

## APES Energy Review

The first thing you should know about energy is all of its **Forms**:

**Mechanical Energy:** Mechanical energy can be classified into 2 groups, potential energy (a cup sitting on your dinner table) or kinetic energy (a cup flying across your kitchen)

**Thermal Energy:** Heat / vibration and movement in atoms

**Chemical Energy:** stored in bonds between atoms in a molecule

**Electrical Energy:** Caused by the stimulation of electrons

**Nuclear Energy:** Stored in the nuclei of atoms. Released by splitting or joining atoms.

**Electromagnetic Energy:** travels by waves

Next, you should become familiar with the **Units of Energy**

**BTU (British Thermal Unit):** The amount of heat required to raise the temperature of 1 pound of water by 1 degree fahrenheit.

Ex. 1 watt is approx 3.4 btu/hr , 1 horsepower is approx 2540 btu / hr...

**Horsepower:** mostly used in the car industry. 1hp is equivalent to 746 watts

**Kilo-:**  $1,000 \times 10^3$  1kw =  $10^3$  watts

**Mega-(M):** 1,000,000 or  $10^6$  1megawatt =  $10^6$  watts

**Watt(Electrical):** used in power plants and home energy bills

**Watt(Thermal):** Nuclear power plants produce heat that is measured in thermal watts.

**Multiple Choice Review Questions:** Use a piece of paper or simply scroll so that the answers are not shown. Run through the quiz once taking note of the questions you answered incorrectly. Repeat those questions until you are the master of energy!

1.

Q: which fossil fuel energy source does the world have the largest supply of?

A: Coal

2.

Q: Most oil in the US is used for...?

A: transportation

3.

Q: One gallon of fuel produces 5 lbs of CO<sub>2</sub>. Two cars drive 100 miles each. The first gets 10 MPG. The second gets 25 MPG. How much LESS CO<sub>2</sub> is produced by the second car?

A: 30lbs

4.

Q: problems associated with the use of trees for biomass include the following

A: Soil erosion, Deforestation, Loss of habitat

5.

Q: which type of hydropower diverts water away from a stream or river and then feeds it back into it after a turbine is spun?

A: Run of the river system

6.

Q: These types of power plants are primarily responsible for acid deposition (including acid rain)

A: Coal power plants

7.

Q: the following are pollutants caused by burning coal

A: Sulfur dioxide, nitrous oxide and, particulate matter

8.

Q: what would decrease global greenhouse gas emissions?

A: Replacing coal plants with solar

9.

Q: Most of the energy that we use on Earth can be traced back to?

A: The sun

10.

Q: Passive solar design includes all of the following

A: Large windows on the south side of a house

Floors and walls that store heat

Overhang that blocks sun in summer but lets it in in winter

11.

Q: some of the ways to maximize our energy resources include the following

A: Energy efficiency and conservation

Better MPG Standards

12.

Q: The most underused form of acquiring energy is?

A: Hydroelectric

13.

Q: What is a possible downside to hydroelectric energy?

A: Startup cost

14.

Q: The major downside to hydraulic fracturing (fracking) is that?

A: Toxic chemicals can get into aquifer and water table

15.

Q: If Canada has a population of 35 million people and the annual consumption of petroleum in Canada is 12 barrels per capita, the total annual consumption is closest to?

A: 420 million

16.

Q: Which is NOT an example of biomass?

A: Petroleum

17.

Q: what is the earliest stage of coal? (this has the least amount of energy and is the youngest)

A: Peat

18.

Q: All renewable resources are derived from the sun in some way EXCEPT?

A: Geothermal

19.

Q: a downside to relying on biomass as a primary fuel source for a nation is that?

A: Soil erosion, water pollution & Habitat loss will occur

20.

Q: The main advantage to using natural gas as a fuel or to power industrial plants is that?

A: It burns cleaner and has less air pollutants

21.

Q: Which type of fuel produces the most sulfur?

A: Coal

22.

Q: Which region would have the greatest potential for solar technology?

A: 10 degrees north latitude

23.

Q: Which two things increase the amount of CO<sub>2</sub> in the atmosphere?

A: Burning fossil fuels and deforestation

24.

Q: What is an example of cogeneration?

A: Heat energy that is normally wasted is used to power a turbine

25.

Q: Ironically, most of the energy with an incandescent light bulb is converted to?

A: Heat energy

26.

Q: in most power plants what is the heat energy used for?

A: To create steam which turns turbines to create more power

27.

Q: Most of the developing countries in the world depend on \_\_\_\_\_ for their main source of energy?

A: Biomass

28.

Q: Due to energy being lost during production, transportation, etc. Coal-burning power plants are only about \_\_\_\_% efficient.

A: 35

29.

Q: which of these FOSSIL FUELS burns the cleanest?

A: Natural gas

30.

Q: Why don't we use vegetable oils or other biofuels for our transportation needs

A: Viscosity of the fuel isn't compatible with current engines, Not enough demand, buildup in engines.

31.

Q: In nuclear power plants, the \_\_\_\_\_ are used to prevent a meltdown during nuclear fission.

A: Control rods

32.

Q: Nuclear energy generates \_\_\_\_\_ waste instead of \_\_\_\_\_.

A: radioactive , air pollutants

33.

Q: If a 100 W incandescent bulb uses 400 kJ of energy per hour. How much would a CFL use that is 3 times as efficient IN 30 MINUTES?

A: 66kj

34.

Q: Which of the following would result in the greatest savings of gasoline?

A: Increasing mpg

