

Name _____ # _____ Date _____

Layers of Rock Lab

Concepts

- Sedimentary rocks form layers
- When deposited, younger (more recent) sedimentary rock layers sit on top of older rock layers (Law of Superposition)
- Sedimentary rock layers and time can be correlated
- Relative ages of rocks can be determined based on rock layer position.
- Relative ages of fossils within rock layers can be determined based on position.

Part 1

Materials

Package of taco seasoning mix
Can of refried beans
8oz cream cheese
16oz sour cream
16oz salsa
large tomato, chopped
large green bell pepper, chopped
1 bunch of green onions (scallions), chopped
1 small head of lettuce, chopped
6oz can of sliced black olives
2 cups of shredded cheddar cheese
plastic spoon
paper plate
tortilla chips

Procedure

1. In a medium bowl, blend the taco seasoning mix and refried beans. (your teacher may have already done this for you)
2. Mix the sour cream and the cream cheese in a medium bowl. (your teacher may have already done this for you)
3. Using the serving spoon, spread 2 spoonfuls of refried beans on your plate.
4. Using the serving spoon, place 3 olive slices in the refried beans on your plate.
5. Using the serving spoon, drop 2 spoonfuls of sour cream mixture on top of the bean mixture. Use your spoon to spread this mixture over the refried beans.
6. Using the serving spoon, drop 2 spoonfuls of salsa on top of the sour cream mixture. Use your spoon to spread this mixture over the sour cream mixture.
7. Place a layer of tomato, green bell pepper, green onions, and lettuce over the salsa (in that order).
8. Top this with cheddar cheese.
9. Using the tortilla chips, excavate these layers and answer the following questions. (You may eat as you excavate if you choose but don't eat it all until you are done with the questions in Part 1)

Define (you may want to use the internet or a text book to help you with several parts of this lab)
Law of Superposition (of rock layers):

Intrusion:

Extrusion:

Questions:

Based on the orientation of the rock layers on your plate

1. _____
Which layer of the dip was the oldest?

Explain _____

2. Which layer of the dip was the youngest?

Explain _____

3. Which layer is older the tomatoes or the green onions?

4. What do the olives represent?

5. Are the olives younger or older than the sour cream layer?

6. Make a list of the layers from Youngest to Oldest (not including the olives)

Youngest

Oldest

7. If somebody in your class was allergic to sour cream and did not put that layer on their plate, would you be able to tell the age of the olives? Explain your answer.

8. Look up the words weathering and erosion, what in this lab represents weathering?

9. What represents erosion?

Part 2

Problem

Last spring, a team of geologists made a study of the rock layers exposed on the side of a cliff. Here are the notes one of the geologists made.

"On this cliff, we can see six layers of sedimentary rock. There is an extrusion between the third and fourth oldest layers. Through dating a sample of that rock, we determined the extrusion to be 250 million years old. An intrusion extends from the bottom layer into the fourth oldest layer. Through dating a sample of that rock, we determined the intrusion to be 100 million years old. We also looked for fossils. In the three oldest layers, we discovered fossil trilobites. In the second and third oldest layers, we found fossils of fishes.

We found reptile fossils in the third oldest layer and the layer above it. In the younger layer that had a reptile fossil, we also discovered a dinosaur fossil. We found bird fossils in the second and third youngest layers. Most interesting was the fossil from a whale we found in the youngest layer."

This geologist needs a drawing for the final report that shows what the team found. How can you make a drawing from the geologist's notes?

Procedure

1. Make a list of every feature the geologist found that could help you make a drawing of the site.
2. In the area below, make a drawing from your list. Label the sedimentary rock layers A–F, from oldest to youngest.
3. Create a key that tells what symbols you used on the drawing.

Suggestions to make this easier:

- draw the sedimentary rock layers first, then add the extrusion and intrusion, and finally add symbols for the different types of fossils.
- make your own symbols for the fossils as long as each symbol is identified in the key.

Analyze and Conclude

Answer the following questions on a separate sheet of paper.

1. Which rock layer is the oldest? Explain how you know.

2. How did the geologists probably date the extrusion and intrusion? Explain.

3. Why didn't the geologist include dates in the notes for the sedimentary rock layers?

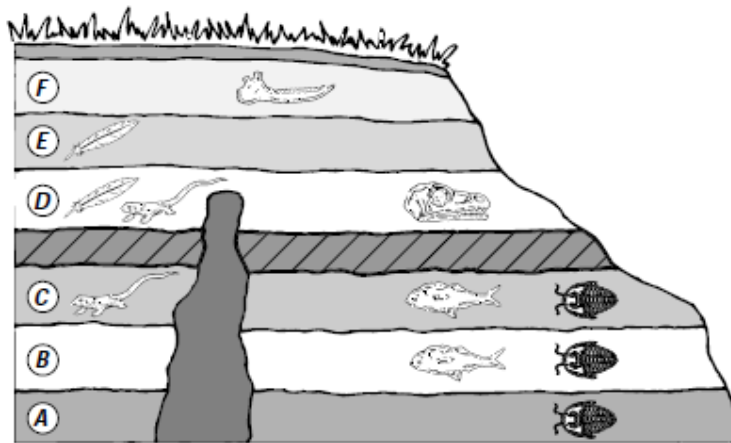
4. What is the age of sedimentary rock layer D? Explain how you determined its age.

5. By inferring from the fossils in layer B, could this rock layer have been deposited in the Cambrian Period? Why or why not?

6. By inferring from the fossils in each layer, describe a major event in the history of life on Earth that occurred at about the time of the extrusion.

7. In which era was layer F deposited? How do you know?

ANSWER KEY



Key			
	Reptile		Dinosaur
	Trilobite		Whale
	Fish		Extrusion
	Bird		Intrusion