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**8th grade 1st semester final study guide**

Minerals
**Vocabulary to Know**Color

Moh’s scale

Luster (know the two types)

Hardness

Streak

Crystal

Fracture

Cleavage

Gem

**Concepts to understand**

1. Know how/when a mineral will scratch another mineral
2. Know the hardest mineral on the Moh’s scale
3. Know the softest mineral on the Moh’s scale
4. Know what a streak test is and why a streak test is used
5. Know the four characteristics of a mineral

Rocks
**Vocabulary to know (also good to know some examples of each):**

Rock Cycle

Sedimentary rock

Sediment

Metamorphic rock

Extrusive igneous rock

Intrusive igneous rock

Igneous rock

Foliated

Nonfoliated

Regional Metamorphism

Contact Metamorphism

Lithification

Partial Melting

Fractional Recrystallization

Felsic

Mafic

Deposition

**Concepts to Understand**

1. Know how the rock cycle works (be able to label it if needed)
2. Compare and contrast magma and lava. What two types of igneous rocks are formed as each cools?
3. What are the factors that affect magma formation?
4. Describe the three major groups of igneous rocks.
5. Can an igneous rock become a metamorphic rock through the rock cycle? Can it become a sedimentary rock? (What about the other types of rocks…can they become any of the other rocks through the rock cycle?)

1. What chemical property is most commonly used to classify igneous rocks?
2. Why do sediment deposits tend to form layers?
3. How are clastic sediments formed, and how do scientists classify them?
4. Describe the main types of clastic sedimentary rocks.
5. Why do chemical sedimentary rocks form primarily in areas that have high rates of evaporation?
6. How can the chemical composition of a rock be changed during metamorphism?
7. What are the three main types of metamorphism? Compare and contrast the factors that cause each type.
8. What causes foliated metamorphic textures?
9. How are the three types of rocks classified?

**Landforms**

Valleys

* A valley is a hollow or surface depression of the earth bounded by hills or mountains, a natural trough in the earth's surface that slopes down to a stream, lake or the ocean, formed by water and/or ice erosion.
* At the bottom of many valleys is fertile soil, which makes excellent farmland.
* Most valleys on dry land are formed by running water of streams and rivers.
* The bottom of a valley is called its floor. Most floors slope downstream.
* Mountain valleys usually have narrow floors.
* The part of the floor along riverbanks is called flood plain.
* A valley's sides are called valley walls or valley slopes.
* The form of a valley depends upon the rate at which deepening and widening goes on.
* V-shaped valleys are caused by forces such as erosion and rivers. Valleys are not at all formed by rivers.
* Valleys that are not V-shaped were formerly occupied by glaciers and are characteristically U-shaped, formed by the huge bodies of ice that moved along; they carved the valleys as they passed, carrying away giant boulders and huge amounts of debris.
* Narrow deep valleys are sometimes called canyons.
* A valley has two characteristics, one is low land, another is being formed between hills or mountains.
* Valleys in low areas have an average slope; in the mountains, valleys are deep and narrow.
* Erosion by rivers is a main valley-forming process; other processes, such as movement of the earth's crust and glaciers, also have an important part in some cases.

Plateaus

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| * A plateau is a large highland area of fairly level land separated from surrounding land by steep slopes.
* They cover about 45 percent of the Earth's land surface.
* Some plateaus, such as the Deccan of India and the Columbia Plateau of the United States, are basaltic and were formed as the result of many lava flows covering hundreds of thousands of square kilometers that built up the land surface.
* Others are the result of upward folding; still others have been left elevated by the erosion of nearby lands.
* Plateaus, like all elevated regions, are subject to erosion, which removes great amounts of the upland surface.
* Many of the world's high plateaus are deserts.
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Mountains

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| * Over long periods of time, mountains are created by tremendous forces in the earth with a steep top usually shaped up to a peak or ridge.
* Mountains occur more often in oceans than on land; some islands are the peaks of mountains coming out of the water.
* Mountains are formed by volcanism, erosion, and disturbances or uplift in the earth's crust.
* Most geologists believe that the majority of mountains are formed by geological forces heat and pressure producing changes under the earth's crust and movements in the earth's crust.
* They call this movement plate tectonics. This theory sees the crust of the earth divided into a number of vast rigid plates that move about at the rate of a few centimeters a year. The uplift is caused by the collision of plates below the earth's surface that triggers various geologic processes that produce this crustal uplift. Other processes are caused by horizontal compression that is the deformation of crustal strata which produces folds or wrinkles.
* Some ranges of low mountains are raised by nontectonic processes, and are caused by sculpturing effects of differential erosion.
* Erosion occurs when wind, rain and ice are present. Mountains are impacted by erosion through the combined action of wind, rain and ice changing the shapes of the mountains.
* Volcanism causes mountains to form. Examples of mountains formed by periodically dangerous volcanic action are Mount Rainer and Mount Saint Helens in the United States, Mount Erebus in Antarctica, Mount Vesuvius in Italy, and Mount Fuji in Japan. Many of these volcanic mountains have summit craters that still emit steam and debris; others that no longer show signs of volcanic activity may only be dormant, not extinct. Shield volcanoes found in Mauna Loa and Mauna Kea in Hawaii are less spectacular even when quite high.
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Plains

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| * Plains are broad, nearly level stretches of land that have no great changes in elevation.
* Plains are generally lower than the land around them; they may be found along a coast or inland.
* Coastal plains generally rise from sea level until they meet higher landforms such as mountains or plateaus. Inland plains may be found at high altitudes.
* Plant life on plains is controlled by the climate. Thick forests usually thrive on plains in humid climates; grasslands cover fairly dry plains such as the Great Plains in the United States.
* Plains are usually well populated because the soil and terrain are good for farming, and roads and railways are easily built between rural towns and cities.
* A coastal plain is a stretch of lowland along a seacoast which slopes toward the sea. In most cases, such a plain may be an elevated part of the ocean floor. Solid materials are carried off by rivers or waves from other coastal plains; these materials are deposited along the shore extending the coast seaward.
* A flood plain is the floor of a river valley beyond the riverbed. A flood plain is formed of mud, sand, and silt that are left behind when the river overflows its banks. These materials are carried off by the river as it erodes the land upstream. A river in flood conditions can carry a large amount of eroded material, which the overflow waters deposit onto the flood plain.
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Hills

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| * Hills are elevations of the earth's surface that have distinct summits, but are lower in elevation than mountains.
* Hills may be formed by a buildup of rock debris or sand deposited by glaciers and wind.
* Hills may be created by faults. Faults are a slight crack in the earth which can cause earthquakes. Hills are formed when these faults go slightly upward. hills in low mountain valleys, valleys, plains, and even in your own backyard.
* Hills are also formed by deep erosion of areas that were raised by disturbances in the earth's crust.
* Erosion forms hills by carrying away all of the soil on a mountain, causing a hill to be left behind.
* Humans also make hills by digging soil up and dumping it in a giant pile.
* Volcanoes are also another way that hills are formed. Volcanoes form hills when they erupt. During the eruption, volcanic ash is spewed through the air; after the eruption, the lava or molten rock hardens and builds up a thick layer of lava rock. The ash falls on the hardened lava causing a layer of ash to form on the hill. When rain falls, this layer of ash mixes with the rainwater to form black colored water. This black water will freeze causing the lava rock to crack and crumble and eventually erode to form a hill.

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| Loess* Loess is a geologically recent deposit of silt or material which is usually yellowish or brown in color and consisting of tiny mineral particles brought by wind to the places where they now lie.
* It is a product of past glacial activity in an area.
* It is a sedimentary deposit of mineral particles which are finer than sand but coarser than dust or clay, deposited by the wind.
* Loess is a type of silt which forms fertile topsoil in some parts of the world. Loess deposits are usually a few meters thick.
* One of the key characteristics of these deposits is the ‘cat steps'. The soil has few clay particles to hold it together. It is composed mainly of quartz crystals which slide easily against each other, and is therefore very subject to erosion. Because of this, there are mini-earth slides, which form the steps.
* Loess was formed during the time after the Ice Age when glaciers covered a great portion of the earth. When the climate warmed up, the warm temperatures melted the glaciers creating tremendous flows of water down into a valley or river, and exposing vast plains of mud. When these plains dried, strong winds blew the exposed sediments and swept the finer materials from the flood plains into huge clouds of dust, which were deposited into the bluffs, that is, bold steep banks.
* As silt accumulated, higher bluffs were formed. Often several loess deposits are stacked on top of each other, because each individual glacier produced new loess deposits.

Glaciers

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| * Ice sheets and glaciers form the largest component of perennial ice on this planet.
* Over 75% of the world's fresh water is presently locked up in these frozen reservoirs.
* A glacier is a huge mass of ice that flows slowly over land. They form in the cold polar regions and in high mountains.
* The low temperatures in these places enable large amounts of snow to build up and turn into ice. Most glaciers range in thickness from about 91 to 3,000 meters.
* Glaciers are formed when more snow falls during the winter than melts and evaporates in summer. The extra snow gradually builds up in layers. Its increasing weight causes the snow crystals under the surface to become compact, grain like pellets. At depths of 15 meters or more, the pellets are further compressed into thick crystals of ice. These crystals combine to form glacial ice. The ice eventually becomes so thick that it begins to move under the pressure of its own great weight.
* Huge moving sheets of ice are wearing down parts of the earth's surface.
* The ice sheet that covers much of Greenland is growing smaller because of a gradual rise in temperature in the area since the early 1900s.
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**Earth Science 7.1 Weathering**

**Vocabulary
Define the following vocabulary words.**

Weathering:

Erosion:

Mechanical Weathering:

Chemical Weathering:

Frost Wedging:

Exfoliation:

Hydrolysis:

Oxidation:

**Reading Questions (pages 153-161)**

1. In figure 7-2 (page 154 of your book), how do you know that the formations occurs as a result of mechanical weathering?
2. Distinguish between weathering and erosion.
3. What are some variables that affect the rate of weathering?
4. What two climatic factors are the most important in the weathering process?
5. In Figure 7-9 (page 160 in your book), why do you think the rocks formed in this way?
6. What are the two factors that play a role in mechanical weathering? Explain.
7. Explain how water and oxygen can cause chemical weathering.

**Earth Science 7.2 Erosion and Deposition
Vocabulary
Define the following vocabulary words.**

Deposition:

Rill Erosion:

Gully Erosion:

**Reading Questions (pages 162-166)**

1. In the erosional process, what is gravity’s role in relationship to the other agents of erosion?
2. What is the difference between rill erosion and gully erosion? Which is the most damaging?
3. In what ways do the activities of humans affect the processes of erosion and weathering?
4. Where (what type of climate) does wind play a major role in erosion?
5. What are wind barriers and what are they used for?

**7.3 Formation of Soil**

**Development of Soil**

* **Soil-** the loose covering of broken rock particles and decaying organic matter, called **humus,** overlying the bedrock of Earth’s surface
* Soil is the result of chemical and mechanical weathering over long periods of time
* The soil forming process begins when weathering breaks solid bedrock into smaller pieces
* Forest soils contain a much higher percentage of organic matter than desert soils do

**Soil Composition**

* Soil forms in layers
* Solid bedrock from which weathered pieces of rock first break off is known as the **parent rock**
* Soil located above its parent material is called **residual soil**
* **Transported soil-** has been moved to a location away from its parent bedrock
* Agents of erosion: running water, wind, glaciers, gravity (these move soil)
* Precipitation can run through the top layers of soil and bring dissolved soluble minerals and carry them to lower layers
* The length of time it takes for soil to form depends on the type of parent rock as well as the climatic conditions
* It can take hundreds of years for only a cm of soil to form

**Soil Profiles**

* **Soil profile-** is the vertical sequence of soil layers
* **Soil Horizons-** a distinct layer or zone in a soil profile
* There are three types of soil horizons: A, B and C
* Horizon A- high levels of organic matter and humus, they range from grey to black in color
* Horizon B- contains subsoils that are enriched with clay minerals, they may be red or brown because of iron oxide
* Horizon C- directly above solid bedrock, contains weathered parent material
* All horizons are distinct and well developed in mature soils