**Energy**

**L3: Fuels and Alternative Energy**

Read sections 7I.1, 7I.2, and 7I.3 and answer the following questions.

7I.1

1. What is a fuel? What type of energy do they store?

Fuel is a substance that stores chemical energy that can be released as light and heat when combusted (burnt).

1. Describe the energy transfers in the following situations:
   1. Power station: chemical energy 🡪 kinetic energy 🡪 electricity
   2. Bunsen burner: chemical energy 🡪 heat and light
   3. Car engine: chemical energy 🡪 heat, kinetic, electrical and sound
   4. Candle: chemical 🡪 light and heat
2. What are the four main uses of fuels?

Transportation, heating, cooking, generating electricity

7I.2

1. Give three examples of fossil fuels.

Coal, natural gas, oil.

1. Describe how fossil fuels form.

Dead plants and animals are buried. Over millions of years the high heat and high pressure from being buried deep underground turn the animal and plant remains into fossil fuels.

1. How is coal different from oil and gas? (HINT: what are the formed from?)

Coal is formed from dead plants. Oil and natural gas are formed from dead animal remains.

1. How long does this process take?

Millions of years.

1. Explain how the energy stored in fossil fuels originally came from the sun.

Plants absorbed light from the sun during photosynthesis. Animals eat the plants. When the plants and animals die they store the energy as chemical energy which is passed to the fossil fuel.

1. What does non-renewable mean? Why are fossil fuels non-renewable?

Non-renewable means that it will eventually run out, that we cannot make more. Fossil fuels are non-renewable because they take millions of years to form which is too long.

1. What is the main use of fossil fuels? What type of energy is the chemical energy transferred into?

To generate electricity. Electrical energy.

1. Name three reasons why it is important to use less fossil fuels.

Reduce pollution which causes global warming and acid rain.

It will one day run out.

They are important to make materials like plastics.

1. How can we use less fossil fuels?

Use other ways of generating electricity.

Use devices that use less energy (energy efficient appliances).

Use less electricity.

7I.3

1. What does renewable mean?

Renewable means that it will not run out.

1. Complete the table with information about alternative energy resources

|  |  |  |  |
| --- | --- | --- | --- |
| Energy Resource | What is it?  How does it work? | Advantages | Disadvantages |
| Biomass | Biomass energy is used by burning plants or other organic waste (like animal waste) to release heat energy which can be used to generate electricity. | Renewable  Easy to do. | Releases carbon dioxide pollution. |
| Solar | Use the sun’s energy to generate electricity. | No pollution.  Renewable | Only works when it is sunny  Solar panels are expensive |
| Wind | Use wind’s kinetic energy to turn turbines to turn generators which generate electricity | No pollution  Renewable | Takes up a lot of space  Some people think they are ugly |
| Tidal | Use the rising and lowering of the tides caused by the moon to spin turbines, spinning generators, to generate electricity. | No pollution  Renewable | Difficult to build tidal power stations.  Only works in certain areas by the sea. |
| Wave | Use wave’s kinetic energy to turn turbines to turn generators which generate electricity | No pollution  Renewable | Difficult to build wave power stations.  Only works in certain areas by the sea. |
| Geothermal | Uses heat from deep in the Earth to heat water (can be used for heating).  Water turns to steam and turns turbine to turn generators to generate electricity. | No pollution  Renewable | Only works in volcanic areas. |