**Unit 4 Study Guide**

**Section 1: Weathering**

1. What are the 2 types of weathering and how are they different? Chemical (weathering that changes the chemicals a rock is made of) and Mechanical (breaks the rock down but the smaller pieces are made of the exact same chemicals)
2. What is frost wedging? What type of weathering is this? Frost wedging is when water gets in cracks, freezes, and expands to widen the crack. This is mechanical weathering.
3. Give examples of mechanical weathering. Roots: make and widen cracks. Exfoliation: the top rock layer is removed, releasing the pressure on the layers underneath, causing them to crack.
4. What are the 4 natural compounds that can do chemical weathering? Acid rain, oxygen, carbon dioxide, and water.
5. How does temperature affect weathering? Reactions happen faster when it is hotter, so chemical weathering is faster in warm weather.
6. What is the result of weathering by oxygen? Rust.
7. What is the result of weathering by carbon dioxide? Caves (esp. in limestone)
8. What substances cause acid rain? SO and NO compounds (sulfur oxides and nitrogen oxides)
9. How does latitude (location N or S on the planet) affect weathering? Areas near the equator are warmer and so experience more weathering than the north/south pole)
10. How does surface area affect weathering? The more surface area that’s exposed to elements of nature, the faster weathering will occur. This means a pile of small rocks will be weathered much faster than a large rock.
11. How does topography (slope) affect weathering? Weathering is faster on steep slopes, as gravity helps it along.

**Section 2: Groundwater**

1. Most drinkable fresh water comes from…. groundwater
2. How is it possible for water to be stored underground. The spaces between dirt/rock (pores) are either filled with air or water.
3. What is soil porosity? The spaces between the dirt/rock particles
4. What is the water table? The top of the water layer underground.
5. How does a well work? You dig until you go under the water table, and the water flowing underground continuously flows through the bottom of your well.
6. What is an aquifer? Water trapped underground that is between rock layers (like a natural pipe).
7. How does an artesian well work? You dig down under the aquifers and the water pressure forces the water to come up to the top of your well like a water fountain.
8. Explain what the water table has to do with springs. If the land dips down below the water table, water will fill that dip. That’s called a spring.
9. How does a geyser work? Underground water is heated into steam, this steam is forced to the surface through a narrow underground tunnel and shoots up into the air.
10. What would an area with karst topography look like? Filled with caves, sinkholes, streams
11. What type of rock are caves commonly made in? limestone

**Section 3: Soil**

1. How does a rock become soil? (Give the stages) It is weathered into smaller rock, which is weathered into sediment, this is mixed in with humus (biological organisms break down once-living material).
2. What are the 4 soil horizons and what is in each layer? O – top layer of leaf and litter, A – next layer of soil, lots of humus (broken down leaves and organic material); B – clay and small rocks, C - rocks
3. What are the 5 factors that influence soil formation? Climate, topography, biological organisms, parent material, and time
4. Which of these 5 factors is the most significant? climate
5. What is transported soil? Soil that is formed from a rock that came from somewhere else
6. What is the difference between sand, silt, and clay according to the texture triangle? Sand is the largest particle size, clay is the smallest particle size
7. How do you use the soil texture triangle? Look for the percentage of 2 soil types (sand, silt, or clay) – where they cross, that’s the soil texture you are dealing with.
8. Why are different soils different colors? They contain different chemicals based on the rocks they came from and the local weather (rain, chemicals in air, etc)

**Section 4: Erosion**

1. How is erosion different from weathering? Erosion moves the little bits of rock/sediment that has already been weathered
2. What is deposition? When the rocks/sediment is dropped somewhere
3. What is the difference between erosion by wind and erosion by water? Water erosion is faster and makes greater changes, is not as blocked by local vegetation/plants.
4. Water cannot do erosion without the force of \_\_\_\_\_\_. Gravity
5. Canyons and gorges are examples of erosion by… water (surface water)
6. Describe how stream erosion works: A stream carries materials (called a stream load) by suspension. Heavy objects are slowly pushed along the bottom (Called the bed load). If a stream is going fast, it can carry more/heavier particles (stream speed = discharge).
7. What is a meander? When a stream curves
8. How does water flow in a meander? Water moves fastest along the outside of a curve and slowest on the inside.
9. Where is sediment deposited in a meander? Along the inside of the curve where the water is moving slowly.