

ENERGY AND EARTH'S SURFACE STUDY GUIDE

Parent Signature (3 % extra credit on test)

I have gone over this study guide with my student for at least 30 minutes.

Signature—no initials please

Weathering and Soil

1. What is weathering?

The breaking down of rocks.

2. What is mechanical weathering? What are three ways mechanical weathering can happen?

Physically breaking rocks, no chemical reactions. Plant roots, abrasion of wind/water, temperature changes

3. What is chemical weathering? What are three ways chemical weathering can happen?

Breaking down rocks using chemical reactions. Plant acids, oxidation, acid rain

4. Identify these examples of weathering as mechanical or chemical:

rusting, ice breaking rocks, water, sulfuric acid eating rocks, roots breaking up rocks

C

M

C/M

C

M

5. What are the three factors that affect how fast a rock will weather? (they're in your notes)

Type of rock, climate, surface area

6. What are the 5 layers of soil from top to bottom?

Litter, topsoil, subsoil, weathered parent material, bedrock/parent material

7. Describe what happens to the amount of humus and the amount of weathering in soil layers as you go deeper.

The amount of humus decreases and so does the amount of weathering

8. Why could soil possibly be missing one or more layers?

Erosion could take a layer away, the soil may not be old enough, there may be no plants to make litter

9. What is humus? Why is it important?

Humus is the decaying organic material in soil. It is important because it provides nutrients for plants.

10. How do plants and animals help to create and change the soil? **Name three ways.**

Plants- roots break up rocks, they add to the soil when they die/drop leaves, they hold the soil in place

Animals- add materials to the soil, stir up the soil, some of them help to break down and decay materials

Erosion

1. What is the difference between weathering and erosion?

Weathering breaks down rocks, erosion moves them

2. What is the process called when eroded sediments settle or land in a place?

Deposition

3. What are the 5 agents of erosion and deposition?

Wind, water, waves, glaciers and gravity (the 3 W's and 2 G's)

4. Name three landforms created by gravity and be able to identify them.

Slump, creep and landslides

5. Name the **erosional** and **depositional** land forms created by running water and know what they look like.

Erosional—*v-shaped valleys, meanders, caves*

Depositional—*deltas*

6. Name an erosional and a depositional landform created by wind and know what they look like.

Erosional—*mushroom rocks*

Depositional—*sand dunes*

7. Name the three land forms created by glaciers and know what they look like. Are they made by erosion or deposition? *Cirque, U-shaped valleys, horns*

8. Name the **erosional** and some **depositional** land forms created by waves and know what they look like.

Erosional—*sea arches and sea stacks*

Depositional—*beaches and spits*

9. Weathering, erosion, and deposition are responsible for creating which one of the three main types of rock?
sedimentary

10. Name four forms of energy that help make erosion, weathering and deposition possible.

Chemical, mechanical, gravitational, heat

11. Name one rapid change that erosion or deposition could create.

A landslide

12. Name one very gradual change that erosion or deposition could create.

creating a valley, forming a cave, making a beach

Fossils and Earth's Past

1. What is the Law of Superposition?

Rock layers should get older the deeper down they are

2. What is relative dating?

Estimating how old a rock layer is compared to others using superposition and index fossils

3. What is an index fossil? How do you know that an organism would make a good one?

A fossil that lived for a short time. It should only be in one rock layer.

4. Name three things that could make the Law of Superposition incorrect.

Earthquakes (faulting and folding), volcanic activity, erosion

5. Which types of environments would the following rock types be formed in:

Limestone-*deep ocean*

Sandstone- *beach*

Shale- *deep ocean*

Coal- *forest/swamp*

6. What is a fossil? *Preserved remains or evidence of a living thing*

7. Name the four ways fossils commonly form and give an example of each.

Mineralization—petrified wood and dinosaur bones

Imprints—Leaves and feathers falling into mud

Molds and Casts—trilobites and sea shells

Preserved remains—amber, tar pits, frozen organisms

8. What are trace fossils? Give two examples.

Fossils that don't show part of a living thing. Nests, trails, scat.

9. What are body fossils? Give two examples.

Fossils that show what an organism or parts of an organism looked like. Leaf imprints, mineralized bones.

10. Explain the difference between a mold and a cast.

A mold is the hole left by the body, the cast is the fossil created when the hole is filled with new sediment.

11. Which three factors will affect whether an organism becomes a fossil or not?

Where the organism dies, if it has hard body parts, how quickly it is buried

12. Give three **general** reasons why we don't find more fossils.

Many things don't become fossils (see question #11), the fossils get destroyed by the Earth, many fossils are located in places we won't find them

13. Name three things that studying fossils can tell us about what the Earth was like in the past (not in your notes, use your brain for this one).

What used to live on Earth, how things have changed over time, what the environment was like in the past

14. How old do scientists estimate the Earth to be? *4.6 billion years old*

15. List the four eras in the Earth's history divided up into from oldest to youngest.

Precambrian, Paleozoic, Mesozoic, Cenozoic

16. List three developments that occurred during the Precambrian time.

Oceans formed, rocks formed, life began, bacteria and jellyfish developed

17. List three developments that occurred during the Paleozoic.

Pangaea formed, fish, plants and reptiles formed. A huge variety of life developed.

18. List three developments that occurred during the Mesozoic.

Dinosaurs ruled the Earth, mammals, flowers and birds developed.

19. List three developments from the Cenozoic.

Humans came about, mammals thrived and developed into larger varieties, the last Ice Age

20. The geologic timeline is split into eras and the eras are split into periods. How do geologists decide where to split the timeline into these eras and periods?

Based on major developments/events in life.

21. Place the following in order of development: reptiles, rocks, birds, land plants, fish, humans, bacteria

rocks, bacteria, fish, plants, reptiles, birds, humans

20. How long have humans been on the Earth compared to other organisms? How much room do we take up on the timeline?

We have been on Earth for just a small blip of time. We would be microscopic on a timeline.

Application Section

Figure 1

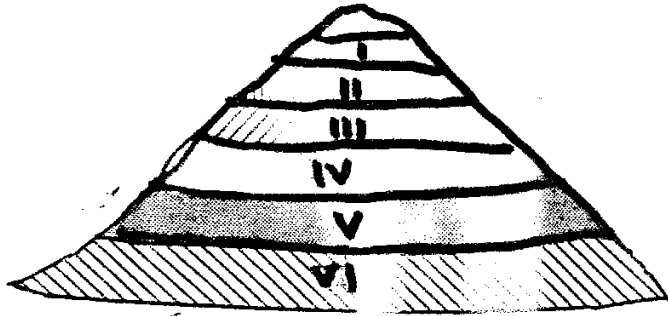
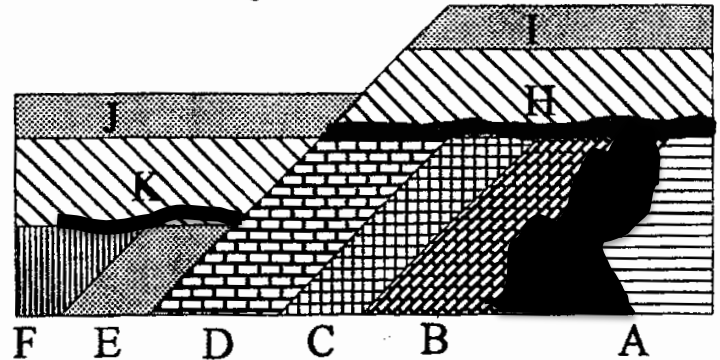


Figure 2



1. Which layer would you assume to be the oldest in Figure 1?

VI, it's on the bottom

2. (Figure 1) Layer III is coal and layer IV-VI are limestone. This suggests that the environment changed from:

- a. ocean to lake b. lake to beach **c. ocean to forest** d. forest to ocean

3. (Figure 1) To search for fossils of sea creatures, paleontologists would examine:

- a. each layer **b. the lower 3 layers** c. the upper 3 layers d. the middle layers

4. What event would you assume happened at the area labeled by the heavy black line in Figure 2?

- a. erosion b. earthquake c. folding **d. volcanic activity**

5. What event probably created the offset of layers J and I?

An earthquake (faulting)

6. Which layer would you assume to be the oldest in Figure 2?

Layer A. It would be on the bottom if the layers weren't tilted so much.

7. Figure 2 has evidence of how many earthquakes? Justify your answer.

At least two. The first one caused the bottom layers to tilt, the second one caused the fault that offset the layers.

8. Why are layers H-K not tilted?

They came after the earthquake that caused the tilting of the bottom layers

9. About when did the volcanic eruption occur in Figure 2?

After Layers A-E were created AND after the first earthquake, but the eruption was BEFORE the second earthquake because the lava layer is broken.