



Science Virtual Learning

7th Grade Science

Renewable vs. Nonrenewable

Resources

May 6, 2020

7th Grade Science Lesson: May 6

Objective/Learning Target:

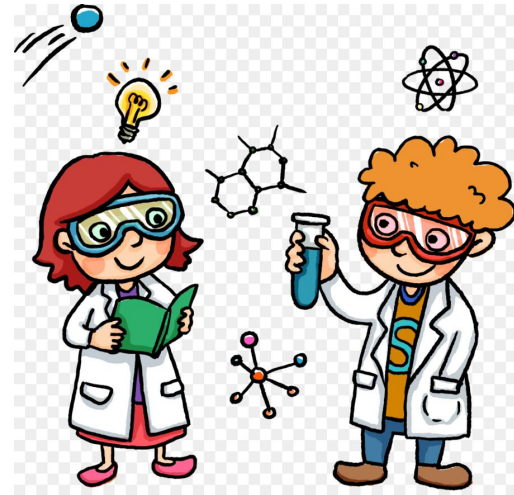
I can identify a variety of renewable and nonrenewable resources.



Warm-Up:

On a separate sheet of paper, write down what you think that the words “renewable” and “nonrenewable” mean. Can you think of at least two things on Earth that are renewable? What about two things that are nonrenewable?

Watch this [video](#) and see if you were correct!





Practice

Please write these definitions on your sheet of paper; you will need them later in the lesson.

Renewable resource- can be replaced at the same rate that the resource is being used. Examples include solar power, wind power, hydroelectric (water) power, geothermal (Earth's heat) power, biomass (plants and waste), air and water. They can regrow or be reproduced in a person's lifetime.

Nonrenewable resource-- is being made at a rate that is much slower than the rate it is being used. Examples include coal, oil, natural gas, nuclear power, and minerals. They take much longer than a person's lifetime to replace.



Practice continued

Now we are going to try and classify some natural resources as either RENEWABLE or NONRENEWABLE. Let's make a T chart on your paper, like this:

RENEWABLE RESOURCE	NONRENEWABLE RESOURCE



Practice continued

We are going to classify the following things:

Corn

Oil

Coal

Sunshine

Tides

Tuna

Gold

Hot Springs

Sands

Trees

Winds

Water

Natural Gas

Diamonds

Practice continued

Use these clues to help you decide if each of the items belong on the RENEWABLE RESOURCES side of your T chart or the NON - RENEWABLE RESOURCES side.

Clue 1.

On Earth, there are only limited amounts of fossil fuels such as oil, coal, and natural gas. There are also only limited amounts of minerals such as iron, copper, and phosphates. These resources either cannot be replaced by natural processes or require millions of years to replenish.

Clue 2.

Some nonrenewable and renewable natural resources can be recycled or reused. This process decreases the rate at which the supplies of these resources are depleted. For example, aluminum cans can be recycled and turned into new cans or other aluminum products many times over. Recycling reduces the need to mine bauxite, the mineral used to make aluminum. Another example is recycling oil. The motor oil from your vehicle can be reprocessed into fuels or re-refined into lubricating oils.

(continued on next slide)

Practice continued

Clue 3.

Renewable natural resources include plants, animals, and water, when they are properly cared for. Minerals and fossil fuels such as coal and oil, are examples of nonrenewable natural resources.

Clue 4.

Trees, wildlife, water, and many other natural resources are replaced by natural processes. Plants and animals can also be replenished by human activities. Water is continuously cycled and reused. Sunlight, wind, geothermal heat, tides, and flowing water are resources that are constantly or “perpetually” being renewed or restored.

Think you know what belongs on each side of your T chart? Click to check your answers!

Practice continued

Answers:

RENEWABLE RESOURCE

Corn
Sunshine
Tides
Tuna
Hot springs
Sands
Trees
Winds
Water

NONRENEWABLE RESOURCE

Oil
Coal
Gold
Natural gas
Diamonds



Practice continued

Now that we know what is a renewable and a nonrenewable resource, let's talk about the pros (the good) and cons (the bad).

We will look at four types of renewable energy: solar power, geothermal, hydropower, and wind power.

We will also look at four types of nonrenewable energy: coal, oil, natural gas and nuclear power.



Practice continued

You will be writing a 3-5 sentence paragraph on what you feel is the BEST source of power, using evidence. It can be either renewable or nonrenewable.

You will also be writing a 3-5 sentence paragraph on what you feel is the WORST source of power, using evidence. It can be either renewable or nonrenewable.

Discuss your opinion with your family; see what they think. Use the following slides to help you. An example is provided on slide 11--be sure to do your own work!



Practice (Example Paragraph)

In my opinion, the worst source of power would be nuclear power. Even though it doesn't produce greenhouse gases, it does create other forms of waste that we don't really dispose of in an environmental way. It is also a nonrenewable resource. It is harmful to both animals and humans. It also can be used by terrorist.

I feel that the best source of energy would be hydropower. First off, it is totally renewable. It doesn't produce any greenhouse gases, either. It is really expensive to build the dams, but I feel that the amount of electricity it produces outweighs this negative.

RENEWABLE

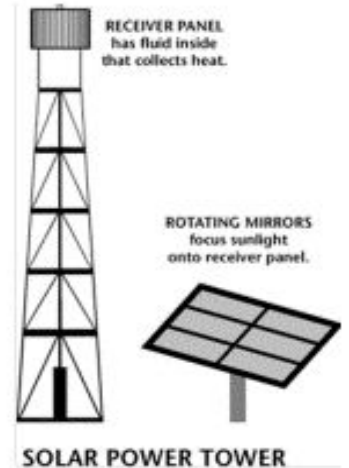
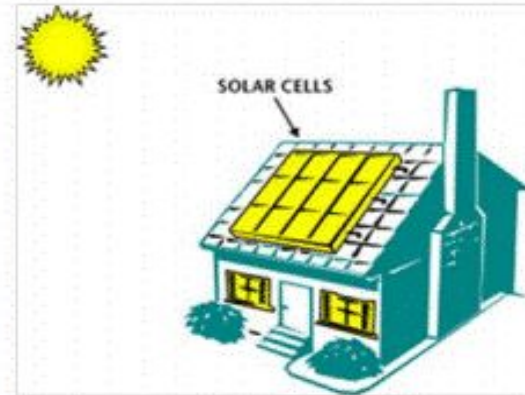
Solar Power - the sun's rays (solar radiation) that reach the Earth. This energy can be converted into other forms of energy, such as heat and electricity.

Pros:

- No greenhouse gases released
- When located on buildings have limited impact on environment
- Renewable

Cons:

- Expensive investment to install
- Not effective in areas with limited light



RENEWABLE

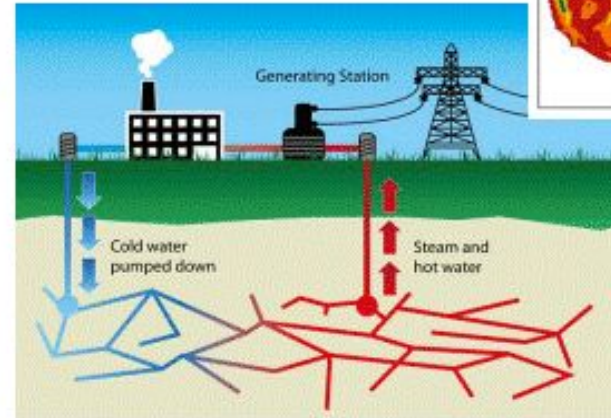
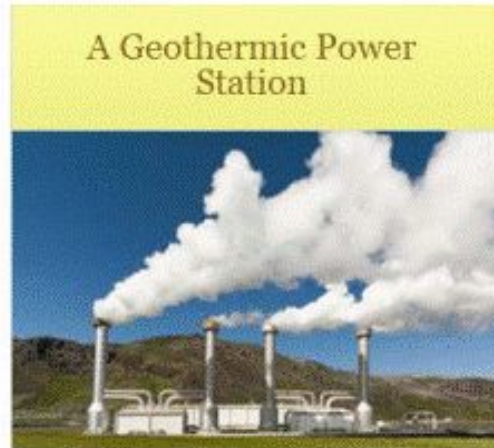
Geothermal - Temperatures hotter than the sun's surface are continuously produced inside the Earth by the slow decay of radioactive particles, a process that happens in all rocks.

Pros:

- Low greenhouse gas producer
- Renewable in some places
- Energy and cost efficient

Cons:

- Few geothermal fields that are not on protected land



RENEWABLE

Hydropower - energy from moving water

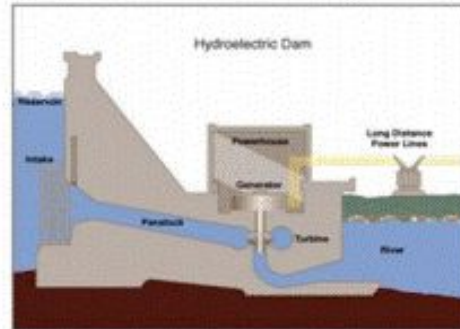
Pros:

- No greenhouse gases
- Can generate lots of electricity
- Renewable

Cons:

- Can damage environment where dam is built (can change the natural water temperatures, chemistry, flow characteristics, and silt loads, all of which can lead to significant changes in the ecology (living organisms and the environment) and rocks and land forms of the river upstream and downstream.
- Expensive to build

Fish Ladder at the Bonneville Dam on the Columbia River Separating Washington and Oregon



Top Hydropower Producing States, 2011



Source: U.S. Energy Information Administration, *Electric Power Monthly*, Table 1.13.B (February 2012).

RENEWABLE

Wind Power - wind turbines use blades, the wind flows over the blades creating lift, like the effect on airplane wings, which causes them to turn. The blades are connected to a drive shaft that turns an electric generator to produce electricity.

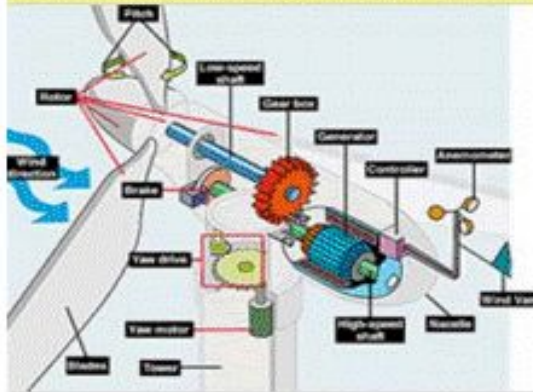
Pros:

- No greenhouse gases produced
- Renewable in some places

Cons:

- Limited to areas of reliable high winds
- High initial cost (but not as much as solar)
- Extensive land use
- Harms bats and migrating birds

Diagram of Windmill Workings



Top Wind Power Producing States, 2011



NONRENEWABLE

Coal - a combustible black or brownish-black sedimentary rock composed mostly of carbon and hydrocarbons. Most abundant fossil fuel produced in the U.S. The energy in coal comes from the energy stored by plants that lived hundreds of millions of years ago, when the Earth was partly covered with swampy forests.

Pros:

- Abundant
- High energy output

Cons:

- Non-renewable (it takes millions of years to create)
- Extraction is destructive to environment
- High greenhouse gas producer

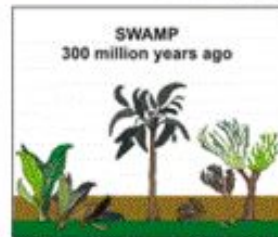
Top Coal Producing States, 2011



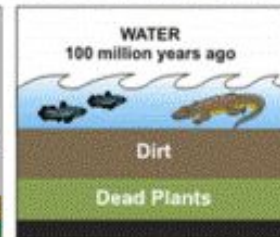
Source: U.S. Energy Information Administration, Quarterly Coal Report (June 2012).



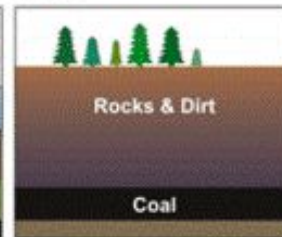
HOW COAL WAS FORMED



Before the dinosaurs, many giant plants died in swamps.



Over millions of years, the plants were buried under water and dirt.



Heat and pressure turned the dead plants into coal.

NONRENEWABLE

Oil (Petroleum) - Crude oil is a smelly, yellow-to-black liquid and is usually found in underground areas called reservoirs.

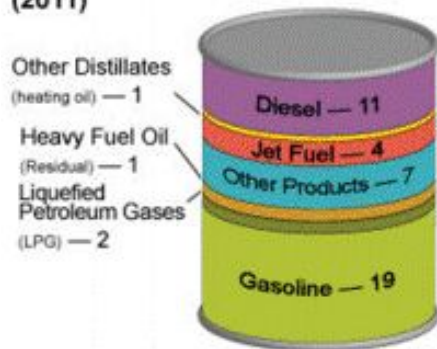
Pros:

- Easy to produce and transport
- High energy output

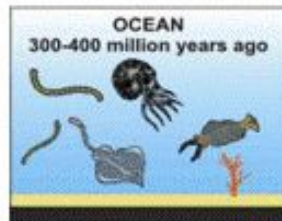
Cons:

- Non-renewable
- Region specific (causes lots of wars)
- Running out
- Environmental damage from spills
- High greenhouse gas (CO₂) producer

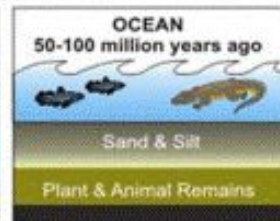
Products Made from a Barrel of Crude Oil (Gallons) (2011)



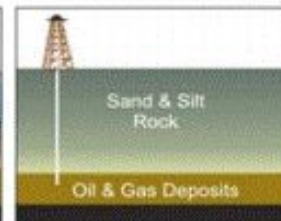
PETROLEUM & NATURAL GAS FORMATION



Tiny sea plants and animals died and were buried on the ocean floor. Over time, they were covered by layers of silt and sand.



Over millions of years, the remains were buried deeper and deeper. The enormous heat and pressure turned them into oil and gas.



Today, we drill down through layers of sand, silt, and rock to reach the rock formations that contain oil and gas deposits.

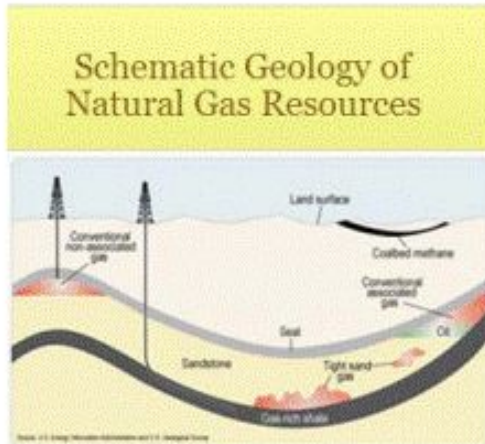
Natural Gas - main ingredient in natural gas is methane, a gas (or compound) composed of one carbon atom and four hydrogen atoms.

Pros:

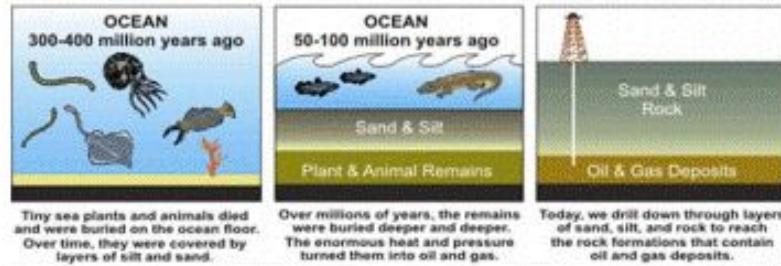
- Abundant
- Fewer greenhouse gases than coal or oil

Cons:

- Expensive to transport
- Greenhouse gas producer
- Non-renewable
- Many of the areas that are now being explored and developed for natural gas production are wilderness areas, and development of these areas have large impacts on the area's environment, wildlife populations.



PETROLEUM & NATURAL GAS FORMATION



NONRENEWABLE

Nuclear Power/Uranium - nuclear fission, atoms are split apart to form smaller atoms, releasing energy. Nuclear power plants use this energy to produce electricity.

Pros:

- No greenhouse gases
- Very efficient energy producer
- abundant

Cons:

- Expensive to build and maintain reactors
- Produces radioactive waste
- Difficult to dispose of waste
- Heated waste water is harmful to aquatic life
- Terrorism threat with spent fuel (nuclear weapons)

