

Lithosphere Test Review #2

Name: _____

1. Physical weathering changes the Size of rocks. Chemical weathering changes the Composition of rocks. Which type of weathering increases rock surface area?

Physical and chemical

2. Match the 7 types of **physical weathering** to their definitions

- 1) Frost Wedging **C**
- 2) Abrasion **A**
- 3) Plant/Animal Activity **F**
- 4) Gravity/Pressure **G**
- 5) Wetting/Drying **E**
- 6) Exfoliation / Joint Sheeting **D**
- 7) Thermal Stress **B**

- A. Scraping of the surface particles during their transport by wind, glacier, waves, gravity, running water or erosion.
- B. Heating up and cooling down makes rocks swell and shrink until they break.
- C. freezing and thawing of water in cracks disintegrates rocks.
- D. Reduced pressure caused by "unloading" on igneous rock causes it to expand and allows slabs of outer rock to break off in layers.
- E. Wetting and drying causes clay minerals to expand and contract, and salts may dissolve and re-precipitate.
- F. The activity of organisms, including plants, burrowing animals, and humans, can also cause mechanical weathering.
- G. Bedrock is under pressure from overlying rock. When overlying rock layers are removed, the pressure on bedrock is reduced and it expands and cracks.

3. Name the 5 types of **chemical weathering** that match these descriptions.

- a. The chemical reaction of oxygen with other substances (rust) = Oxidation
- b. Carbonic acids dissolve rocks and can form caves = Carbonation
- c. Pollution from factories dissolves in rainwater and eats away rocks and buildings = Acid rain
- d. Decaying plant material mixes with water forming acid or lichens use acid to dissolve the rocks they form on = Plant acids
- e. Water causes silicates and oxides to undergo chemical decomposition = Silicate weathering

4. List 3 human activities that cause **acid rain** to form?

- a. **Burning of fossil fuels**
- b. **Transportation**
- c. **Industry**

5. What is one natural cause of acid rain? **Volcanism**

6. The movement of sediment, rocks, and gravel from one location to another is called Erosion.

7. What are 4 things that can cause erosion?

- a. Water
- b. Wind
- c. Ice
- d. Living organisms

8. The process that drops off soil, rocks, and gravel in a new location, such as a river delta or a glacial moraine is called Deposition.

9. What are the 5 characteristics that define a **mineral**?

- a.
- b.
- c.
- d.
- e.

10. Compare and contrast **extrusive** and **intrusive** igneous rocks.

- How are they alike:
- How are they different:

11. Describe how **sedimentary rocks** form.

12. Describe how **igneous rocks** form.

13. Describe how **metamorphic rocks** form.

14. What type of rock is the Grand Canyon made of? How can you tell?



15. Marble is formed when limestone gets buried and changes under high heat and high pressure. What type of rock is marble?

16. Which rock layer in this picture is the oldest? What type of rock is it? (Hint, it is the only type that fossils can be found in.)



17. How does the sun help drive the rock cycle? List 3 processes from the rock cycle that the sun influences.

- a.
- b.
- c.

18. Why is salt considered a mineral but sugar is not?

19. What are the two main types of mining?

Surface mining and Underground mining

20. Which type of mining is more environmentally damaging? Why?

Surface mining because it involves a larger area and removes plants, soil and other organisms

21. What is reclamation and why is it important?

Attempting to return the land to what it was before the mining process. It helps to limit the environmental impacts.

22. Describe how the movement of tectonic plates is linked directly to the rock cycle. Be sure to use the term subduction in your answer.

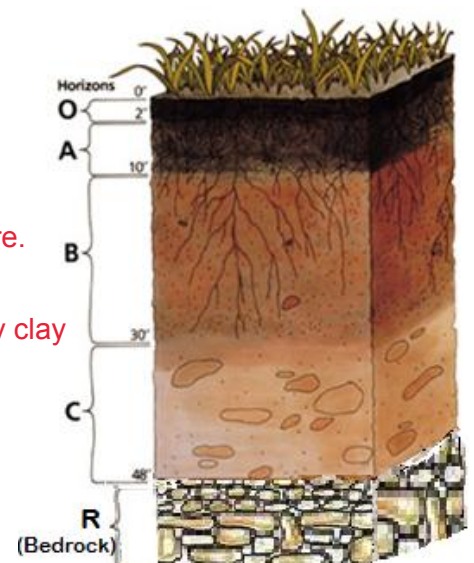
23. Describe the characteristics of the parts of the soil profile to the right.

O: Organic material high in nutrients, dark color, carbon rich.

A: Topsoil that contains nutrients to support plant growth, roots found here.

B: Subsoil that collects small fragments leached from the surface, mostly clay

C: Weathered rock that has been broken up from parent material or transported by erosion



24. How is **soil texture** classified? % Sand, % Silt, and % Clay

25. If a soil has 40% sand particles, 40% silt particles, and 20% clay particles, which soil texture class does it belong to? Loam

26. What is the difference between **residual** and **transported** soil? Which one is there more of in the world, residual or transported soil?

Residual is formed without erosion, transported is carried by erosion to the location where it accumulates.
Transported is more abundant.

27. Define **humus**. How does it form? What color is a soil that has a lot of humus in it?

Humus is material rich in organic content (carbon) that provides vital nutrients for plant growth. Usually a dark brown/black color.

28. Rank the 3 soil particles in term of size from smallest to largest.

Clay, Silt, Sand

29. What element is responsible for giving our soil its characteristic red/orange color here in NC?

Iron

30. Big pore spaces between soil particles are called Macropores. Small pore spaces between soil particles are called Cryptopores.

31. What is permeability? Ability of water to pass through.

32. The more sand particles in a soil, the greater its permeability.

The more clay particles in a soil, the lower its permeability.

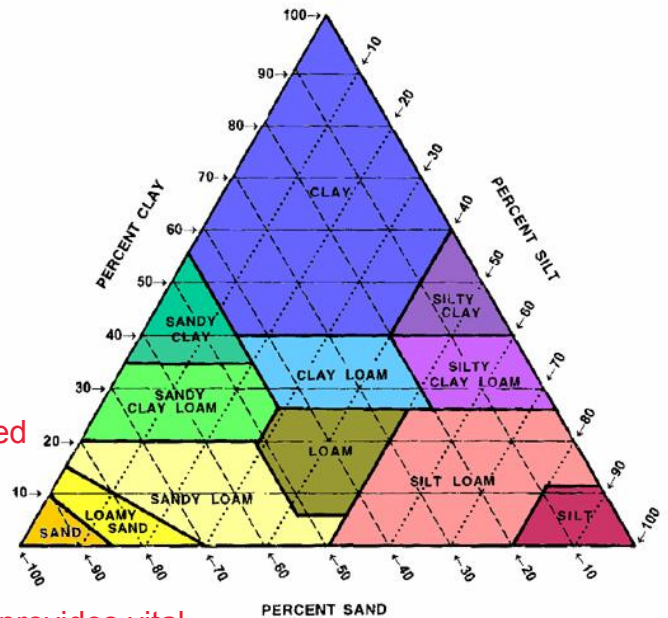
33. What is porosity? Amount of spaces between sediments.

34. Sands have more large pore spaces, so water and nutrients move through them quickly.

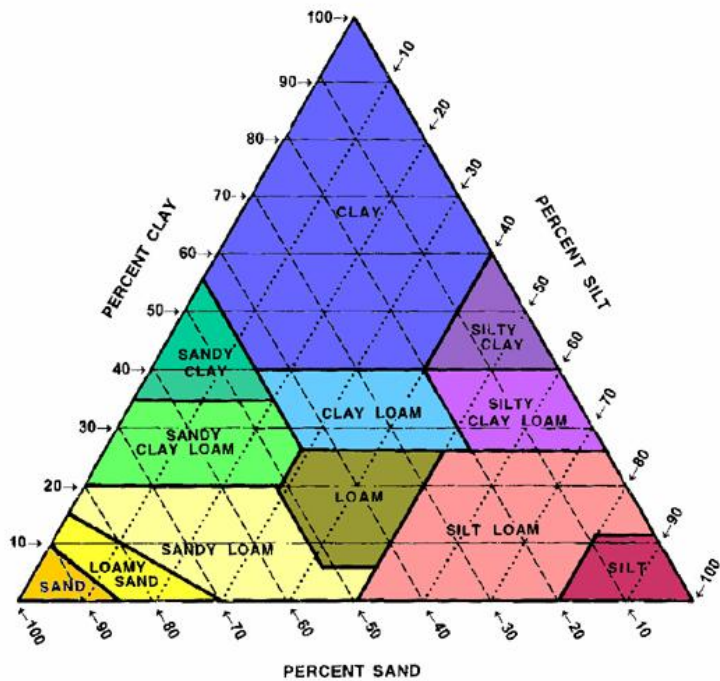
Clays have more small pore spaces, so water and nutrients move through them slowly.

35. Which soils are the best for most agriculture (growing food)? Why?

Loams, because they include a mixture of textures and a moderate level of permeability/nutrient flow



Soil Texture in the Real World



Soil name	Texture class	Depth (inches)	Shrink-swell potential
Sarpy	sandy loam	0-7 7-60	low low to moderate
Kennebec	silt loam	0-38 38-60	moderate low to moderate
Colo	silty clay loam	0-31 31-60	high high
Blend	silty clay	0-17 17-29 29-60	high moderate to high high
Nevin	clay loam	0-28 28-48 48-60	moderate to high moderate moderate
Kenmoor	loamy sand	0-24 24-60	low high

44. A local government voted against the large-scale development of buildings, bridges, and roads in an area. What could have been the motive behind their decision?

Loss of fertile soil, increase in erosion in the surrounding areas, lack of good soil for building structures

45. Which soil from the above chart would you choose to build roads, bridges, and roads on? Why?

Sandy loam or loamy sand because it has a lower shrink-swell potential.

46. What are the 3 soil nutrients that are essential for plant growth?

Nitrogen, phosphorus and potassium

47. List and describe 3 types of human activities that are impacting the lithosphere negatively **AND** what measures can be taken to improve these problems.

Human Activity	Environmental Problems Caused	Possible Solutions
Agriculture	Loss of soil nutrients, increased erosion, loss of biodiversity, pest resistance, loss of water	Small scale farms that limit use of chemicals/water and maintain soil nutrients.
Deforestation	Loss of biodiversity, soil erosion, water loss, loss of soil nutrients	Alternative forest management or replanting of trees harvested
Mining	Soil erosion, loss of soil nutrients, loss of biodiversity	Recycling of resources mined, more precise mining techniques

48. The Dust Bowl in the 1930s was a major example of wind erosion/loss of topsoil. It was caused by 2 major contributors:

- a. Industrialized agriculture
- b. Drought

49. The NRCS (Natural Resources Conservation Service) was founded after the Dust Bowl, and it helps farmers use methods that protect their soil. What are 3 methods farmers could use to take better care of their topsoil?

- a. Contour plowing
- b. Polyculture
- c. No-till farming

50. What is beach rejuvenation? What is your opinion of this practice? Why?

51. What are 2 devices that are used to stabilize the coastal shoreline from beach erosion?

52. What is fracking? Write a list of 3 pros and 3 cons of this practice.

53. Fill in the following table:

Energy Resources:	Extraction Methods:	Description of Energy Production:	Environmental Consequences:
Wood			
Peat			
Coal			
Oil			
Natural Gas			
Uranium			
Plutonium			