia	brenda	el bisonte
10/31/2022	Cole		el Elefante
10/31/2022	Davlynn A. Lazarte	Davlynn	el elefante porque huellas por los ojos
10/31/2022	Eric	m	el elefante por que es mas similar por su boca
10/31/2022	Evelyn		el elefante
10/31/2022	iker		un elephante
10/31/2022	kensi n	kens	yo pienso por el elephante esta mas serca del el misterio porque, el
10/31/2022	kimberly	banana	elefante
10/31/2022	maurilio marquez reyes	muarilio	
10/31/2022	maurilio marquez reyes	muarilio	el elefante porque tiene la baca
10/31/2022	michael		el elefante el dente dene los dente de relies
10/31/2022	samantha		el elefante borgue la parte de la boca

9/12

Poll Stats

10% No Answer

90% Free Text

Open Ended Question — ¡Ahora hagamos lo mismo pero con los pies! ¿Qué pies se parecen más a nuestro fósil de misterio? ¿Cuáles se ven más diferentes? ¿Cuál es tu evidencia?

Date	Nickname	Other	Response
10/31/2022	Abrahamn castillo	castilllo	el elefante por los dedos que se paresen yla misma
10/31/2022	ADRIK		elefante
10/31/2022	AJ		el elefante!
10/31/2022	annalee		
10/31/2022	Anthony		elefanta
10/31/2022	Benjamin	Super Mario	
10/31/2022	Benjamin	Super Mario	el elefante porque se parecen el mismo.
10/31/2022	Brenda garcia	brenda	elefante
10/31/2022	Cole		el Elefante
10/31/2022	Davlynn A. Lazarte	Davlynn	el elefante
10/31/2022	Eric	m	el elefant
10/31/2022	Evelyn		
10/31/2022	iker		
10/31/2022	kensi n	kens	
10/31/2022	kimberly	banana	elefante
10/31/2022	maurilio marquez reyes	muarilio	
10/31/2022	maurilio marquez reyes	muarilio	
10/31/2022	michael		el elefante por los dethos
10/31/2022	samantha		la elefante borgue los dedos
10/31/2022	Spencer		
10/31/2022	valeria		el elefante porque tiene un forma muy poresida

Poll Stats

38% No Answer

62% Free Text

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Lesson: What Fossil Is This? (1)

nearpod Post Session Report

Poll ¡Hora de votar! ¿Qué animal moderno es el pariente más cercano a nuestro fósil de misterio?

Date	Nickname	Other	Response
10/31/2022	Abrahamn castillo	castilllo	el elefante
10/31/2022	ADRIK		el elefante
10/31/2022	AJ		el elefante
10/31/2022	annalee		el elefante
10/31/2022	Anthony		el bisonte
10/31/2022	Benjamin	Super Mario	
10/31/2022	Benjamin	Super Mario	el elefante
10/31/2022	Brenda garcia	brenda	el elefante
10/31/2022	Cole		el elefante
10/31/2022	Davlynn A. Lazarte	Davlynn	el elefante
10/31/2022	Eric	m	el elefante
10/31/2022	Evelyn		el elefante
10/31/2022	iker		el elefante
10/31/2022	kensi n	kens	el elefante
10/31/2022	kimberly	banana	el elefante
10/31/2022	maurilio marquez reyes	muarilio	
10/31/2022	maurilio marquez reyes	muarilio	el elefante
10/31/2022	michael		el elefante
10/31/2022	samantha		el elefante
10/31/2022	Spencer		el elefante
10/31/2022	valeria		el elefante

Poll Stats

10% No Answer

0% el león

0% el buitre

86% el elefante

5% el bisonte

Lesson: What Fossil Is This? (1)

nearpod Post Session Report

Open Ended Question ¡Es hora de una última pieza del rompecabezas! Sabemos que nuestro fósil de misterio fue encontrado en rocas que de hace 12.000 años, durante la Edad de Hielo, aquí en Utah. Mira la representación de un artista de Utah de ese período de tiempo. Según nuestras observaciones y comparaciones con los animales modernos, ¿qué piensas que es nuestro fósil de misterio y por qué?

Date	Nickname	Other	Response
10/31/2022	Abrahamn castillo	castilllo	diente de sable
10/31/2022	ADRIK		el mamut
10/31/2022	AJ		mammuth
10/31/2022	annalee		el mamut porque no es vivio hoy y se mira como el mamut es similar a la elephante que tenemos hoy en dia y las dos estan grandes.
10/31/2022	Anthony		elefante porqe es simelar de un mamuth
10/31/2022	Benjamin	Super Mario	
10/31/2022	Benjamin	Super Mario	el mamut porque en el foto ay muchos mamuts.
10/31/2022	Brenda garcia	brenda	el dientes de save
10/31/2022	Cole		mammut
10/31/2022	Davlynn A. Lazarte	Davlynn	el mamut es el de fósil misterio
10/31/2022	Eric	m	yo pienso que es un mamut
10/31/2022	Evelyn		
10/31/2022	iker		un elephante
10/31/2022	kensi n	kens	Yo pienso que es el elephante del misterio poque es el el familia del mamut.
10/31/2022	kimberly	banana	diente de sable
10/31/2022	maurilio marquez reyes	muarilio	
10/31/2022	maurilio marquez reyes	muarilio	una iguana
10/31/2022	michael		el elefante por la foto
10/31/2022	samantha		la mamoto borgue ya no sta vivo
10/31/2022	Spencer		Un mamut porque hay muchos en este foto.
10/31/2022	valeria		un elefante o mamut porque se ven así en la foto

Poll Stats

14% No Answer

86% Free Text

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Fossil Unit Post-Assessment

4.1.3 Level 2

1. Fossils:

a. come only from dinosaurs and plants

b. are evidence of once living plants & animals

c. are evidence of once living animals

d. show us that animals never change

2. Use the words in the box and correctly fill in the blanks for how a mineral replacement fossil would be made.

rot/get eaten	minerals	sediment	erosion

An animal dies & its soft parts _____. The animal is buried by layers & layers of _____. Over time the animal's hard parts are replaced by water filled with _____. Weathering & _____bring the fossil to the surface & uncover it to be found.

3. Below the ice in the arctic are rocks with fossils. Some fossils found there are of plants that only grow in warm places.

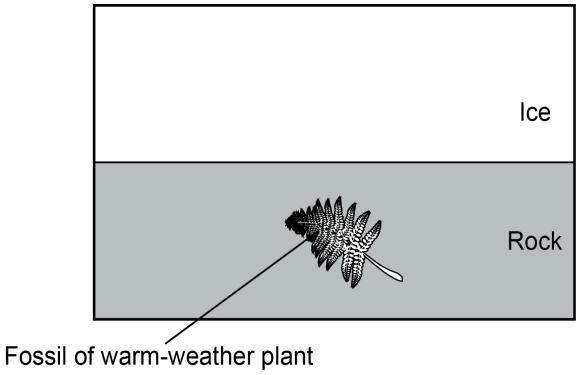
Finding this fossil can tell us what?

a. The land was not always a very cold area.

b. Some plants can grow in rock.

c. Rock is always covered with ice.

d. The arctic is not a very old place.



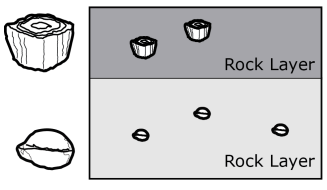
4. The diagram shows one rock layer on top of another. The table shows the habitats of different plants and animals. Using this information, what was the order of habitats in this area?

a. Forest then seashore

b. Seashore then desert

c. Swamp then forest

d. Seashore then forest



Fossil	Identification	Habitat
	Tree	Forest
	Mouse skull	Deserts
	Alligator toe bone	Marshes and swamps
	Clam shell	Seashore

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A student was shown a fossil of a dragonfly that was found in the frozen wastelands of Antarctica and noticed that it looked like a dragonfly they saw near a pond by their house.

Figure 1

Dragonfly Comparison

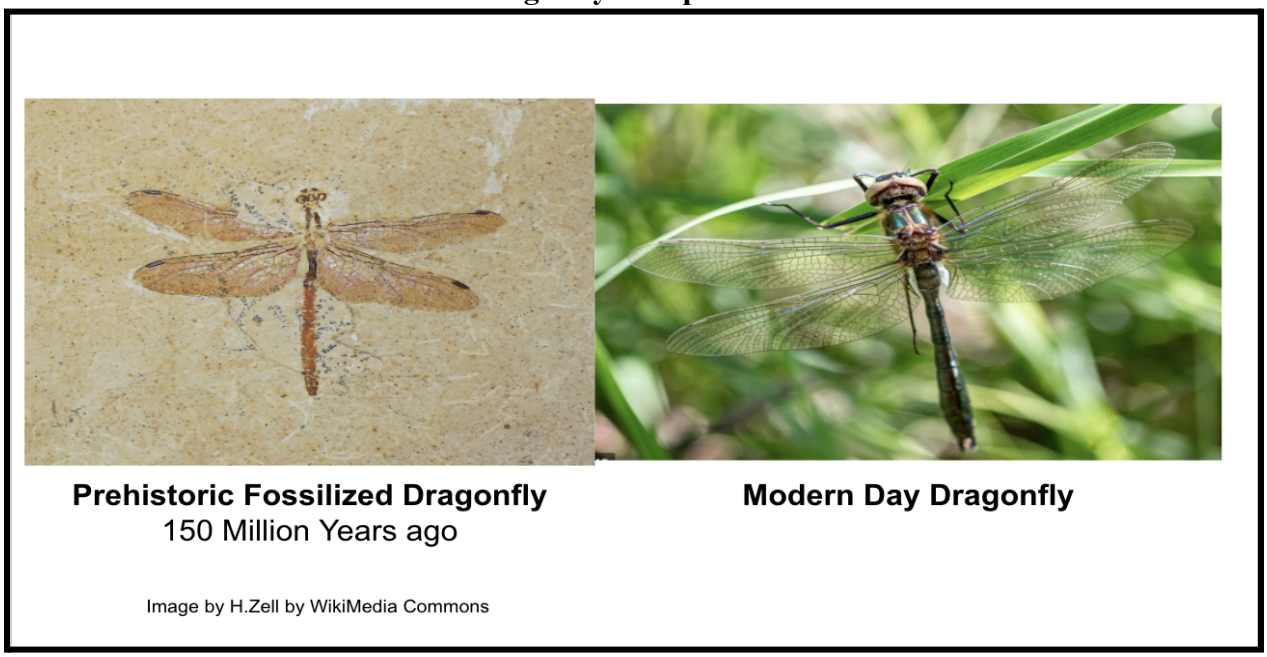
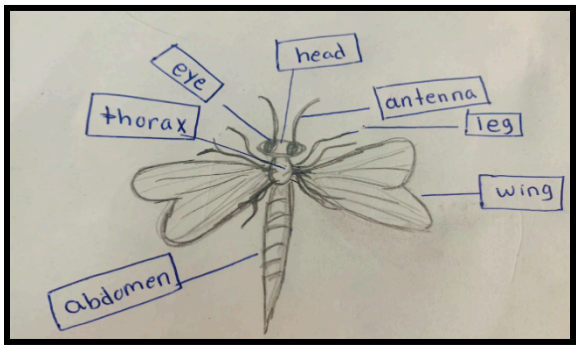


Figure 2

Dragonfly Body Parts



Reading 1

Dragonflies

Dragonflies are large colorful insects usually found in wetland environments. They live near freshwater such as riverbanks, canals, ditches, ponds and lakes.

Dragonflies catch their insect prey by grabbing it with their feet. A single dragonfly can eat 30 to hundreds of mosquitoes per day.

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Dragonflies are expert fliers. They can fly straight up and down, hover like a helicopter and even mate mid-air. If they can't fly, they'll starve because they only eat prey they catch while flying. Nearly all of the dragonfly's head is its eye, so they have incredible vision that can help them see almost every angle except right behind them.
The specific structures of the dragonfly help it to survive in its wetland environment.

Fossil evidence shows that they have been flying around for over 300 million years! Many dragonfly fossils have been found in the frozen lands of Antarctica. Modern dragonflies have wingspans of only two to five inches, but fossil dragonflies have been found with wingspans of up to two feet.

Level 3
5. Use Figure 1 to help you answer this question:
Put an x on the table below for each characteristic that the fossilized dragonfly and modern-day dragonfly have.

	Fossilized Dragonfly	**Modern-day Dragonfly**
Has Head		
Has Abdomen		
Has 4 Wings		
Is Living		
Has Antennae		
Is Colorful		

6. In the paragraph below, circle the correct choice that makes each statement true.

Today, Antarctica is a **(*frozen / tropical*)** environment. Because the dragonfly fossil was found in Antarctica, we can infer that Antarctica was once ***(similar / different)*** to environments where dragonflies live today and that Antarctica's environment has ***(stayed the same / changed)*** over time.

7.What can we infer about the environment where the fossilized dragonfly lived?

a. The prehistoric dragonfly most likely lived in a wetland environment because it has similar structures to the modern dragonfly.

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b. The prehistoric dragonfly most likely lived in a desert environment because their structures helped them survive in the desert.

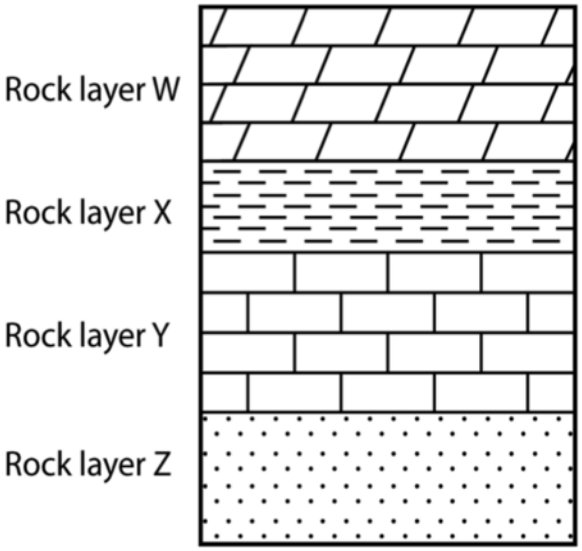
c. The prehistoric dragonfly most likely lived in the ocean because they need to live near large bodies of water.

d. The prehistoric dragonfly most likely lived in a cold polar region because they need a harsh cold climate to survive.

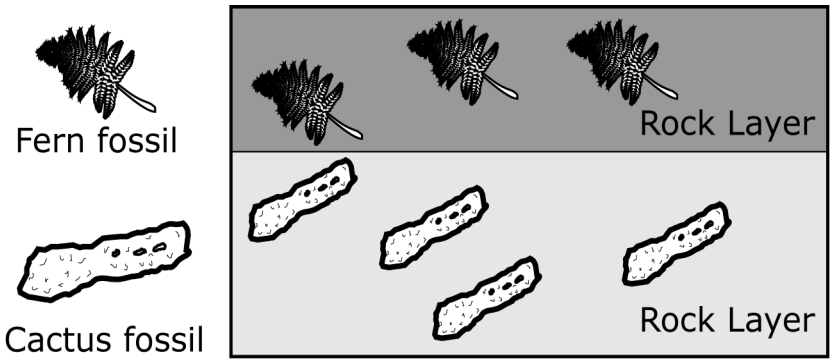
4.1.4 Level 2

8. Several layers of rock are illustrated in their unchanged positions. Which of the following conclusions is supported by the data in this illustration? Select all that apply.

a. Rock layer W is the oldest of all the rock layers shown.
b. Rock layer X was formed just before rock layer W.
c. Rock layer Y is twice as old as rock layer W.
d. Rock layer Z is the oldest of all the rock layers shown.
e. Rock layer Y is younger than rock layer W.
f. Rock layer W is the youngest of all the rock layers.
g. Rock layer W and rock layer Y look the same so they were formed at the same time.



9. A diagram showing the types of fossils which were discovered in two rock layers is provided.



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Ferns are plants found in areas with very wet soil, while cacti do not need much water at all to survive. Based on this information, it can be concluded that the area where these rock layers formed changed in what way?

a. Lots of plants changing to almost no plants
b. Cold and icy changing to very hot
c. Deep ocean changing to high mountain
d. Very dry changing to much more damp

4.1.4 Level 3

10. The tables provide information on plant and animal fossils.

Fossil	Description	Animal's Habitat
	Fish skull	Fresh water pond and lakes
	Mouse skull	Deserts
	Alligator toe bone	Marshes and swamps
	Shark's tooth	Deep ocean

Fossil	Description	Plant's Habitat
	Fern	Swamps, marshland
	Seaweed	Salt water
	Marsh grass	Beside fresh water
	Cactus	Deserts

Based on the information in the table, match which animal fossil and which plant fossil were likely found in the same layer of rock.

Animal fossil	Plant fossil	Why do you think these fossils were found in the same rock layer?
Fish skull		
Mouse skull		
Alligator toe bone		
Shark's tooth		

11. A new interstate highway is being built! Construction workers, while making room for the new road, cut through the side of a hill. The drawing below shows what they observed.

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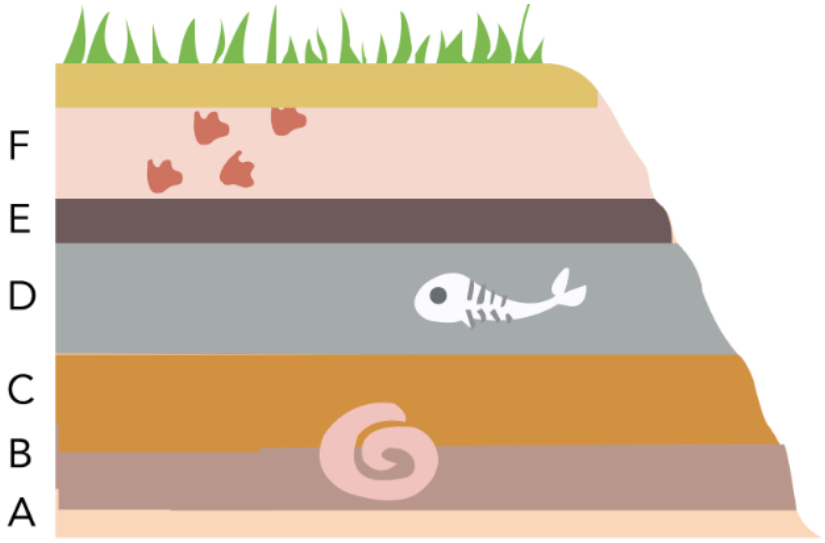

Using evidence from the diagram, you will make 2 claims about how the environment has changed over time. You can use evidence from the layers of rock or fossils found in the rock layers.

	What do you observe or notice in the diagram? (evidence)	What does the observation tell us about the previous environments of the rock layers? (claim)
1.	_____ _____ _____ _____ _____	_____ _____ _____ _____
2.	_____ _____ _____ _____	_____ _____ _____ _____

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	_____	

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Unit Post-Assessment Key

Name: _____ Date: _____

4.1.3 Level 2

1. Fossils:

a. come only from dinosaurs and plants

b. are evidence of once living plants & animals

c. are evidence of once living animals

d. show us that animals never change

2. Use the words in the box and correctly fill in the blanks for how a mineral replacement fossil would be made.

rot/get eaten	minerals	sediment	erosion

An animal dies & its soft parts rot/get eaten. The animal is buried by layers & layers of sediment. Over time the animal's hard parts are replaced by water filled with minerals. Weathering & erosion bring the fossil to the surface & uncover it to be found.

3. Below the ice in the arctic are rocks with fossils. Some fossils found there are of plants that only grow in warm places.

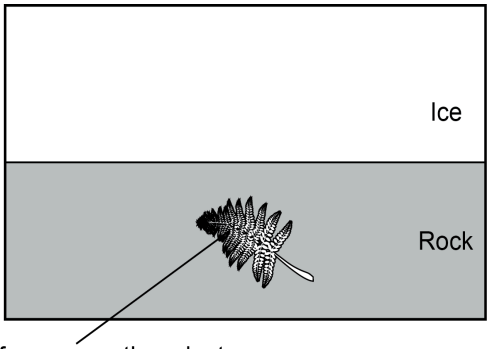
Finding this fossil can tell us what?

a. The land was not always a very cold area.

b. Some plants can grow in rock.

c. Rock is always covered with ice.

d. The arctic is not a very old place.



4. The diagram shows one rock layer on top of another. The table shows the habitats of different plants and animals. Using this information, what was the order of habitats in this area?

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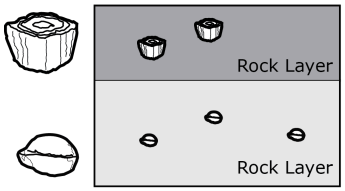

Fossil	Identification	Habitat
	Tree	Forest
	Mouse skull	Deserts
	Alligator toe bone	Marshes and swamps
	Clam shell	Seashore

a. Forest then seashore

b. Seashore then desert

c. Swamp then forest

d. Seashore then forest

A student was shown a fossil of a dragonfly that was found in the frozen wastelands of Antarctica and noticed that it looked like a dragonfly they saw near a pond by their house.

Figure 1
Dragonfly Comparison

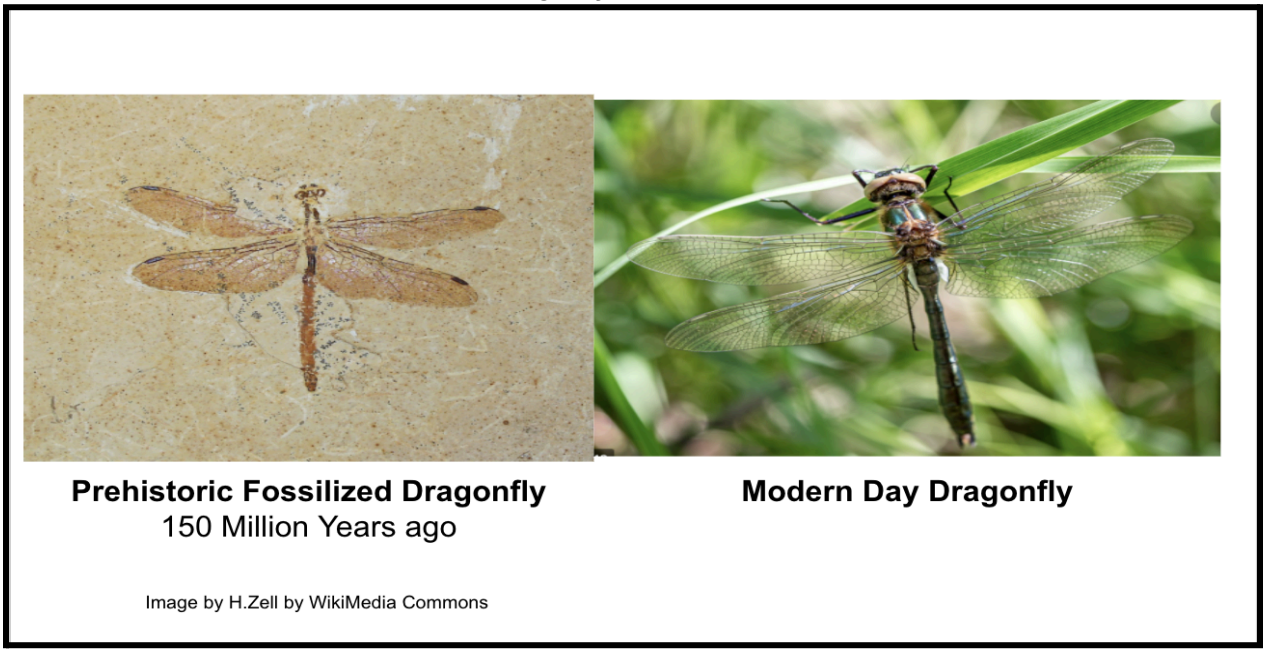

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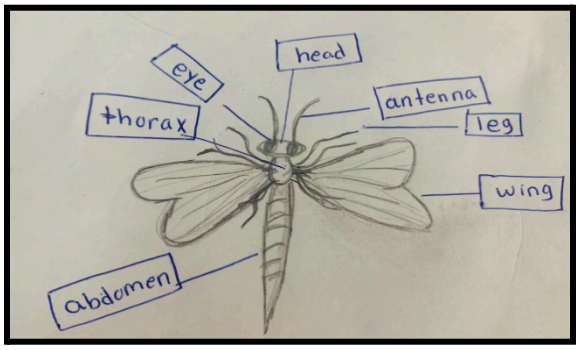
Figure 2
Dragonfly Body Parts



Reading 1

Dragonflies

Dragonflies are large colorful insects usually found in wetland environments. They live near freshwater such as riverbanks, canals, ditches, ponds and lakes.

Dragonflies catch their insect prey by grabbing it with their feet. A single dragonfly can eat 30 to hundreds of mosquitoes per day.

Dragonflies are expert fliers. They can fly straight up and down, hover like a helicopter and even mate mid-air. If they can't fly, they'll starve because they only eat prey they catch while flying. Nearly all of the dragonfly's head is eye, so they have incredible vision that can help them see almost every angle except right behind them.
The specific structures of the dragonfly help it to survive in its wetland environment.

Fossil evidence shows that they have been flying around for over 300 million years! Many dragonfly fossils have been found in the frozen lands of Antarctica. Modern dragonflies have wingspans of only two to five inches, but fossil dragonflies have been found with wingspans of up to two feet.

Level 3

5. Use Figure 1 to help you answer this question:
Put an x on the table below for each characteristic that the fossilized dragonfly and modern-day dragonfly have.

	Fossilized Dragonfly	Modern-day Dragonfly
Has Head	X	X
Has Abdomen	X	X
Has 4 Wings	X	X
Is Living		X

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Has Antennae		X
Is Colorful		X

6. In the paragraph below, circle the correct choice that makes each statement true.

Today, Antarctica is a ***(frozen / tropical)*** environment. Because the dragonfly fossil was found in Antarctica, we can infer that Antarctica was once ***(similar / different)*** to environments where dragonflies live today and that Antarctica's environment has ***(stayed the same / changed)*** over time.

7.What can we infer about the environment where the fossilized dragonfly lived?

a. The prehistoric dragonfly most likely lived in a wetland environment because it has similar structures to the modern dragonfly.

b. The prehistoric dragonfly most likely lived in a desert environment because their structures helped them survive in the desert.

c. The prehistoric dragonfly most likely lived in the ocean because they need to live near large bodies of water.

d. The prehistoric dragonfly most likely lived in a cold polar region because they need a harsh cold climate to survive.

4.1.4 Level 2

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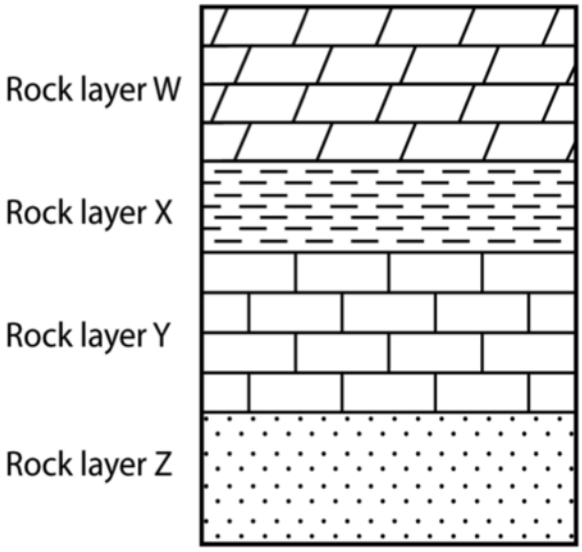
8. Several layers of rock are illustrated in their unchanged positions. Which of the following conclusions is supported by the data in this illustration? Select all that apply.



a. Rock layer W is the oldest of all the rock layers shown.
b. Rock layer X was formed just before rock layer W.
c. Rock layer Y is twice as old as rock layer W.
d. Rock layer Z is the oldest of all the rock layers shown.
e. Rock layer Y is younger than rock layer W.
f. Rock layer W is the youngest of all the rock layers.
g. Rock layer W and rock layer Y look the same so they were formed at the same time.

9. A diagram showing the types of fossils which were discovered in two rock layers is provided.

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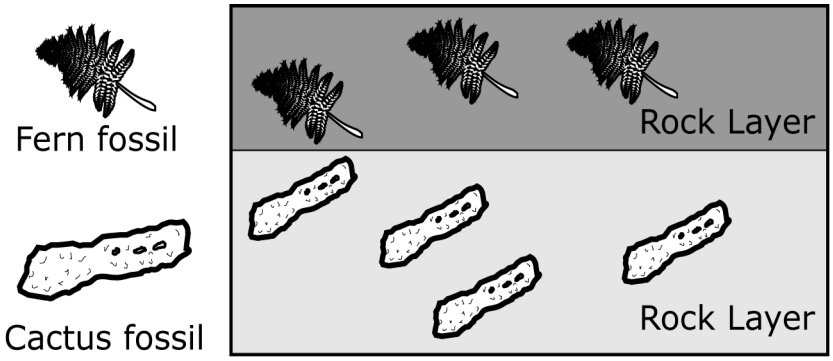

Ferns are plants found in areas with very wet soil, while cacti do not need much water at all to survive. Based on this information, it can be concluded that the area where these rock layers formed changed in what way?

a. Lots of plants changing to almost no plants
b. Cold and icy changing to very hot
c. Deep ocean changing to high mountain
d. Very dry changing to much more damp

4.1.4 Level 3

10. The tables provide information on plant and animal fossils.

Fossil	Description	Animal's Habitat
	Fish skull	Fresh water pond and lakes
	Mouse skull	Deserts
	Alligator toe bone	Marshes and swamps
	Shark's tooth	Deep ocean

Fossil	Description	Plant's Habitat
	Fern	Swamps, marshland
	Seaweed	Salt water
	Marsh grass	Beside fresh water
	Cactus	Deserts

Based on the information in the table, match which animal fossil and which plant fossil were likely found in the same layer of rock.

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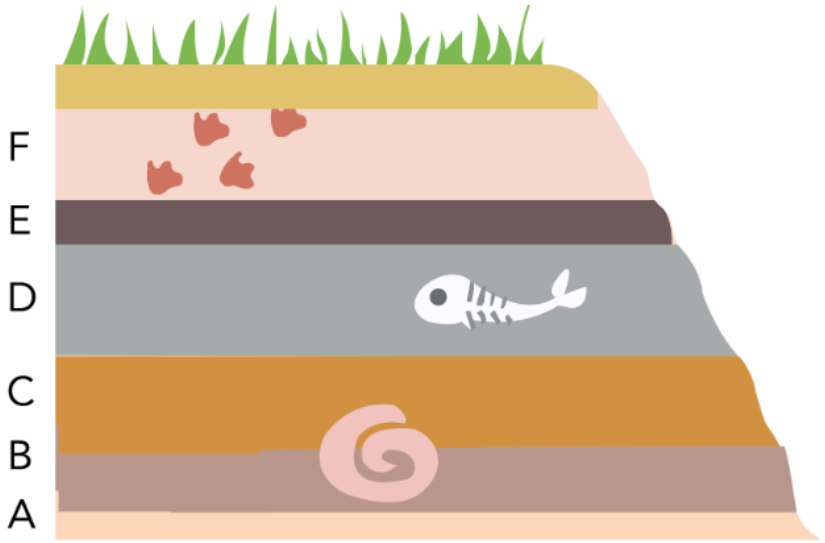
Animal fossil	Plant fossil	Why do you think these fossils were found in the same rock layer?
Fish skull	Marsh grass	They are both found near the marsh
Mouse skull	Cactus	They are both found in the desert
Alligator toe bone	Fern	They are both found in swamps and marshlands
Shark's tooth	Seaweed	They are both found in salt water.

11. A new interstate highway is being built! Construction workers, while making room for the new road, cut through the side of a hill. The drawing below shows what they observed.



Using evidence from the diagram, you will make 2 claims about how the environment has changed over time. You can use evidence from the layers of rock or fossils found in the rock layers.

	What do you observe or notice in the diagram? (evidence)	What does the observation tell us about the previous environments of the rock layers? (claim)

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1.	Seashell/Fish in layers A/D	There was first an ocean in this habitat.
2.	Footsteps in layer F	There was no longer an ocean since animals that leave footprints cannot live in the water and the footprints would not stay in a wet environment.

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Name: Rachel (25) Date: _____

4.1.3 Level 2

1. Fossils:

a. come only from dinosaurs and plants
b. are evidence of once living plants & animals
c. are evidence of once living animals
d. show us that animals never change

2. Use the words in the box and correctly fill in the blanks for how a mineral replacement fossil would be made.

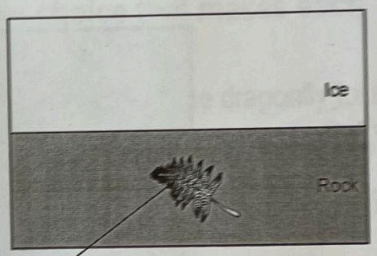
rodent eaten	minerals	sediment	erosion

An animal dies & its soft parts rot. The animal is buried by layers & layers of sediment. Over time the animal's hard parts are replaced by water filled with minerals. Weathering & erosion bring the fossil to the surface & uncover it to be found.

3. Below the ice in the arctic are rocks with fossils. Some fossils found there are of plants that only grow in warm places.

Finding this fossil can tell us what?

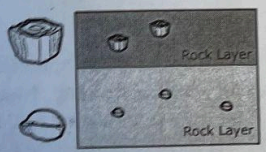
a. The land was not always a very cold area.
b. Some plants can grow in rock.
c. Rock is always covered with ice.
d. The arctic is not a very old place.



Fossil of warm-weather plant

4. The diagram shows one rock layer on top of another. The table shows the habitats of different plants and animals. Using this information, what was the order of habitats in this area?

a. Forest then seashore
b. Seashore then desert
c. Swamp then forest
d. Seashore then forest



Fossil	Identification	Habitat
	Tree	Forest
	Mouse skull	Deserts
	Alligator toe bone	Marshes and swamps
	Clam shell	Seashore

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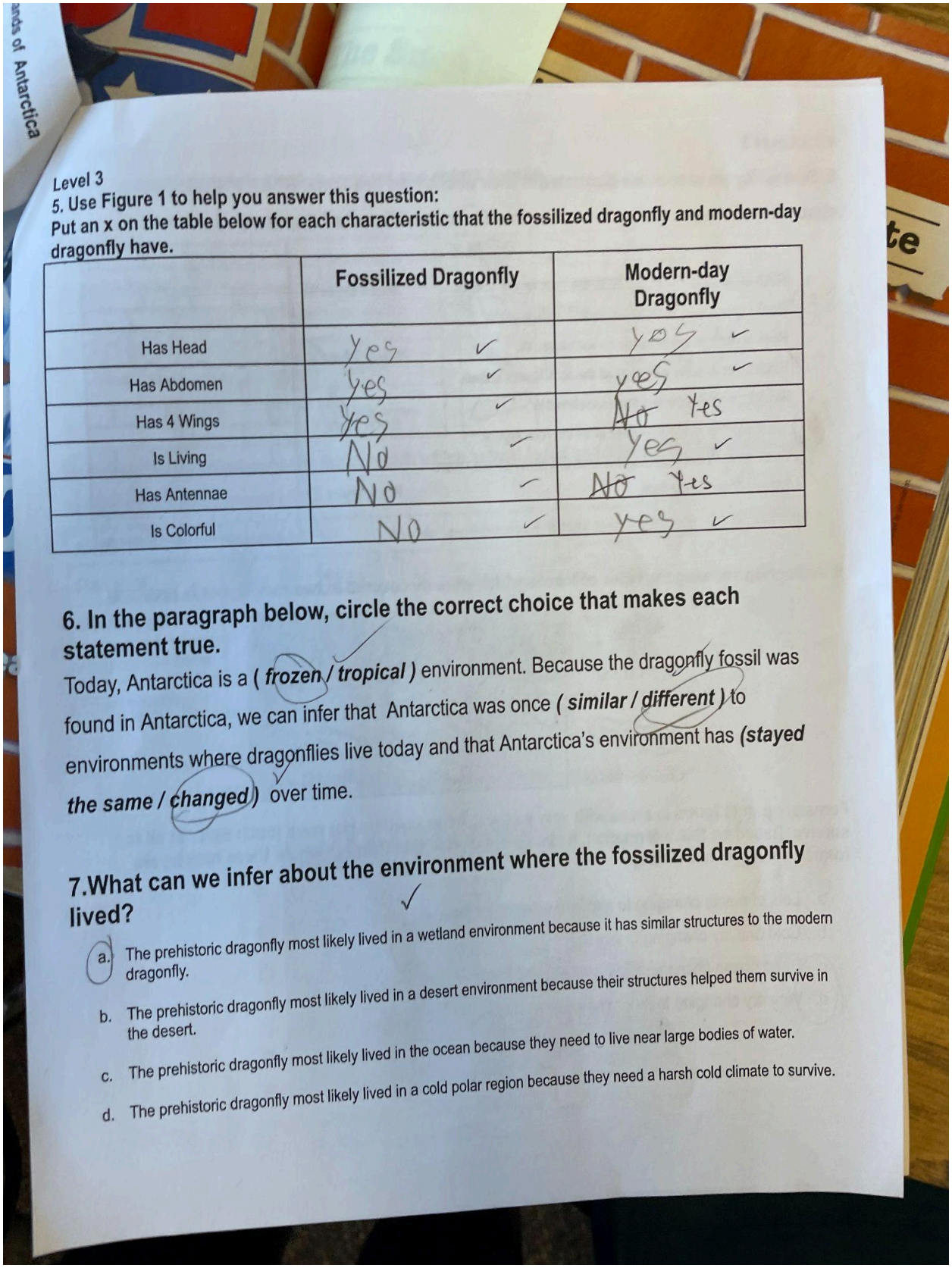

Level 3

5. Use Figure 1 to help you answer this question:
Put an x on the table below for each characteristic that the fossilized dragonfly and modern-day dragonfly have.

	Fossilized Dragonfly	Modern-day Dragonfly
Has Head	yes ✓	yes ✓
Has Abdomen	yes ✓	yes ✓
Has 4 Wings	yes ✓	~~No~~ Yes
Is Living	No ✓	yes ✓
Has Antennae	No ✓	~~No~~ Yes
Is Colorful	No ✓	yes ✓

6. In the paragraph below, circle the correct choice that makes each statement true.

Today, Antarctica is a (***frozen / tropical***) environment. Because the dragonfly fossil was found in Antarctica, we can infer that Antarctica was once (***similar / different***) to environments where dragonflies live today and that Antarctica's environment has ***(stayed the same / changed)*** over time.

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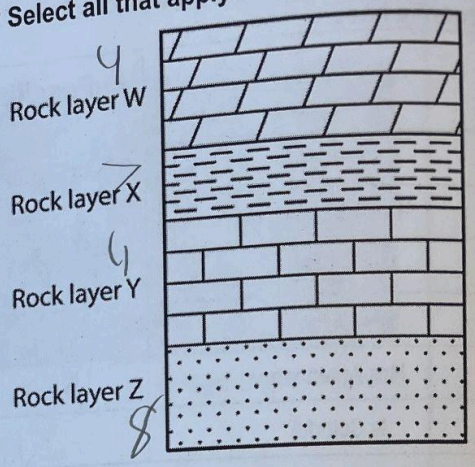
4.1.4 Level 2

8. Several layers of rock are illustrated in their unchanged positions. Which of the following conclusions is supported by the data in this illustration? Select all that apply.



a. Rock layer W is the oldest of all the rock layers shown.
b. Rock layer X was formed just before rock layer W.
c. Rock layer Y is twice as old as rock layer W.
d. Rock layer Z is the oldest of all the rock layers shown.
e. Rock layer Y is younger than rock layer W.
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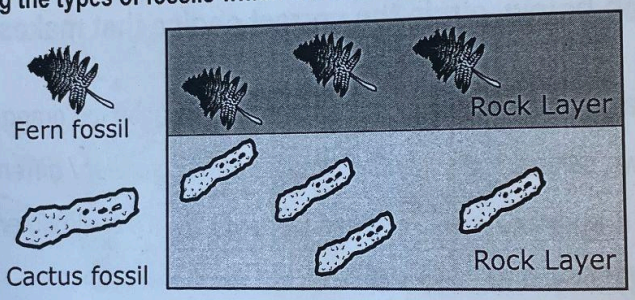
g. Rock layer W and rock layer Y look the same so they were formed at the same time.

9. A diagram showing the types of fossils which were discovered in two rock layers is provided.



Ferns are plants found in areas with very wet soil, while cacti do not need much water at all to survive. Based on this information, it can be concluded that the area where these rock layers formed changed in what way?

a. Lots of plants changing to almost no plants
b. Cold and icy changing to very hot
c. Deep ocean changing to high mountain
d. Very dry changing to much more damp

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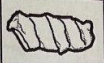
1.4 Level 3

10. The tables provide information on plant and animal fossils.

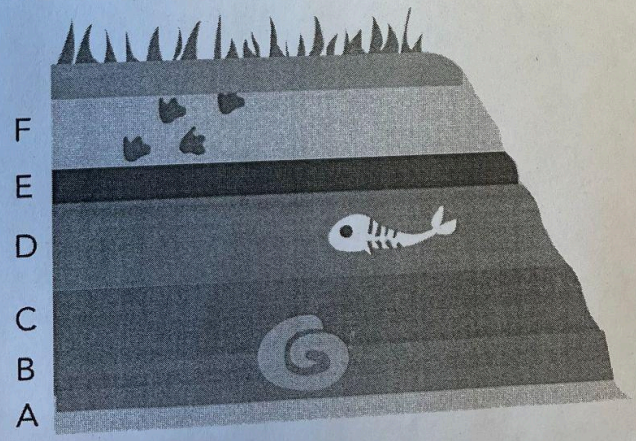
Fossil	Description	Animal's Habitat
	Fish skull	Fresh water pond and lakes
	Mouse skull	Deserts
	Alligator toe bone	Marshes and swamps
	Shark's tooth	Deep ocean

Fossil	Description	Plant's Habitat
	Fern	Swamps, marshland
	Seaweed	Salt water
	Marsh grass	Beside fresh water
	Cactus	Deserts

Based on the information in the table, match which animal fossil and which plant fossil were likely found in the same layer of rock.

Animal fossil	Plant fossil	Why do you think these fossils were found in the same rock layer?
Fish skull	Marsh grass	They both in the ocean
Mouse skull	Cactus	Both in the desert
Alligator toe bone	fern	fern alligator is in Swamp
Shark's tooth	Sea weed	both in Ocean

11. A new interstate highway is being built! Construction workers, while making room for the new road, cut through the side of a hill. The drawing below shows what they observed.



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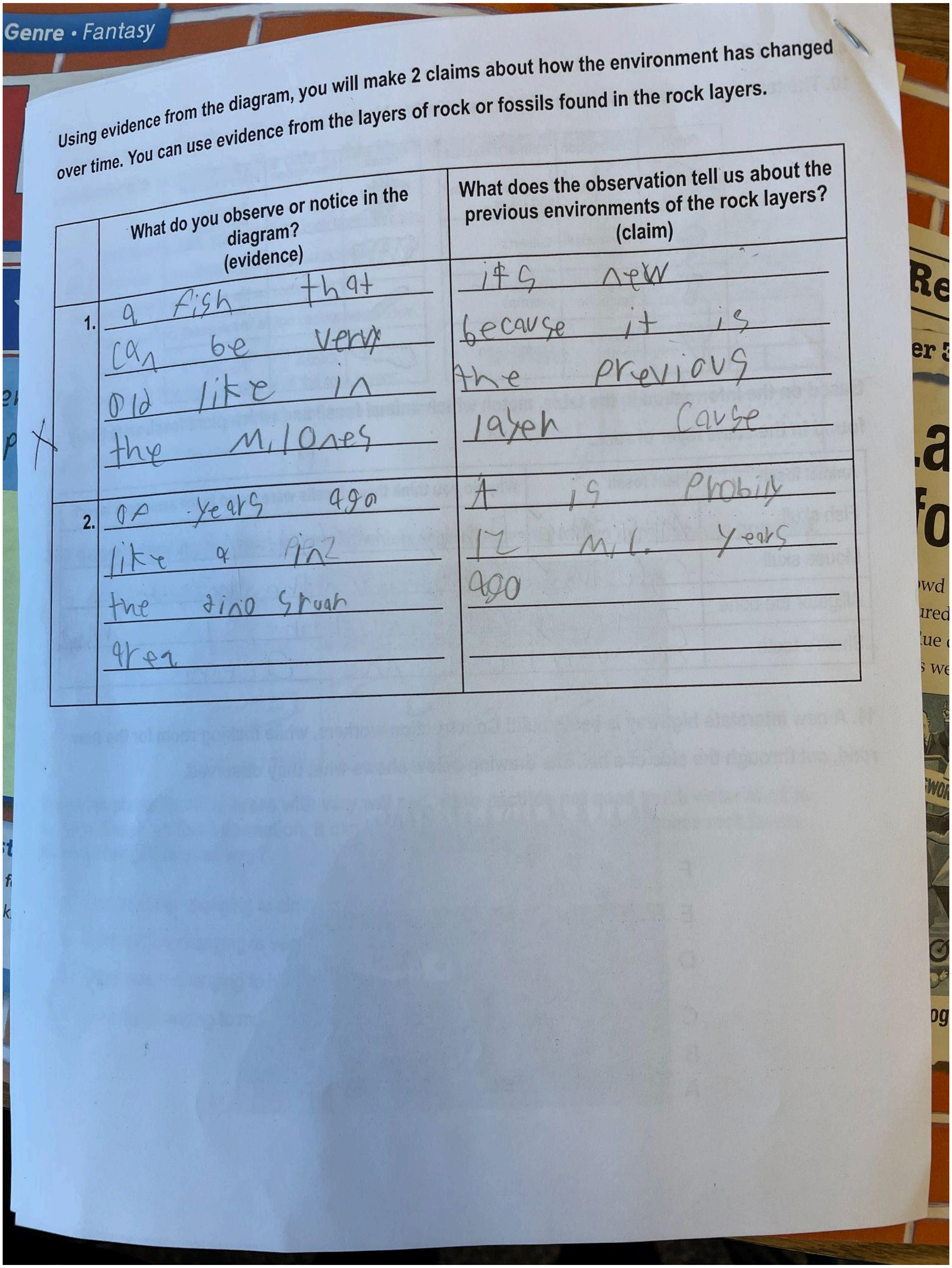


Using evidence from the diagram, you will make 2 claims about how the environment has changed over time. You can use evidence from the layers of rock or fossils found in the rock layers.

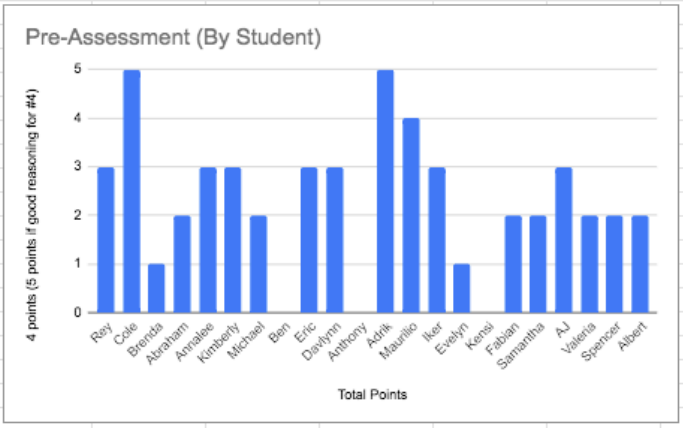
	What do you observe or notice in the diagram? (evidence)	What does the observation tell us about the previous environments of the rock layers? (claim)
1.	a fish that can be very old like in the milones	its new because it is the previous layeh cause
2.	of years ago like a dinz the dino shuah area	A is probily 12 mil. years ago

Student Data Collection

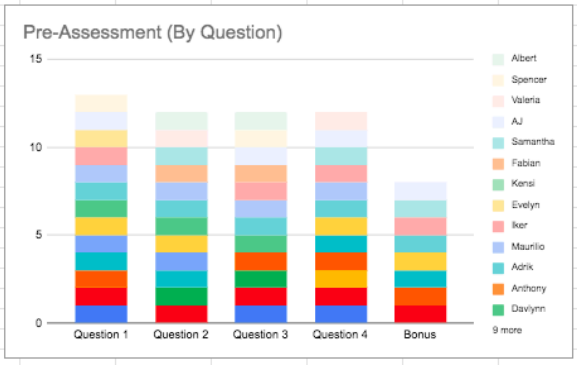
[Google Sheet: Fossils Unit Data]

The above linked google sheet shows the data collected for each lesson in the unit. Please see each tab in order to view the data I collected for individual lesson assessments.

Subject: Pre-Test	
Total Points	4 points (5 points if good reasoning for #4)
Rey	3
Cole	5
Brenda	1
Abraham	2
Annalee	3
Kimberly	3
Michael	2
Ben	0
Eric	3
Davlynn	3
Anthony	0
Adrik	5
Maurilio	4
Iker	3
Evelyn	1
Kensi	0
Fabian	2
Samantha	2
AJ	3
Valeria	2
Spencer	2
Albert	2



	Question 1	Question 2	Question 3	Question 4	Bonus
Rey	1	0	1	1	0
Cole	1	1	1	1	1
Brenda	0	0	0	1	0
Abraham	0	1	1	0	0
Annalee	1	0	1	1	1
Kimberly	1	1	0	1	1
Michael	1	1	0	0	0
Ben	0	0	0	0	0
Eric	1	1	0	1	1
Davlynn	1	1	1	0	0
Anthony	0	0	0	0	0
Adrik	1	1	1	1	1
Maurilio	1	1	1	1	0
Iker	1	0	1	1	1
Evelyn	1	0	0	0	0
Kensi	0	0	0	0	0
Fabian	0	1	1	0	0
Samantha	0	1	0	1	1
AJ	1	0	1	1	1
Valeria	0	1	0	1	0
Spencer	1	0	1	0	0
Albert	0	1	1	0	0
Total	13	12	12	12	8



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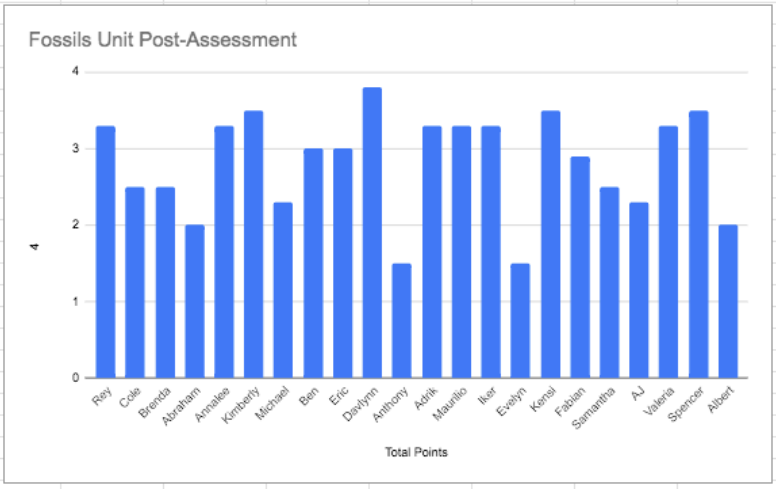
	Question 1	Question 2	Question 3	Question 4	Question 5	Question 6	Question 7	Question 8	Question 9	Question 10	Question 11
Rey	1	0	1	1	1	0.75	1	0.75	0	1	0.5
Cole	1	1	1	1	1	0.75	1	0	1	1	1
Brenda	0	1	1	1	0.75	1	1	1	1	0.5	0
Abraham	0	0.25	1	0	1	0.75	0	0.75	0	0	1
Annalee	1	1	1	1	0.75	0.75	1	1	0	1	1
Kimberly	1	1	1	1	1	1	1	1	1	1	1
Michael	1	1	1	0	0.75	1	1	0.25	0	1	0
Ben	1	1	1	1	1	1	0	0.75	1	0.5	1
Eric	1	1	1	0	0.75	1	1	0.75	1	1	0.75
Davlynn	1	1	1	0	1	1	1	0.75	1	1	1
Anthony	1	0	0	0	0.5	0.75	1	0	1	0	0
Adrik	1	1	1	1	1	0.75	1	0.75	1	1	1
Maurilio	1	1	1	1	1	0.75	1	0.75	1	1	1
Iker	1	1	1	1	1	0.75	1	0.75	1	1	1
Evelyn	1	1	1	0	0.5	0.25	0	0	0	0	0
Kensi	1	0.25	1	0	1	1	1	0.75	0	0.75	1
Fabian	1	0.5	1	1	1	0	1	1	1	1	1
Samantha	1	0.5	1	0	0.75	1	1	1	0	1	1
AJ	0	0.5	0	0	0.5	1	1	0.75	1	1	0.5
Valeria	0	1	1	1	1	0.75	1	1	1	1	1
Spencer	1	1	1	1	1	0.75	1	1	1	1	1
Albert	0	0	0	1	0.5	1	1	0.75	0	0	1
Total	17/22	16/22	19/22	13/22	19.25/22	17.25/22	19/22	15.5/22	14/22	16.75/22	16.75

Subject: Post-Assessment

Total Points	4	4.1.3	4.1.4
Rey	3.3	3.5	3
Cole	2.5	3	2
Brenda	2.5	3	2
Abraham	2	2	2
Annalee	3.3	3	3.5
Kimberly	3.5	3.5	3.5
Michael	2.3	3	1.5
Ben	3	3	3
Eric	3	3.5	2.5
Davlynn	3.8	3.5	4
Anthony	1.5	1.5	1.5
Adrik	3.3	3.5	3
Maurilio	3.3	3.5	3
Iker	3.3	3.5	3
Evelyn	1.5	2	1
Kensi	3.5	3.5	3.5
Fabian	2.9	2.7	3
Samantha	2.5	2.5	2.5
AJ	2.3	2	2.5
Valeria	3.3	3.5	3
Spencer	3.5	3	4
Albert	2	2	2



Post-Assessment Averages:

Mean= 2.8
Median= 3
Mode= 3.3

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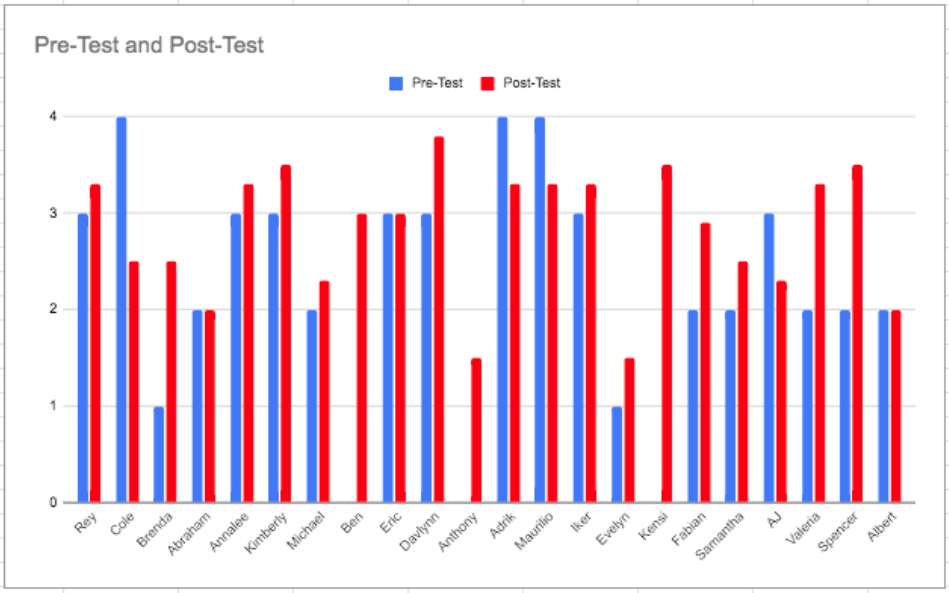
	Pre-Test	Post-Test
Rey	3	3.3
Cole	4	2.5
Brenda	1	2.5
Abraham	2	2
Annalee	3	3.3
Kimberly	3	3.5
Michael	2	2.3
Ben	0	3
Eric	3	3
Davlynn	3	3.8
Anthony	0	1.5
Adrik	4	3.3
Maurilio	4	3.3
Iker	3	3.3
Evelyn	1	1.5
Kensi	0	3.5
Fabian	2	2.9
Samantha	2	2.5
AJ	3	2.3
Valeria	2	3.3
Spencer	2	3.5
Albert	2	2



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Student Data Collection Analysis

From the data shown in the pre- and post- assessments, fourteen of the students showed growth, three students remained constant, and four students' scores decreased. This data shows me that while 64% of the students improved, a large number did not. That being said, the pre-assessment and post-assessment were rather distinct in rigor, rendering a true comparison difficult to make. For instance, the pre-assessment contained only four questions– all of which were multiple choice questions. Even two of the questions that contained the same stem, were asked in a different format in order to increase the difficulty. One example of this is question number two on the pre-test and question number 10 on the post-test. The pretest version simply asks students to identify the habitat in which a fossil is found–giving them four multiple choice options. Question 10 on the post-test, on the other hand, requires students to match two fossils together based on their habitats and explain why they matched the two.

Additionally, the pre-test consisted of four multiple choice questions while the post-test consisted of 11 questions. 5 of the post-test questions were multiple choice, 2 were a closed paragraph, 2 involved the filling out of charts, and 1 required paragraph answers. This kind of rigor is no doubt to enable students to be able to explain their understanding in a deeper manner which is something they would not have been able to do at the beginning of the unit. Thus, the testing fits the circumstances according to what the teachers expect students to be able to do before and after the unit and thus serve a very important purpose. However, as far as data collection, using the pre and post tests makes it hard to determine true student growth.

As far as individual students go, my data shows that I could have differentiated better for Tony,Evelyn, and Cole. These three students often work at a slower pace than other students.They also each have a harder time retaining information than the other students in the class do. I could have given these students additional support by working with them in a small group to review and discuss what was being learned while other students worked on their assignments individually or in partners. My observation has been with all three of these students that they learn the concepts well but need a little bit of extra guidance in making the connections and applying them. Additional practice in application of knowledge before the assessment would have also been very instrumental in helping these three students.

The data also demonstrates that the class overall scored lower on questions 2, 8, and 9 on the post-assessment. Looking back on these individual questions can help me to know what areas I would need to emphasize in the future. Question 2 asked students to fill in blanks in a paragraph about the fossilization process. A word bank was provided. Question 8 required students to observe a picture of rock layers and select all options that applied. Students needed to know the order in which rock layers form in order to answer this question correctly. Finally, question 9 showed a picture of two rock layers containing fossils. The first rock layer contained fossils from the desert and the second rock layer contained fossils from a damper area with ferns. In order to select the correct answer, students needed to be able to understand what kind of areas these fossils could be found in and the order in which the rock layers formed. Altogether, these

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questions helped me to understand that a greater emphasis on the fossilization process as well as rock layer formation would have helped my class to achieve the unit outcomes with greater success.

However, I am pleased to see that Kensi, Eric, and Davlynn all received 3's or higher on their assignments given that each of these students were absent for a significant portion of the unit. This is evidence that my efforts to differentiate for these students were effective. At the beginning of the lesson for each day in the unit, I reviewed what was learned previously. Furthermore, throughout the lessons, I tried to incorporate what was learned before so that students could see how each of the different things we were learning were connected. I also made efforts to check in with these students and work with them while students did individual assignments in order to help fill in any information gaps that had been caused by their absences.

In addition to the pre-and post- assessment data, the data gained from daily assessments helped me to adjust my lessons to meet the needs of my students throughout the unit. One instance of this was seen after the informational writing assessment. Through this writing piece, I was able to see that many of the students were still struggling to see how the environment of the watery cave had changed over time. Thus, I decided to expand the Mystery Science lesson of "What Did Your Town Look Like 1 Million Years Ago" into a larger investigation. In my lesson, I decided to use resources from the Utah Government Geology website in order to help my students see how Utah had changed. As part of this, students were required to make guesses of which fossils existed during which era of Utah's geological history using a map of Utah. I then had students imagine Utah, specifically Kearns, during these different eras and orally explain what they had learned. Doing so helped students to apply what they heard in the mystery science videos to their very own surroundings of Kearns, Utah. However, had I not looked closely at the data of the informational writing piece, I may not have decided that my students needed this extra reinforcement of the concept.

Overall, the data collected throughout the unit was instrumental in guiding my instruction through adjustments to individual lessons. Additionally, the pre- and post-assessments are helpful in guiding my instruction as I continue to teach these students and anticipate concepts that may be challenging for each one of them. If I were to teach this unit in the following year as a fourth grade teacher, I would make adjustments according to what I learned through the data collection I did with this class. Therefore, I would be sure to add additional support to practical application for lower performing students, emphasize the fossilization process and rock layer formation to a greater degree, and design a pre-assessment to better help me to assess individual student growth. These three areas would better help me to meet the needs of individual students and better meet unit objectives for the class as a whole.

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Unit Reflection

Teaching a unit on fossils has been both a lot of fun and a growing experience. I enjoyed seeing the process my students went through as they learned about how the earth has changed and what evidence we have of this change. It quite honestly thrilled me to see the faces of my students light up as they came to realize how the world around them looked at one point in time compared to how it looks now. For example, the students explained in their FlipGrid videos that Utah has changed throughout time. Many students explained that it was once covered in water, another time it was a forest, and is now a desert. Likewise, the day before they took the post-assessment, students responded to the question, "How do fossils provide evidence of how the earth has changed over time?" It was exciting to hear the students explain about how when we observe the fossils in each rock layer, we can learn about the habitat of the earth at the time that the rock layer was formed.

In many lessons of the unit students were led through a process of inquiry– using what they already know to make observations and questions about the world around them. In the first lesson, for example, students observed pictures and videos of an underwater cave in Mexico. Within this cave there were fossils, pieces of burnt wood/ashes, as well as footprints in the mud. In their first exposure to the underwater cave, students were given the opportunity to make a chart noting observations, predictions, and questions about what they were seeing. Students asked questions such as: "Has there always been water in the cave?", "Was there a volcano in the cave?", and "Did the animal whose fossils were found in the cave fall into the ocean?" Then throughout the unit, as we learned more and more about how the earth has changed, we came back to the phenomenon of the underwater cave. By the end of the unit, many students were able to confidently say that just because something is the way that it is now, does not mean it always has been that way. Thus, the underwater cave, with evidence of a forest habitat, has not always been underwater. The process of inquiry allowed students to unravel the story of the watery cave.

I also experienced some challenges at times while teaching the fossils unit. For example, there were times that I realized that students were not learning what I intended them to learn. When this happened, it was necessary to make adjustments to my unit in order to reteach concepts in a new way. One instance of this was while using the STEM Scopes cards in Lesson 4. At the conclusion of this lesson, students were required to place the cards for each habitat in distinct layers–representing the rock layers in which they were found. They were then supposed to say which layer they thought was the oldest and which layer they thought might be the youngest. As students were wrapping up with this lesson and I asked questions, I could see they were not understanding the concept that habitats can be determined based on the fossils found in rock layers. In fact, if I were to reteach this unit I think it would be better to preview sedimentary rock layers. However, given that we were in the middle of the unit, I found that I needed to make some adjustments to my lesson for the following day in order to reteach and reinforce the concept. I decided to use the "Earth's Landscapes" reading from Mystery Science to re-teach about rock layers. Additionally, I showed a video by PBS Learning about the Grand Canyon as

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reinforcement. Through this experience, I was able to learn the importance of being flexible and adaptable to the needs of the students in your class. There may be some concepts that need more attention than others. It is the work of the teacher to discern what these are, which of course is where formative assessments come into play. Using informal formative assessments such as listening to my students' partner conversations and class discussions helps a teacher to know how students are doing throughout the lesson. Then, more formal formative assessments help the teacher to know what learning gaps may need to be filled within the larger scheme of the unit. Collecting data and then making adjustments is key to creating a well-taught unit.

Another thing that occasionally caused some challenges during the teaching of the fossils unit was differentiation.Fall Break was scheduled for the middle of the unit. This meant that many students' families had planned vacations for the week leading up to Fall Break resulting in many absences in the class. Some students missed an entire week of instruction. I was then faced with the challenge of helping these students catch up with what we had learned while they were away while continuing to teach the rest of the class. All teachers are familiar with the balancing act of catering to the students that are behind while still challenging the students that are ahead. While I tried to work with these students when I could, rotating around the classroom when they worked individually or in partners, I think I could have still done a better job at this. As aforementioned in my student data analysis, I wish I had created a time where I could have worked with a small group of students that needed extra support. I had mentioned that I would have included Tony, Evelyn, and Cole in this group. It would have also been beneficial to include Kensi, Eric, and Davlynn, who were absent for a week, in this group. In the future, creating more opportunities for differentiation is an area in which I believe I can grow.

Finally, the last thing that I enjoyed learning about in this process was how to provide linguistic support throughout the unit. In the Dual Immersion program, we teach science in Spanish. Thus, being aware of challenging vocabulary words that the students would likely encounter as well as how I could scaffold the lessons for opportunities to improve language was critical. In many of my lessons, I included slides with pictures and examples of vocabulary words. I also included sentence frames to scaffold discussions both in partners and as a whole class. While language was not the focus of the unit, I found that it was an important part in creating a holistic understanding of the concepts taught.

Just as the earth is always changing, as students in Mrs. Ceballos' class learned, so are teachers. The best teachers are the ones who are always learning. Throughout the teaching of the fossils unit, I learned the importance of adaptability, assessments, differentiation, and linguistic scaffolding. I am eager to continue my teaching journey and to evolve as a teacher as I apply the things that I learned while teaching the fossils unit.

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