Page # \_\_\_\_\_ Energy Recap Notes

**All things need energy**

* All organisms on Earth, including humans, use energy derived from resources provided by the environment
* The Earth supplies a variety of natural resources that living things use, change, and reuse. Some of these resources can be replaced and/or reused in nature (**renewable resources)**, while others cannot be replaced in nature (**nonrenewable**).

**Renewable Resource:**

* **renewable resources** are replaced at a rate that is equal to or greater than the rate at which they are being used.
* Examples of renewable resources are:

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| **Biomass** – is organic matter such as plant and animal waste that is burned and converted into energy. Biomass can sometimes release just as many carbon dioxide into the atmosphere as fossil fuels. Biomass takes up a lot of land for crops, which can be used to raise food. | **Geothermal** – comes from underground water that is heated by hot rock. The water is heated into steam which turns the turbines and powers generators. Excess water is pumped back into the ground to be reused. Geothermal is clean and renewable but has a limited availability of where it can currently be used | **Hydroelectric** – produced by moving water, in most cases a dam, which is built across body of water and blocking the flow of water. This can lead to potential problems with flooding and deforestation. |
| **Wind** – turbines are made of metals and plastics and can stand as high as a 40 story building. The blades turn the turbine which turns the gears and drives generators. The drawbacks are that wind needs steady winds and turbines can be noisy | **Solar** – converts light energy (sun) to electricity by the sun shining on solar cells. This moves electrons to produce current which is used and stored for later use. Sunlight is unlimited but collecting sunlight is expensive. |  |

**Non-renewable Resources**

* **Nonrenewable resources** are resources that are being extracted and used at a much faster rate than the rate at which they were formed.
* **Fossil fuels (coal, oil, and natural gas),** Uranium used for Nuclear energy, diamonds, metals, and other minerals are nonrenewable.
  + **Fossil fuels** are remains from organisms that exist in a fixed amount and are burned for energy. Fossil fuels can only be replaced by processes that takes millions of years for them to form.

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| **Coal** – solid fossil fuels from buried and decayed plant material. People use surface mining to obtain coal. When burned coal produces byproducts that pollutes the waters | **Oil and natural gas** – are trapped in underground porous rock. We have to drill down to get to these resources. When burned at high temperatures, it releases energy. These resources contribute to air pollution (smog) and spills can be very costly and hard to clean up | **Nuclear** water is heated to make steam that turns turbine which drives generator. Water is heated by nuclear fission, the splitting of radioactive atoms (uranium) which gives off a lot of energy, and producing radioactive/radiation waste |

**What’s being done?**

* Conservation measures are necessary for nonrenewable resources because they are known for having a non-replenishing supply.
* We must protect, restore, and manage these resources so that they don’t get depleted and last as long as possible
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