Elements, Rocks, Minerals, Soils – Unit 3 Review Sheet

- Know the role of elements in rocks, minerals, soils
- Know how each of the rocks form, and the identifying characteristics of each rock type
- Know how to interpret the rock cycle, including sedimentation, lithification, compaction, etc.
- Explain the difference between a rock and mineral
- Know the different type of tests you can do to determine the identity of a mineral
- Know mineral properties and what they are (cleavage, fracture, hardness, streak, etc)
- Be ready to answer questions about the soil pyramid
- Know the types of soil such as humus, sand, silt, clay...horizons, soil profile
- Be able to recognize different types of mass movement
- Explain the difference between weathering and erosion
- Know the types of weathering such as chemical/physical
- What are the conditions that will make rocks weather to soil the fastest?
- Know the sustainable farming practices

1. Fill out the chart on the type of rocks.

<table>
<thead>
<tr>
<th>Type of Rock</th>
<th>How is it formed?</th>
<th>What are the characteristics?</th>
<th>How are the rocks classified? (ex. foliated, clastic, extrusive)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Igneous Rock</td>
<td>Cooling magma &amp; crystallizes</td>
<td>hard, made of crystals</td>
<td>Intrusive - (Magma) Inside the Earth. Extrusive - (Lava) Earth’s surface</td>
</tr>
<tr>
<td>Metamorphic Rock</td>
<td>Heat &amp; Pressure &amp; Burned</td>
<td>commonly have layers.</td>
<td>Foilated - banded layers Non-foilated - no layers</td>
</tr>
<tr>
<td>Sedimentary Rock</td>
<td>Weathered rocks that are compacted &amp; cemented</td>
<td>may contain layers. may contain fossils.</td>
<td>Clastic sedimentary - Large weathered rock pieces.</td>
</tr>
</tbody>
</table>

2. Fill out the chart on how to classify minerals.

<table>
<thead>
<tr>
<th>Color</th>
<th>Small amount of elements give it color.</th>
<th>Ex. Black</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fracture</td>
<td>The tendency to break unevenly.</td>
<td>Ex. uneven break</td>
</tr>
<tr>
<td>---------------</td>
<td>---------------------------------</td>
<td>-----------------</td>
</tr>
<tr>
<td>Streak Color</td>
<td>color of the mineral in powdered form</td>
<td>Ex. Yellow</td>
</tr>
<tr>
<td>Luster</td>
<td>The ability to reflect light.</td>
<td>Ex. metallic/Non-metallic</td>
</tr>
<tr>
<td>Hardness</td>
<td>resistance to scratching</td>
<td>Ex. Mohs Scale is 6 because it can be scratched by glass.</td>
</tr>
<tr>
<td>Cleavage</td>
<td>even or flat breaks</td>
<td>Ex. flat break</td>
</tr>
<tr>
<td>Density</td>
<td>how heavy it is.</td>
<td>Ex. A quartz is heavier than talc.</td>
</tr>
</tbody>
</table>

3. What are some unusual characteristics of minerals? (Hint: Halite & Magnetite)  
   **Magnetic**  
   **taste**

4. Fill out the blanks found on the rock cycle.

![Rock Cycle Diagram]

**Word Bank**
- Weathering/Erosion
- Compaction/Cementation
- Heat & Pressure
- Melting
- Cooling
- Igneous Rock
- Metamorphic Rock
- Sedimentary Rock
5. What is the difference between a rock and a mineral?
   a. Rock: **solid**, **organic/inorganic**, made of minerals
   b. Mineral: **solid**, **inorganic**, made of crystals, **definite chemical composition**.

6. Determine if the descriptions are examples of mechanical or chemical weathering.
   a. Limestone dissolved by carbonic acid **chemical**
   b. The oxidation of minerals that contain iron **chemical**
   c. A large rock falling from a cliff and then breaking **mechanical**
   d. Tree roots cracking the concrete foundation of a house **mechanical**
   e. Formation of potholes in streets during severe winters **mechanical** *(frost wedging)*

7. Match the terms to their definitions.
   - A. chemical
   - B. weathering
   - C. root wedging
   - D. carbonic acid
   - E. leaching
   - F. physical
   - G. frost wedging
   - H. Deposition
   - I. Erosion

   a. Physical weathering caused by the action of freezing water
   b. Physical weathering caused by roots.
   c. When carbon dioxide and water combine chemically
   d. Type of weathering without change in chemical composition
   e. Type of weathering with a change in chemical composition
   f. Process in which minerals are dissolved in water and carried downward
   g. The breaking down of rocks
   h. The removal and transport of worn rocks and sediment.
   i. The deposit or stopping point for worn rocks and sediment.

8. Explain each type of mass movement. What is responsible for mass movement?
   - Slump: **slow moving land**
     - breaks off in large slabs
   - Creep: **slow moving land**
     - moving sideways like a stair case
   - Rockslide/landslide:
     - **fast moving**
     - caused by heavy rain + gravity
   - Mudflow:
     - **fast moving**
     - started by heavy rain.

9. Circle the correct answer in each statement about the rate of erosion.
   a. Rocks weather fastest in **hot** / cold) as well as (wet / dry) climates.
   b. Rocks weather slowest on a (flat area / **steep** area).
   c. Rocks weather fastest when a (larger / smaller) surface area is exposed.

10. Fill out the chart on soil texture.

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Particle Size</th>
<th>Texture</th>
<th>Water filtration or leaching ability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clay</td>
<td>small</td>
<td>sticky</td>
<td>Low leaching, little water doesn't move through easily</td>
</tr>
</tbody>
</table>
11. Use the soil triangle to answer the questions.

a. What is the range of percentages of clay in the clay loam?
   25% - 40%

b. What is the soil type for 15% sand, 45% silt, and 40% sand?
   Silty clay

12. Be able to identity and describe each soil horizon.

Word Bank & Descriptions:

A Horizon: Topsoil
- sand, silt, + clay

B Horizon: Subsoil
- rock pieces + clay

O Horizon: Organic layer
- humus

C Horizon: Parent Rock
- rocks + soil

R Horizon: Bedrock (hard rock)
13. Fill out the chart on agriculture.

<table>
<thead>
<tr>
<th>Type of Agriculture</th>
<th>What is it?</th>
<th>Pros</th>
<th>Cons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organic Farming</td>
<td>Not using chemicals such as fertilizer &amp; pesticides on plants</td>
<td>Better for environment</td>
<td>Cost</td>
</tr>
<tr>
<td>Crop Rotation</td>
<td>Alternating crops, plants each year to avoid depleting soil.</td>
<td>Keep soil healthy</td>
<td>Planning</td>
</tr>
<tr>
<td>Terracing /Contour</td>
<td>Creating slopes to plant on</td>
<td>Prevents erosion</td>
<td>More time required</td>
</tr>
</tbody>
</table>

14. What is sustainable farming?

Production of plants & animals w/ farming techniques that protect the environment.

15. Give examples of sustainable farming practices.
   a. Organic farming
   b. Reducing tillage (digging up of ground)
   c. Rotating crops