

Chapter 16.2 Environmental Science – MINERAL EXPLORATION AND MINING Chart

Directions: Fill in the information from the classroom or online chart.

Environmental Science Standard and element:

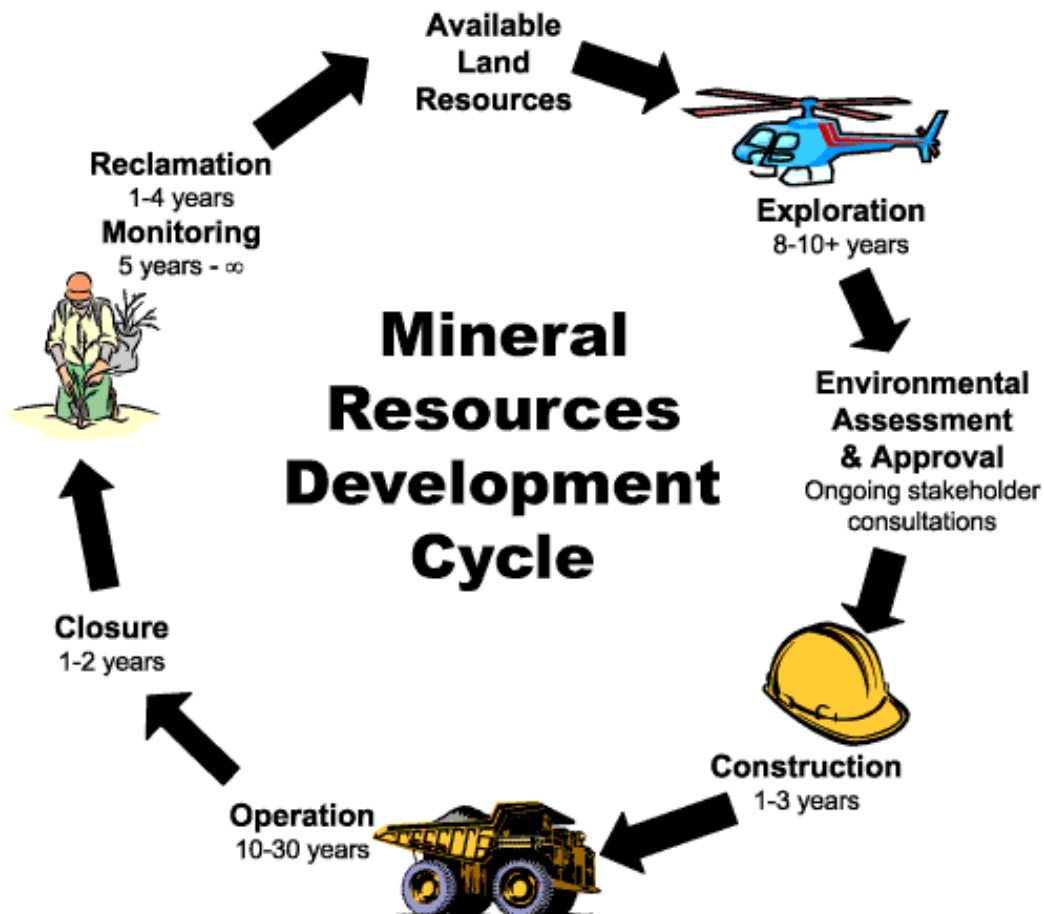
SEV4. Students will understand and describe availability, allocation and conservation of energy and other resources.

- a.) **Differentiate between renewable and nonrenewable resources including how different resources are produced, rates of use, renewal rates, and limitations of sources. Distinguish between natural and produced resources.**

STUDENT CHECKLIST

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| 1.) Put the chart in your Science Notebook behind the Chapter 15 Word Study after it has been checked. | _____yes | _____no |
| 2.) The CHART was accurate and complete with no abbreviated information. | _____yes | _____no |
| 3.) The Information was written neatly and large and dark enough to be easily seen. | _____yes | _____no |
| 4.) All information was complete with no grammar or spelling errors. | _____yes | _____no |

Mineral Exploration	<ul style="list-style-type: none"> • Mining companies hire mineralogists to locate areas where there is a high probability of finding the mineral resource they are looking for. • Planes are used to help find minerals with specialized instruments that identify changes in gravity, magnetism, and radioactivity. • Next they collect samples from areas that seem promising. • If the ore grade is high enough, and there appears to be enough ore, then a mine is opened. • After all the ore is cut or dug out, then the mining company is supposed to restore the land.
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Subsurface Mining – Ore deposits that are usually found 50 meters (*about 164 feet*) or more beneath Earth’s surface are mined using subsurface mining methods. A common method is called **room-and-pillar mining**. In coal mines, rooms are cut into seams. Between the rooms, pillars of coal are left standing to support the roof. When the mining of the rooms is finished, the pillars of coal are then removed.

Longwall Mining	<ul style="list-style-type: none"> • A type of subsurface mining • A machine called a shearer moves back and forth across a wall of coal • the wall, called a longwall, may be more than 300 meters (<i>over 984 feet</i>). As coal is cut off the wall by the shearer, it falls on a conveyer which carries the coal out of the mine • As the shearer moves forward, the mine roof behinds collapses
Solution Mining	<ul style="list-style-type: none"> • A type of subsurface mining • Hot water is injected into the soft ore being mined and dissolves it • Compressed air is then pumped into the dissolved ore, and air bubbles lift it to the surface of the mine

Surface Mining – Subsurface methods are used when ore deposits are located near the surface. Open-pit mining is when the ore is mined downward, layer by layer. Explosives may be used to break up the rock which is then loaded onto haul trucks. Haul trucks take the rock to leaching pads where the ore is extracted using chemicals.

Surface Coal Mining	<ul style="list-style-type: none"> • A type of surface mining • In the 19th-century, horse or mule-drawn plows were used to remove the rock, called overburden. • Today, large machines strip the overburden that covers shallow coal deposits. • Once the coal is taken out, the soil that was set aside is put back in the pit.
Quarrying	<ul style="list-style-type: none"> • A type of surface mining • Large open surfaces where building stones such as marble and granite are cut or dug out of the ground producing large holes is called quarrying. • Sand, gravel, and crushed rock, which are known as aggregates, are the main products of quarrying.
Solar Evaporation	<ul style="list-style-type: none"> • seawater, which is about 2.7 percent sodium chloride, is put into large, shallow ponds • the sun evaporates the sea water • the salt is extracted • about 30 percent of the world's salt comes from this process

Fracking or Hydraulic Fracturing	<ul style="list-style-type: none"> • process of fracturing a rock by pressurized liquid to extract minerals • can contaminate groundwater because of the chemicals used and large amounts of water needed • pushes gases and hydraulic fracturing chemicals to the surface • increases seismic activity and increase in sink holes • possible health issues for those who live near fracking mines • used mainly to extract natural gas and coal
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Placer Mining - When rock weathers and disintegrates, minerals within the rock are released. These minerals are concentrated by wind and water into surface deposits called placer deposits. When streams transport mineral grains to a point where they fall to the streambed and become concentrated in one area. Placer gold, diamonds, and other heavy minerals mined by **dredging**. Dredging is the process of taking large amount of sand, silt, and minerals out of the bottom of an area of water to extract minerals or make the water deeper for ships.

Smelting - The process in which crushed ore is melted at high temperatures in furnaces to separate impurities from molten minerals.

Undersea Mining	<ul style="list-style-type: none"> • the process of extracting minerals from the ocean • land-based companies can usually extract minerals cheaper • many mineral deposits are deep in the ocean making them difficult to get to
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