**Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Period\_\_\_\_\_\_\_Date\_\_\_\_\_\_\_\_\_\_\_\_**

Chapter 4 Guided Notes: Earth’s Resources

Section 4.1: Energy and Mineral Resources

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ resources can be replenished over fairly short spans of times, such as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_resources take \_\_\_\_\_\_\_\_\_\_\_of years to form and accumulate
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that may be used as fuel including \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Coal

* Formed when \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ transform \_\_\_\_\_\_\_material over millions of years
* Four stages of development: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Used to generate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and production of \_\_\_\_\_\_\_\_\_\_\_\_\_
* Mined three different ways\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Advantages of Coal:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, in US can provide about \_\_\_\_\_\_\_ years
  + \_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Disadvantages of Coal:
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - \_\_\_\_\_\_from the \_\_\_\_\_\_\_ when burning coal
    - Releases \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, about \_\_\_\_\_% efficient from coal to electricity

Natural Gas and Petroleum

* Formed from remains of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that were buried in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_--
* Formation begins when large quantities of \_\_\_\_\_\_\_\_\_\_ become buried in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_; over \_\_\_\_\_\_\_\_\_\_\_\_\_ of years, chemical reactions slowly transform some of the organic remains into the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ form
* \_\_\_\_\_\_\_\_\_\_\_: geologic structure that allows large amounts of \_\_\_\_\_\_\_\_\_to accumulated
  + All have two things in common
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: allows oil and gas to collect in \_\_\_\_\_\_\_quantities
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: near impenetrable so keeps oil and gas from escaping to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - \_\_\_\_\_\_\_\_\_\_\_\_ in an uparched series of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Advantages of Petroleum
  + \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Disadvantages of Petroleum
  + \_\_\_\_\_\_\_\_emissions, recovery process not \_\_\_\_\_\_\_\_\_\_\_\_, drilling endangers\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_
* Advantages of Natural Gas
  + Burns cleaner that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_% less\_\_\_\_\_\_\_ than other fossil fuels
* Disadvantages of Natural Gas
  + Inability to recover all in-place gas from producible\_\_\_\_\_\_\_\_\_, lack of \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Tar Sands and Oil Shale

* \_\_\_\_\_\_\_derived from tar sand and oil shales could become good substitutes for dwindling petroleum supplies
* \_\_\_\_\_\_\_\_\_\_\_\_: mixtures of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ combined with \_\_\_\_\_\_ and varying amounts of back, thick tar called \_\_\_\_\_\_\_\_\_\_\_
  + Can be pumped out \_\_\_\_\_\_\_\_\_\_\_
  + Requires lots of \_\_\_\_\_\_\_\_\_\_\_\_
  + Can lead to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ponds
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_: rock that contains \_\_\_\_\_\_\_\_mixture of hydrocarbons called \_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_ of world’s supply in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Formation of Mineral Deposits

* Some of the most important mineral deposits form through \_\_\_\_\_\_\_\_\_\_\_\_ processes and from \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_solutions
  + \_\_\_\_\_\_\_ is a useful \_\_\_\_\_\_\_\_\_mineral that can be mined at a profit
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ just a few deposits produced by igneous processes
  + Hydrothermal solutions
    - \_\_\_\_\_\_\_\_\_\_\_
    - Hydrothermal deposits form from hot, \_\_\_\_\_\_\_\_\_\_\_\_\_\_fluids that are left during the \_\_\_\_\_ stages of movement and cooling of \_\_\_\_\_\_
    - Examples: \_\_\_\_\_\_\_\_deposit in \_\_\_\_\_\_Dakota; \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_ deposits in \_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_ deposits in Michigan
* \_\_\_\_\_\_\_\_\_Deposits
  + Formed when \_\_\_\_\_\_\_\_\_\_heavy minerals settle \_\_\_\_\_\_\_from moving \_\_\_\_\_\_\_ while less \_\_\_\_\_\_\_ particles remain suspended and continue to move
  + Usually involve minerals that are heavy but also \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Common Sites: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Best known example of placer deposit: \_\_\_\_\_\_\_\_\_\_\_\_

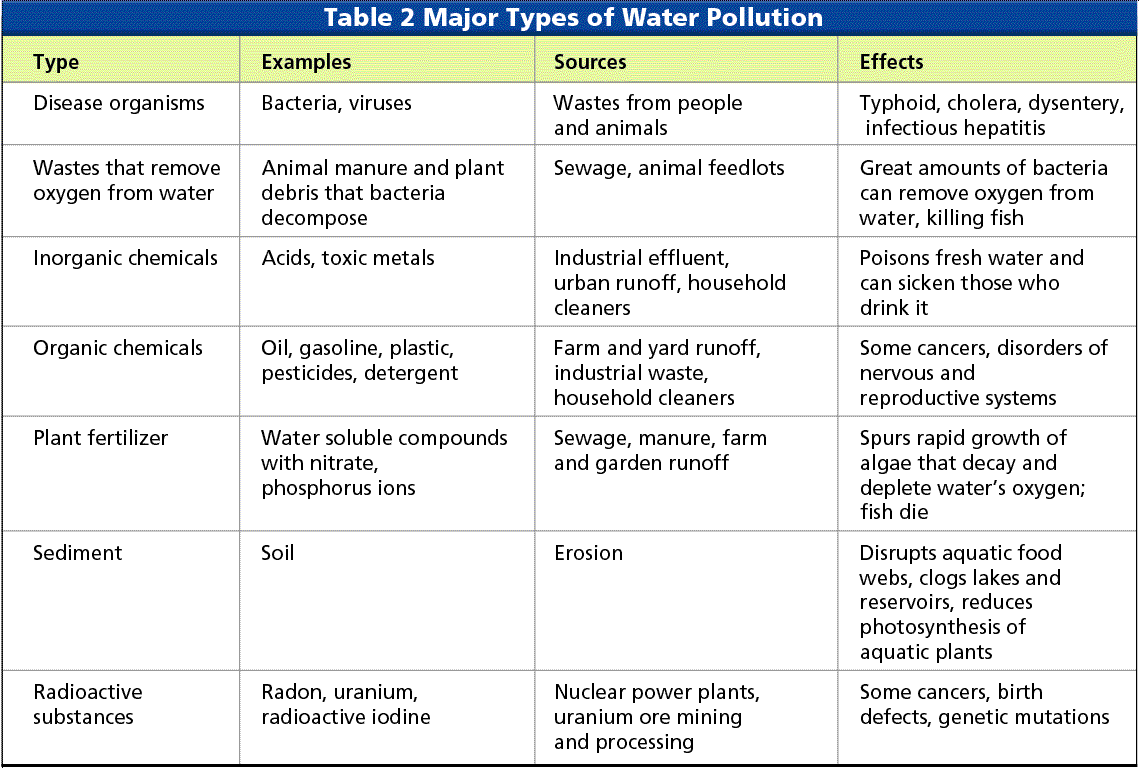
Section 4.2: Alternate Energy Sources

* Solar Energy
  + Two advantages:
    - Solar energy’s fuel ( )is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Solar energy is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Disadvantages:
    - Solar energy is not \_\_\_\_\_\_\_\_
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + How some work:
    - Active solar \_\_\_\_\_\_\_\_\_\_\_\_\_\_
      * Roof mounted devices, collect \_\_\_\_\_\_\_ from sun that can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to areas where it is needed by circulating \_\_\_\_\_\_\_\_\_\_\_\_\_\_ through piping
      * Also used to heat water
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_cells
      * Convert sunlight’s energy into \_\_\_\_\_\_\_\_\_\_\_\_\_
* Nuclear Energy
  + In nuclear \_\_\_\_\_\_\_\_\_\_, the \_\_\_\_\_\_\_\_\_\_\_\_ of heavy atoms like \_\_\_\_\_\_\_\_\_\_\_\_\_\_ are bombarded with \_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + The uranium nuclei \_\_\_\_\_\_\_ into smaller nuclei and emit \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Advantages:
    - \_\_\_\_\_ emissions, fuel can be \_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Disadvantages:
    - Potential of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, problem with where to put \_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_can cause damage and leaks at plants, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Wind Energy
  + In the next \_\_\_\_\_\_\_\_\_ years, wind power could meet between \_\_\_\_\_\_\_\_\_\_\_\_% of the country’s demand for electricity
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ alternate energy source
  + Advantages
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, not many emissions (still need \_\_\_\_\_\_\_\_\_ that is produced from \_\_\_\_\_\_\_\_\_\_)
  + Disadvantages
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, turbines may be \_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ availability
* Hydroelectric Power
  + Power generated by \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + The water held in a \_\_\_\_\_\_\_\_\_\_\_\_\_behind a dam is a form of stored energy that can be released through the dam to produce \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - The \_\_\_\_\_\_water flow that results, drives \_\_\_\_\_\_\_\_\_\_\_\_and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - Negative Effects: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - We’ve built all the dams we can! \_\_\_\_\_% of US rivers are dammed
* Geothermal Energy
  + Harnessed by tapping natural underground reservoirs of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Hot water is used directly for \_\_\_\_\_\_\_\_\_\_\_\_\_\_and to turn turbines that generate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_gets \_\_\_\_\_% of energy from geothermal
  + No harmful products, little maintenance after construction of plants
  + \_\_\_\_\_\_\_\_\_ be built everywhere
* Tidal power
  + Harnessed by constructing a dam across the \_\_\_\_\_\_\_\_\_\_\_\_of a bay or an estuary in \_\_\_\_\_\_\_\_\_\_\_\_areas
  + The strong in and out flow of tidal water drives \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Section 4.3: Water, Air, and Land Resources

The Water Planet

* Each day people use fresh water for drinking, cooking, bathing, and growing food
* Water covers \_\_\_\_\_\_\_\_% of Earth’s surface
* <\_\_\_\_\_\_% of water is usable \_\_\_\_\_\_\_\_\_\_water
* Freshwater Pollution
  + \_\_\_\_\_\_\_\_\_\_\_\_\_source pollution comes from a \_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_ location, such as factory pipes
  + \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_source pollution is pollution that does \_\_\_\_\_have a specific point of \_\_\_\_\_\_\_\_\_\_\_
  + \_\_\_\_\_\_\_\_\_\_ is the water that flows \_\_\_\_\_\_ the land rather than seeping into the \_\_\_\_\_\_\_\_, often carrying \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pollution
* Water pollution can lead to:



Earth’s blanket of Air

* The chemical composition of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_helps maintain life on Earth
* Pollution in the Air
  + The increase of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the atmosphere has altered the \_\_\_\_\_\_\_ cycle and contributed to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_-the unnatural warming of the \_\_\_\_\_\_\_\_\_\_\_ atmosphere
  + Through a series of chemical reactions, these pollutants in the air are converted to \_\_\_\_\_\_\_\_ that are a major cause of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Burning of fossil fuels also produces \_\_\_\_\_\_\_\_
* Global Warming could result in big changes in Earth’s environment
  + These changes could include:
* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(CFCs) once used in air conditioners and plastic foam production destroy \_\_\_\_\_\_\_\_ in the stratosphere layer of the atmosphere
  + Could result in increased health problems like cataracts and skin cancer because more of the suns UV radiation would reach Earth’s \_\_\_\_\_\_\_\_\_\_

Land Resources

* Earth’s land provides \_\_\_\_\_\_\_\_\_\_\_\_, as well as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ resources
* Damage to land resources
  + \_\_\_\_\_\_\_\_\_ produce many mineral resources, but mines are destroying \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + Mines also cause \_\_\_\_\_\_\_\_\_\_\_\_ and pollution that contaminates soil and water and destroys \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Section 4.4: Protecting Resources

* \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the careful use of resources
* Pollution prevention means stopping pollution from entering the environment
* Starting in the \_\_\_\_\_\_\_\_\_\_, the federal government passed several laws to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ pollution and protect resources
  + In \_\_\_\_\_\_, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(CWA) required industries to reduce or eliminate \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_pollution into surface waters
  + The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_of 1974 helped protect drinking resources
* In the 1970’s, Congress passed the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the nation’s most \_\_\_\_\_\_\_\_\_\_\_ air pollution act
  + Established six “criteria” for pollutants known to cause health problems:
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* Caring for Land Resources
  + Protecting land resources involves preventing pollution and managing land resources wisely
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_- is partly \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_material that can be used as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the collecting and processing of \_\_\_\_\_ items so that they can be made into \_\_\_\_\_\_ products
  + Recycling Facts:
    - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_tons of municipal waste per year
    - Average American produces \_\_\_\_\_\_\_lbs of trash per day
    - US Recycles about \_\_\_\_\_\_\_ of all waste
    - \_\_\_\_\_\_% of paper products recycled
    - \_\_\_\_\_\_\_% energy saved by recycling an aluminum can compared with manufacturing a new one