

Core Sample Cake (Igneous, Sedimentary and Metamorphic Rocks)



Objective:

To use the Law of Superposition and the Law of Fossil Succession to identify simulated rock layers in this model

Materials:

1. 3 boxes of cake mix 1 chocolate and two yellow or white and the ingredients to make the cake batter
2. 30" X 18" baking pan
3. 8" pie pan
4. Food coloring
5. Rainbow and chocolate sprinkles or poppy seeds and sesame seeds
6. Green colored sugar and decorations for a beach scene cake
7. Large straws
8. 10 inch bamboo skewers
9. Cake knife
10. Paper and pencil to record your findings

Procedure:

1. **Tilt** large baking pan at a approximately a 30 degree angle
2. Prepare chocolate cake mix using package directions and pour 2/3 of the batter into the tilted large baking pan
3. Pour 1/3 of the chocolate cake batter into the pie pan(follow package directions for pan preparation)
4. Follow the package directions to make the two white cake batters and separate the batter in four bowls.
5. Pour the grey batter in thin layers over the chocolate layer until the chocolate batter is all covered
6. Add rainbow sprinkles to the grey batter
7. Using food coloring dye one part orange(yellow and red), another part grey (blue, red and green) , the third part brown (yellow, red and one drop of green) and leave the last bowl filled with white batter
8. Pour in the peach colored batter and add chocolate sprinkles
9. Pour the white batter on top of the peach and **level the pan**
10. Pour the chocolate batter on top
11. Bake according to the package directions and cool baked cake completely
12. Color 2/3 of the white frosting blue-green for the ocean
13. Color 1/3 of the white frosting peach for sand and leave 1/3 white for waves
14. Set the cake in the round pie tin at one end of the sheet cake. Trim id necessary to look like an island.
15. Ice the island cake with chocolate frosting (rich volcanic soil)
16. Add peach frosting for the beaches on the island edges

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17. Frost the sheet cake with your blue frosting for the ocean
18. Add white frosting white caps and breakers for the waves
19. Add green sprinkles for vegetation and decorations on the island
20. Have the students draw a colored diagram of the cake(s)

Observations:

Making your coring tool:

1. Cut the straws so the straw is inch higher than the cake
2. Each students needs a straw, a bamboo skewer and a napkin
3. Insert an open end of the ticker straw into a part of the cake
4. Pull the straw out of the cake
5. Place the straws over a paper plate or napkin and push the flat end of the skewer down to extract your cake core sample onto the plate
6. Draw and describe the cake layers- **series of stripes of different colored cake**
7. using your straw set up, extract at least three samples from different parts of the cake
8. Draw and describe each core sample label where each was found on the cake- **tilted layers and one with sprinkles or poppy seeds**

Analysis:

1. Using the Law of Superposition label the layers in the core samples form youngest to oldest. **Youngest layer at the top and the oldest at the bottom**
2. Which layers contained fossils? **The rainbow sprinkles(or poppy seeds) are Trilobite fossils and the chocolate sprinkles (or sesame seeds) are shell fossils**



(These 85 million year old shells remain in almost their original condition)

3. Using the Law of Fossil succession, which fossil layer is older? **Fossils are “the remains or traces of prehistoric life.” Shells can be preserved without being petrified for millions of years. The fossils found in the lowest level would be older and precede fossils of species in higher levels. The Law of Fossils succession states “fossil organisms succeed one another in a definite and determinable order and therefore, any time period can be recognized by its fossil content.” For example the Trilobite is an index fossil of the Paleozoic Era. They are found in rocks from dating from 490 million years ago to 248 million years ago. Knowing the species of trilobites would help a paleontologist determine in what geologic period the rocks with the rainbow sprinkles were formed. Explain**

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- why. Paleontologists have collected fossils from layers of rock around the world to establish the geologic time scale.
4. What do the Trilobite fossils found on the island tell you about the geologic past history of this island? Since trilobites were ocean creatures that burrowed in the mud this island was probably under the sea in the Paleozoic Era. The Cambrian period is called the “golden age of the trilobite since over 600 different types are found in rocks of this time. Perhaps the rocks that form this island are 500 million years old.
 5. Compare your samples do any of them show unconformities? Unconformities are deformations in the layers of rocks deposited on earth. There are angular unconformities where layers have been tilted, folded or even overturned. The rocks do not exhibit the Law of Succession in that older rocks have been moved above younger ones. Disconformities are an unconformity where a missing layer in the rock strata. The layer may be missing due to erosion or perhaps the lack of deposition of sediments at that time. Disconformities are often only identified when the missing layers are observed in another location. Explain why? Student’s results may vary but they should be able to identify tilted layers and missing layers if they compare samples from different parts of the cake.

Follow-up:

Cut open the cake and look at the layers. Describe what might have been happening during the geologic past in your piece of cake. Note any intrusions, missing layers and tilting.

Enjoy eating your cake.

Cake Layer Key:

Chocolate = granite

White = shale

Chocolate sprinkles = shells

Grey = slate

Brown = sand

Island = basalt

Peach = sandstone

Blue frosting = ocean

Chocolate frosting = top soil

Peach Frosting = beach sand

Green sparkles = low tropical plants

Rainbow sprinkles = Trilobites