

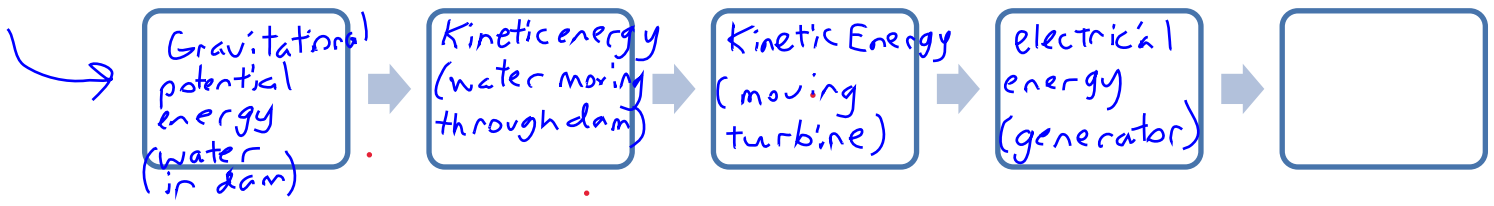
# S30 Unit D: Energy Conversions

1. All energy on Earth has at one time or another come from the Sun. Below, describe the energy conversions from solar energy to each of the following types of energy. (pg 536-555 and pg 481-489)

- a) Solar Energy → Wind Energy: *Sunlight heats air, causing it to rise, creating wind.*
- b) Solar Energy → Hydropower: *Sun drives the water cycle: water evaporates, forms clouds & fill hydro dams as rain.*
- c) Solar Energy → Chemical Potential Energy (Photosynthesis): *Sun is captured by plant cells that convert CO<sub>2</sub> & H<sub>2</sub>O into glucose.*
- d) Solar Energy → Coal: *(cont. from above) plants and glucose is converted over time into coal.*
- e) Solar Energy → Petroleum: *Similar to above.*
- f) Solar Energy → Natural Gas: *Similar to above.*

*example:  
hydro*

2. Each of these forms of energy can be further converted to electricity. Outline the energy transformation from one of these forms to electrical energy. (pg 500)



3. Every energy conversion technology has advantages and disadvantages. List one advantage and one disadvantage of each technology listed below. (pg 536-555)

active solar heating <i>(solar panels)</i>	advantage: <i>No emissions produced, Photovoltaic cells are long lasting</i>
	disadvantage: <i>sunlight is intermittent, so electricity needs to be stored. Not highly efficient.</i>

*or photovoltaic cells*

<p>South facing windows ↓ to heat homes</p> <p>passive solar heating</p>	<p>advantage:</p> <p>requires no "technology", produces no emissions.</p> <p>disadvantage:</p> <p>only heats home during sunlight hours.</p>
<p>wind turbines</p>	<p>advantage:</p> <p>produces no emissions, allow for less habitat disruption</p> <p>disadvantage:</p> <p>Not all regions have needed wind capacity.</p>
<p>hydroelectric power</p>	<p>advantage:</p> <p>High efficiency, no emissions.</p> <p>disadvantage:</p> <p>Land/Waterway disruptions</p>
<p>biomass</p>	<p>advantage:</p> <p>Good use of waste materials, renewable</p> <p>disadvantage:</p> <p>Still produces CO<sub>2</sub>, crops not used for food.</p>
<p>geothermal energy</p>	<p>advantage:</p> <p>NO emissions, can heat, cool, produce energy</p> <p>disadvantage:</p> <p>Not easily used in some areas low in geothermal potential.</p>
<p>hydrogen fuel cells</p>	<p>advantage:</p> <p>No emissions, very portable</p> <p>disadvantage:</p> <p>Hydrogen difficult to transport &amp; flammable.</p>