Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Harnessing Energy from Our planet**

**The Spheres of Our Planet:**

|  |  |
| --- | --- |
| **The hydrosphere** |  |
| **The Lithosphere** |  |
| **The atmosphere** |  |
| **The biosphere** |  |

**Renewable vs. Non-Renewable Energy:**

|  |  |
| --- | --- |
| **Renewable Energy** | * Energy from a source that is **not depleted** when used (does not get used up). |
| **Non-Renewable Energy** | * Energy from a source that is **not easily replaced** in nature. * Once the source gets used up, you will need to generate more in order to obtain energy from this source. * It may take thousands of years for these sources to replenish themselves. |

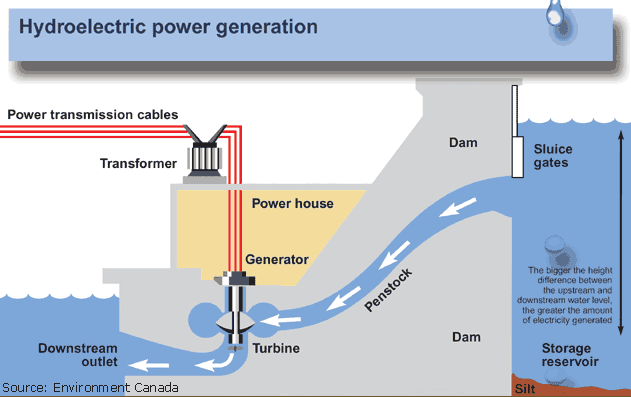
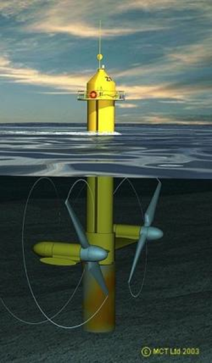
**Energy from the hydrosphere:**

Hydraulic energy: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**How do we obtain hydraulic energy?**

1. Hydroelectric power plants use the movement of falling water to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which are located inside \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. Water falling through a dam spins a turbine that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. Hydroelectricity is the main source of energy in Quebec.



**Wave Energy:**

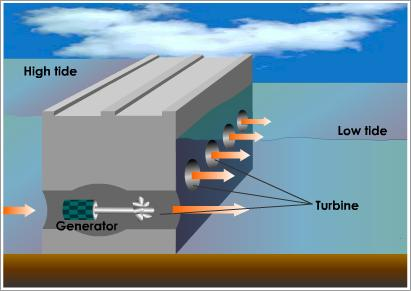
* Energy from the movements of currents.

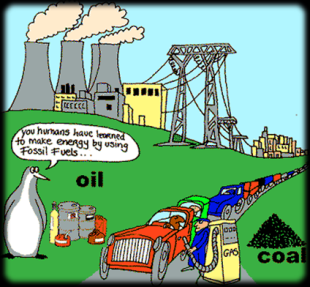
**How to obtain it?**

* 1. Wave energy is produced when the energy contained in the movement of water is harnessed using buoys, which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  2. Ocean currents are able to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which are similar to wind turbines.
  3. The mechanical energy produced by the movement of the buoys and blades can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy.

**Tidal Energy:**

* Electricity can be generated from tides when water from a high tide is collected (sometimes using a dam) and then falls through turbines converting mechanical energy into electrical energy are used.



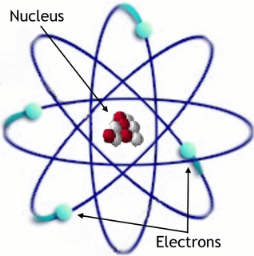
**Energy from the Lithosphere:**

**Fossil Fuels:**

* Fuels resulting from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* These energy sources consist \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* They form from the pressure of several layers of sediment over decaying organic matter.
* This process takes millions of years.

**How do we obtain it?**

1. The burning of fossil fuels releases a lot of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
2. This thermal energy is used to create \_\_\_\_\_\_\_\_\_\_\_\_ by boiling water.
3. The steam creates \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ connected to a generator.

**Uranium:**

* It is a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ that occurs naturally in the Earth’s crust.
* Splitting the nucleus of these atoms produces a lot of nuclear energy.
* What is nuclear energy? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* While nuclear energy does not release greenhouse gases such as in the burning of fossil fuels it has other consequences.
* What are the 2 main concerns surrounding the use of nuclear energy?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**How do we obtain it?**

1. By bombarding nuclei with particles or other nuclei moving at high speeds you can cause the decay/transformation of radioactive nuclei. (break them down)
2. This creates a large amount of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which is used \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by boiling water.
3. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which allows a generator to create electricity.

**Geothermics:**

* Geothermal energy is the energy \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Found mostly where hot rock is located near the Earth’s surface (near volcanoes for ex.)
* This is a renewable source of energy that can be used for heating houses.



**Energy from the Atmosphere:**

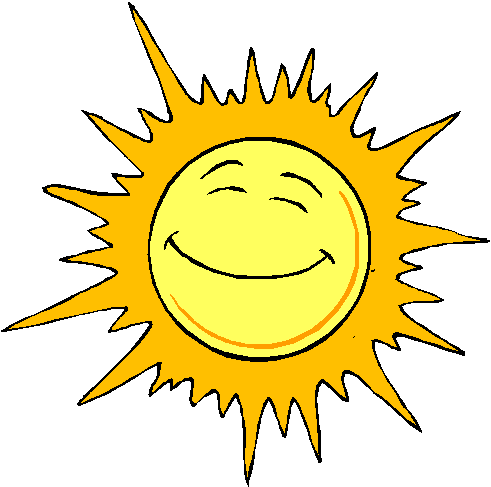
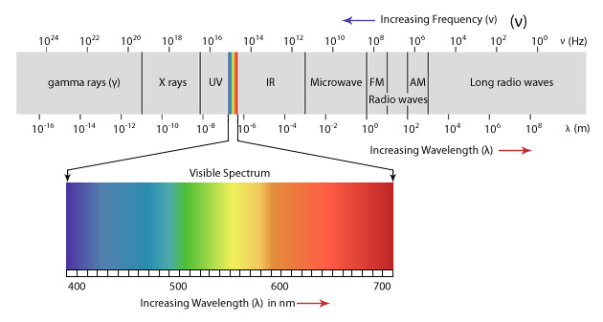
* **Wind Energy:** The Energy that can be drawn from the wind.

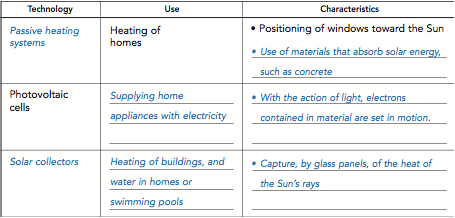
|  |
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| **Advantages:** |
| **Disadvantages:** |

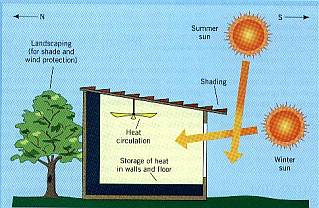
**How do we obtain it?**

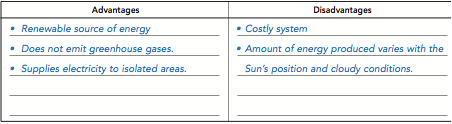
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**Solar Energy:**

* Solar energy is *the energy that comes from the Sun in the form of radiation through the atmosphere.*
* Composition: *75% hydrogen and 25% helium*







**So which is which?**

|  |  |
| --- | --- |
| **Renewable** | **Non-renewable** |
|  |  |