

Name _____ Date _____ Period _____

RELATIVE AGE OF ROCK!

Directions – complete the following activities to help you learn more about how scientists find the “relative” age of rocks.

Activity 1 – The Law of Superposition?

The law of superposition was formulated back in the 17th century by Danish scientist Nicolas Steno. He attributed the formation of most older layers of rock to the great flood mentioned in the Bible, and used the law of superposition to establish an interconnection between the rocks that he believed to have been formed before the flood and the ones that he thought had formed after it. This was the first use of superposition for differentiating the time periods in the Earth's History.

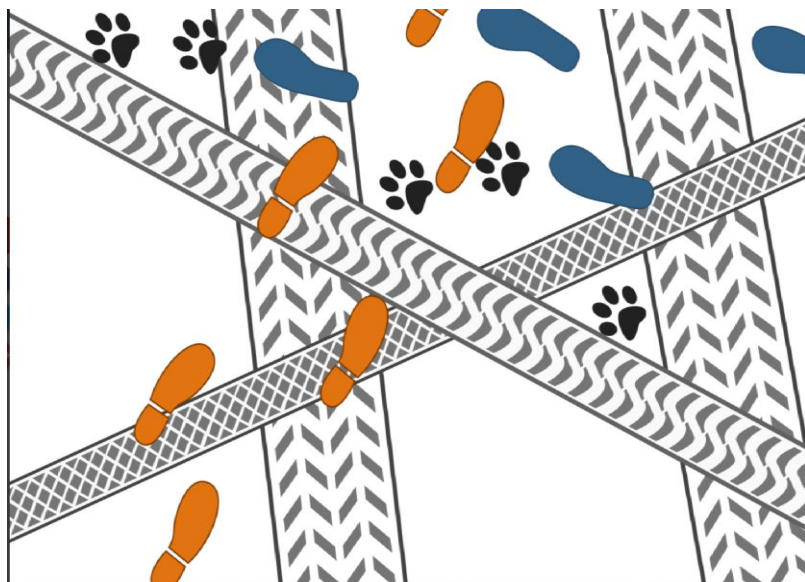
Definition of the Law of Superposition: In an undisturbed collection of sediment or rock; the layer on the top is the youngest layer, while that at the bottom is the oldest. For instance, if in a given sample, a layer of limestone is present on top of a layer of shale stone, then the limestone layer is the younger of the two.

From this definition, it is clear that the law of superposition is concerned with the different layers of the Earth, and their respective ages (younger, oldest etc). It helps in the determination of the age of a particular layer of earth, relative to the ages of the layers that are above and below it.

1. Who formulated the law of superposition?
2. What is a synonym for the word formulated?
3. According to the law of superposition, where is the youngest rock located?
4. According to the law of superposition, where is the oldest rock located?
5. In your own words, describe how the law of superposition explains the “relative” age of rocks in rock layers.

Activity 2 – Can You Figure it Out?

Directions – Use the image below to help you solve the mystery.



Clues:

- The owner of the house drives a car.
- The maid rides a bicycle to work.
- The cook rides a motorcycle.
- The butler walks to work.
- The neighbor has a dog, and visits often.

Analysis Questions:

6. How can you use the law of superposition to identify the culprit?
7. Who is the culprit?

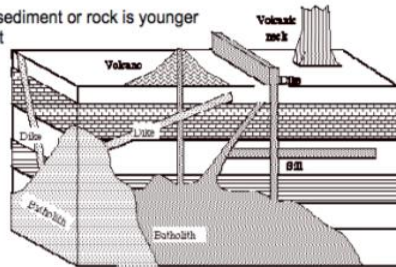
Activity 3 – The Other Laws

The Cross-Cutting Law

Any feature that *cuts across* a body of sediment or rock is younger than the body of sediment or rock that it cuts across.

NOTE:

- A **fracture** is a crack in rock.
- A **fault** is a fracture along which movement has occurred.



8. What is the cross-cutting law?

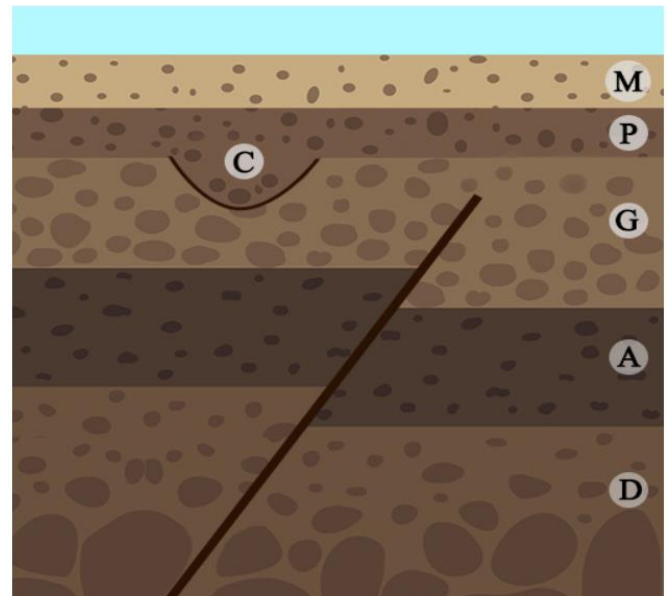
9. What is a fracture?

10. What is a fault?

11. What caused the brown semi-circle line at point C?

12. Is the dark diagonal line showing a fault or a fracture? How do you know?

13. List the layers in order from oldest to youngest.



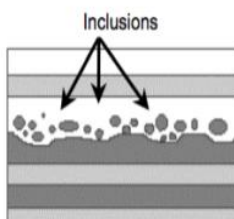
Hints:

The dark diagonal line was created by an earthquake

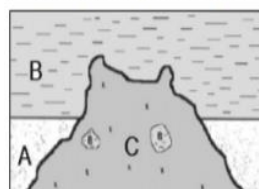
A river created the semi- circle at location C

The Law of Inclusions

If one rock body contains fragments of another rock body it must be younger than the fragments of rock it contains. OR...The inclusions are older than the rocks which contain them.



Inclusions of B are older than C.



14. Describe the law of inclusions?

Activity 4 – Putting it all together



15. Circle the correct order for the fossil skulls in order from youngest to oldest?

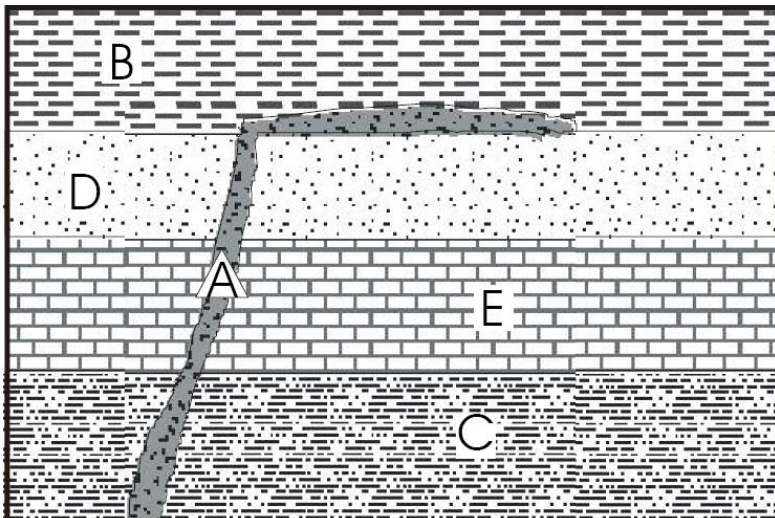
- a. W, X, Z, Y
- b. Y, Z, X, W
- c. X, W, Y, Z
- d. Z, Y, X, W

16. If artifact 6 is 600 years old, how closely can we approximate the date of artifact 7?

- a. They are similar in age because they are in the same layer
- b. Artifact 7 is slightly younger because the layer above is more shallow
- c. Artifact 7 is slightly older because it's buried deeper
- d. Artifact 6 is older because the artifact is darker

Activity 5 – Relative Dating Practice

Look at the following drawings, and then use the relative age laws (principles) to determine the age relationships. Typically, geologists will list the age order of rocks from top to bottom, with the oldest rocks at the bottom and youngest at the top (like the principle of superposition).

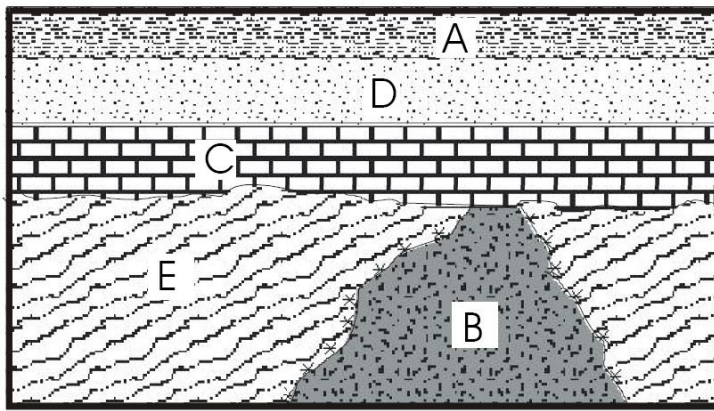


Youngest _____

Oldest _____

17. List the law(s) (principles) you used to determine the age relationships:

- a.
- b.



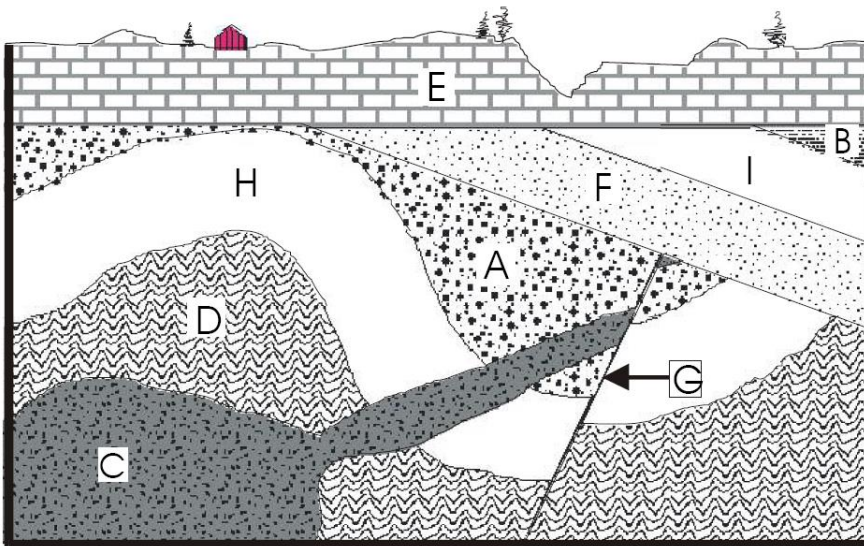
Youngest _____

Oldest _____

18. List the law(s) (principles) you used to determine the age relationships:

a.

b.



Youngest _____

Oldest _____

19. List the law(s) (principles) you used to determine the age relationships:

a.

b.

c.

20. In your own words, describe how to find the relative age of rock. (Full points for full sentences)