

*Unit 2 – Energy use and Conservation Cont'd*Ch 4 – Energy Use for a Sustainable Future**Section 4.1**

Global _____ Change is a _____ term change in the Earth's climate. These effects, being felt today, are the main driver for sustainable use of _____ resources around the globe.

*See the graphic on page 92. This shows how climate change effects result from a warming climate.

Warmer climate temperatures cause land and sea ice to _____, which in turn causes an _____ in sea level. This increase could cause more coastal _____.

As the temperature of seawater increases it becomes more _____ affecting coral reefs and other ecosystems.

A warmer climate also increases _____ of extreme weather events. These weather events such as hurricanes, floods, and _____ threaten human life across the globe.

Technology such as satellites and _____ is helpful in determining the effects of climate change. _____ based on current and past data can generate predictive climate situations. These are not without their flaws, but can give us a good idea of what might come given our _____ practices.

The greenhouse effect is a process that _____ outgoing infrared radiation in the earth's atmosphere, warming the earth.

Greenhouse _____ in the atmosphere absorb this radiation and hold heat. These gases are necessary for our atmosphere to _____ heat for us to live, but the imbalance of these gases is causing our climate to warm too much. Our current global average temperature is above _____. Without the greenhouse effect the average global temperature would be _____.

Page 96 table 4.1 shows principal greenhouse gases and human generated sources of these gases. ****Homework:** Memorize the four main greenhouse gases (carbon _____, methane, chlorofluorocarbons, and _____ oxide.)

A sustainable Energy System is one in which the perception, _____, and use of energy ensure that energy is sustainable. This system has the following characteristics:

1. The _____, production, and use of energy have limited impact on environment and human health.
2. There is less _____ on non-renewable resources
3. It ensures _____ of renewable and reliable energy resources for current and future generations
4. It provides access to _____ energy for the entire global population

Section 4.2 p. 100

On page 100 figure 4.7 shows the pyramid of sustainable use of energy. The lower level shows that every person can _____ energy by altering certain habits such as turning off _____, using less water, than closing the blinds on a hot summer day to keep your home cool.

The middle section refers to energy _____. Purchasing and using energy efficient light bulbs and appliances and securing proper _____ for your home can lead to sustainable energy use.

The top of the pyramid is _____ energy. This takes money, research and development, and a willingness to change our current lifestyle to move towards renewable energy use.

Page 101 table 4.2 shows efficiencies of common household devices. The most inefficient common household device is the incandescent light _____ converting only 5% of its electrical energy to visible light. The most efficient household appliance might be an electric heater, which converts _____ % of its electrical energy to thermal heat energy.

Energy conservation includes choices and changes in behavior that enable people to use _____ energy without sacrificing the services energy provides. (see p. 104 for a more comprehensive list of ideas on how to conserve energy)

_____ is an important part of sustainability. It is important to _____ the products we use that are inefficient, to _____ products for multiple purposes, and finally to _____ those things that can be broken down and used for other purposes.

_____ is a labeling system created by the Canadian government. It provides comparative information about the energy _____ for major appliances. Energy Star appliances meet or exceed strict energy efficiency criteria. For example, an energy star qualified natural gas furnace means it is over _____ % efficient.

R-value is a measure of the effectiveness of insulation. The higher the are value the greater its ability to withhold heat from passing through it. If your home is insulated well, very little heat will escape in the winter and very little heat will invade your cool house in the summer.

****Homework:** what energy saving devices does your home have? Some examples are skylights to allow natural light into a room, energy Star rated appliances, a programmable thermostat, motion sensing light switches, on demand water heaters, etc. Make the list in the space provided below!

Energy Efficiency in my home:

The _____ sector is Canada's largest contributor to climate change; it accounts for about _____% of all of Canada's greenhouse gas emissions. The greatest opportunity for Canadians to conserve energy is through transportation. Limiting the frequency and _____ traveled in a vehicle, using fuel efficient or _____ vehicles, and carpooling are just a few examples of conservation ideas in transportation.

_____ electric vehicles are powered by a combination of gasoline and battery power. Pure electric vehicles are only battery powered. What kind of fossil fuels are involved in generating electricity? Some of the electricity that comes through our household receptacles requires fossil fuels to generate.

****Homework** Research the fossil fuel use in generating electricity vs. the use in a gas powered vehicle. Is electricity really that efficient? Yes or no?? Show your explanation below.

_____ fuel cells create electric current that can run a motor in a vehicle. Hydrogen and Oxygen gas enter the fuel cell and _____ leaves the fuel cell as an end product. Canada is seen as a leader in fuel cell technology.

******On page 111 there are questions to help you guide your actions in moving toward sustainable future.

Sample questions include: How can I avoid over packaged in processed foods and beverages? How often do I have to travel? Can I avoid unnecessary travel in a motor vehicle? How can I conserve energy at home? Can I buy a more energy efficient products such as light bulbs and appliances? Can I consider Energy Star labels when I shop? How can I use less energy for recreation?

****Homework** Read each of these questions and ask yourself how you can change your lifestyle to be more energy sustainable. Record your ideas below.

****** on page 120 and 121 read about environmental science careers!

****Homework** find out what kind of furnace you have in your home. Is there in EnerGuide sticker on your furnace? What is its energy efficiency? Is it energy star rated? Ask your parents or caregivers to help you research your furnace!! Record your findings below

Submit this notes package, the answers to your homework questions above, and the text questions for your Ch 4 as n't!!

Ch 4 Textbook Questions: _____