Study Guide Answers for Rocks, Weathering, Erosion, and Rock Cycle Skills Assessment

A proficient student can describe how the different types of rocks are formed. They can explain the rock cycle, and they can contrast mechanical weathering, chemical weathering, and erosion.

1. **How are rocks and minerals related?**
   1. **Rocks are made of minerals**
2. **Name the 3 main types of rocks and explain how they are formed?**
   1. **Igneous rocks-formed from the cooling of magma or lava**
   2. **Sedimentary rocks-formed when particles of other rocks or the remains of plants and animals are pressed and cemented together**
   3. **Metamorphic rocks-formed when heat, pressure or chemical reactions change rocks from one type to another**
3. **What is the difference between and intrusive igneous rock and an extrusive igneous rock?**
   1. **Intrusive igneous rocks form when magma cools below Earth’s surface**
   2. **Extrusive igneous rocks form when lava cools on Earth’s surface**
4. **Name and describe the steps that are necessary for a sedimentary rock to form.**
   1. **Erosion-the sediment is removed by wind, water, ice or gravity**
   2. **Deposition-the sediment particles settle out of the air or water and pile on top of each other**
   3. **Compaction-the weight of the sediment particles piling on top of each other squeezes them together**
   4. **Cementation-the mineral particles dissolve in water and the dissolved minerals mixed with the rock particles act as glue to bind the particles together**
5. **What is the difference between weathering and erosion?**
   1. **Weathering is the process that breaks down rocks and other substances at Earth’s surface**
   2. **Erosion is the removal of rock particles by wind, water, ice and gravity**
6. **What is the difference between mechanical weathering and chemical weathering?**
   1. **Mechanical weathering is the type of weathering where rocks are physically broken into smaller pieces**
   2. **Chemical weathering is the process that breaks down rock through chemical changes**
7. **Name and describe the 5 forces that cause mechanical weathering.**
   1. **Freezing and thawing-water seeps into cracks in rocks, freezes, expands, and acts like a wedge to push the rock apart**
   2. **Release of Pressure-as erosion removes material from the rock’s surface, the pressure on the rock goes down, and that release of pressure makes the outside of the rock crack and flake off**
   3. **Animal Actions-burrowing animals loosen and break rocks apart in the soil**
   4. **Plant Growth-roots of trees and plants enter the cracks in rocks, then as they grow, they force the cracks farther apart**
   5. **Abrasion-Sand and other rock particles that are carried by wind, water or ice can wear away exposed rock surfaces like sandpaper rubbing against wood**
8. **Name and describe the 5 forces that cause chemical weathering.**
   1. **Water Action-the most important cause of chemical weathering-dissolves rock**
   2. **Oxygen-the oxygen in air combines with iron in rocks to form rust (oxidation) which makes rocks soft and crumbly**
   3. **Carbon Dioxide-carbon dioxide gas air dissolves in rainwater to form carbonic acid, which weathers rocks**
   4. **Living Organisms-Plant roots that grow into cracks in rocks produce weak acids that weather rocks**
   5. **Acid Rain-Sulfur, Carbon, and Nitrogen compounds in the air react with water vapor in clouds to form acids. The acids mix with raindrops and fall as acid rain, which weathers rocks very quickly**
9. **What factors affect the rate a rock weathers?**
   1. **The type of rock (the type of mineral in the rock and whether the minerals dissolve easily or not)**
   2. **The climat (the average weather conditions) –hot and wet climates weather rocks fast, cold climates and dry climates weather rocks more slowly**
10. **What is the rock cycle?**
    1. **A series of processes on Earth’s surface and in the crust and mantle that slowly change rocks from one kind to another**
11. **What causes the uplift, folding and faulting that move rocks through the rock cycle?**
    1. **Movements of Earth’s tectonic plates**
12. **Use the rock cycle to describe how the following rocks could change:**
    1. **From an igneous rock to a sedimentary rock-the igneous rock is weathered, eroded, deposited, compacted and cemented**
    2. **From an igneous rock to a metamorphic rock-it undergoes extreme heat and pressure**
    3. **From a sedimentary rock to an igneous rock-it is melted in the mantle and then the magma or lava cools**
    4. **From a sedimentary rock to a metamorphic rock-it undergoes extreme heat and pressure**
    5. **From a metamorphic rock to an igneous rock-it is melted in the mantle and then magma or lava cools**
    6. **From a metamorphic rock to a sedimentary rock-it is weathered, eroded, deposited, compacted and cemented.**