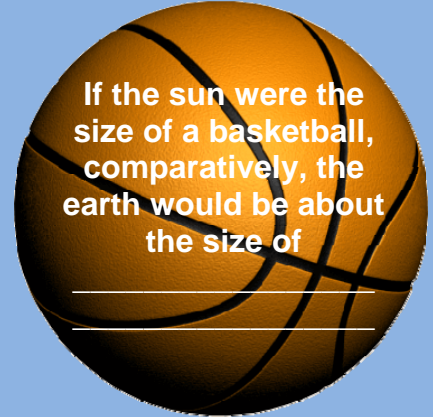


CGR4M0 Grade 12 Environmental and Resource Management
The Sun

FUN SUN FACTS

The sun is really just a _____

The sun is about _____
 years old and should last for about
 _____ more years.



The sun is about _____ km away.

It takes light about _____ to get here.



If you wanted to drive there at 80km/hr, it would take you about _____

Here is some basic information about solar energy and how the earth uses it.

Earth's Energy Budget

Incoming Solar Energy (100%)
Reflected by: Atmosphere (6%) Clouds (20%) Earth's surface (4%)
Absorbed by: Atmosphere (16%) Land and Oceans (51%)

What happens to the 51% that is absorbed by earth?
Transferred back into the atmosphere: - as latent heat by the evaporation of water (23%) - by heated rising air (7%)
Radiated directly back into space (6%)
Transferred into the atmosphere by radiation, then reradiated into space (15%)

The heat from the solar energy creates other forms of energy through wind, precipitation, ocean currents, and photosynthesis.

Air masses above the surface of the earth are heated causing them to rise. An area of low pressure is created below the rising air mass allowing air from areas of higher pressure to be drawn in. Wind results from this movement of air. The greater the variation in pressure between the areas of high and low pressure will determine the velocity of wind.

As these air masses are heated, evaporation of water also occurs. As this moisture-laden air rises, it cools and the water vapour condenses, forming clouds. If the conditions are suitable, precipitation will result.

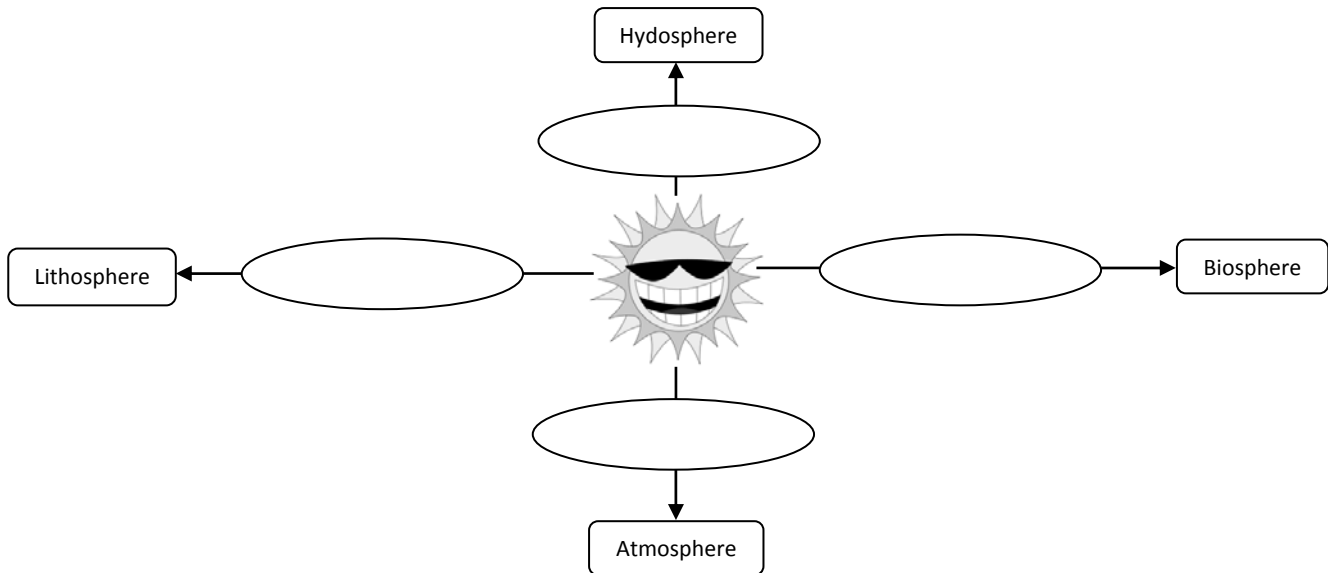
The oceans in the equatorial area are heated to a greater degree than other regions. In an attempt to equalize the temperatures, the earth moves this heat from the tropical areas pole ward. Likewise, the cold water from the poles travels in the direction of the equator. An example of a warm current is the Gulf Stream that moderates the temperatures of North America's east coast as well as parts of Europe. The cold Labrador Current travels from the Davis Strait in the Canadian Arctic to Newfoundland where these two currents meet and affect the climate of that area.

Photosynthesis is the process that causes plants to grow and change the sun's energy into food energy that animals eat. Millions of year ago, during the Mesozoic era of geologic time, a large area of what would become the southern prairies in Canada was much different than it is today. Conditions were tropical and large amounts of vegetation and animals existed on the shores of inland seas. As this plant and animal life died and decayed, it eventually became the fossil fuels that we now associate with Alberta.

A small amount of the earth's energy comes from non-solar sources.

- Geothermal (0.013%) heat from within the earth's surface
- Tides (0.002%) caused by the gravitational influences of the sun and moon.
- Waste heat from fossil fuel consumption (0.007%)

Basic Influences of the Sun on the Four Spheres



So, in summary, the influences of the sun on the spheres through these processes will result in further impacts on each of the other spheres:

- Atmosphere: Winds creation of weather systems
- Hydrosphere: Precipitation increase in the amount of water torivers
- Lithosphere: Heat rocks subjected to mechanical weathering
- Biosphere: Photosynthesis plant growth

Go back to the chart on the first page. Your assignment is to design a chart, graph, web diagram (or any other graphic) to better show earth's energy budget.