Name: _____
Class: _____

Science 10

Climate

Energy Flow in Global Systems

1. Define the followin ıd give an example of each:

   - Open system

   - Closed syste

   - Isolated sys

2. Using the same classifications, a cell would be a(n) _____ system.
   a) Open
   b) Controlled
   c) Isolated
   d) Closed

3. The atmosphere contains _____ gas, _____ gas and other gases.

4. All of the land on the earth is collectively known as the _____.

5. All of the water on the earth is collectively known as the _____.

6. The Earth's surface is _____ % water and _____ % land.

7. The term biosphere refers to:
   a) All aquatic environments on Earth.
   b) All terrestrial environments on Earth.
   c) The tropical rainforest ecosystems on Earth.

d) All of the environments on Earth that support life.

8. The cryosphere is made up of:

a) All water on Earth
b) All deep ocean water that never cycles to the surface.
c) All of the frozen water on Earth.
d) All of the water that is evaporated in the atmosphere.

9. How does Earth maintain its relatively constant average temperature

10. Define radiation budget:

11. Radiation reaching the Earth can be either reflected, scattered or absorbed.

Darker surfaces _____ the radiation while lighter surfaces

_____ the radiation.

12. Define albedo and give an example of a surface that has a high albedo.

13. The Earth is continuously receiving energy from the Sun in the form of radiation. Most of this radiation comes in what 3 forms?

a) Microwaves, Ultraviolet Waves, X-Rays.
b) Infrared Waves, Visible Light, Ultraviolet Waves
c) Infrared Waves, Visible Light, Gamma Rays.
d) Radio Waves, Visible Light, Ultraviolet Waves.

14. The Earth in turn re-radiates a portion of the energy that it receives from the Sun. What is the form of most of this re-radiated energy?

a) Microwaves
b) Ultraviolet Radiation
c) Infrared Radiation
d) Visible Light

15. The phrase, "Earth's Radiation Budget" applies to:

a) The difference between the amount of energy from the Sun that reaches Earth's atmosphere and the amount of energy that is reflected or re-radiated from Earth into space.
b) The balance between the energy from the Sun arriving at Earth's atmosphere and the energy reflected by Earth and the atmosphere as well as the energy re-radiated by Earth into space.
c) The balance between the energy from the Sun that is absorbed by Earth and the energy radiated by Earth into space.
d) The difference between the solar energy absorbed by the atmosphere and by Earth's surface.

16. List seven different greenhouse gases.

17. Describe how the greenhouse effect causes the atmosphere to warm.

18. The Earth's atmosphere consists of many different gases in varying quantities. Which of gases in the following list fall into the category of greenhouse gases?

1. Carbon Dioxide
2. Carbon Monoxide
3. Methane
4. Nitrous Oxide
5. Ozone
6. Chlorofluorocarbons
7. Oxygen

a) 1, 3, 4, 5, 6
b) 2, 3, 4, 5, 6
c) 1, 2, 3, 6, 7
d) 1, 3, 4, 5, 7

19. The term "Greenhouse Gases" refers to gases that:

a) Absorb the light from the Sun.
b) Does not allow heat to pass through it.
c) Reacts with pollution to create heat.
d) Absorb infrared radiation and convert it into heat.

20. Define climate and weather. What is the difference between these terms?

21. Which parts of the Earth have the longest/shortest days? Explain why this is.

22. In what month is the Earth closest to the sun, farthest from the sun as it relates to the seasons?

23. Here in Alberta, the lengths of our day and night change with the seasons. This phenomenon occurs because:

a) The Earth's orbit around the Sun is not circular and at different times of the year it is further away than at other times.

b) During different times of the year, the Earth rotates at different speeds.

c) The tilt of the Earth's axis causes a change in the angle at which light from the Sun hits different locations on Earth at different times of the year.

d) Average cloud cover is higher during the winter months and this accounts for less daylight.

24. Explain why only about 50% of the solar energy that reaches the outer atmosphere is absorbed by the Earth's surface.

Distributing the Heat

1. List two reasons why the oceans are such large heat reservoirs.

2. Ocean currents have a _____ on the weather in coastal areas.

3. What is the Gulf Stream?

4. Describe the El Nino and La Nina.

5. In Canada the wind generally move from _____ to _____.

6. At a very basic level, winds are created by:

- **a)** The rotation of the Earth that causes the air above the surface to be pulled along.
- **b)** Warm air rushing in to fill the void left by cool air rising.
- **c)** Cool air rushing in to fill the void left by warm air rising.
- **d)** Bursts of solar radiation that wash over the Earth's surface displacing the atmosphere.

7. An area of low pressure occurs as

8. High Pressure occurs as

9. Explain the Coriolis effect.

10. The Coriolis effect applies to any body moving on or above _____ such as _____ and _____ currents.

11. Earth's rotational motion influences

12. Define the "Jet Stream".

13. The jet stream is best defined as:

a) Currents of fast moving air at high altitudes that form along the junctions of the Easterlies and the Westerlies.

b) The disrupted air left behind as a plane passes.

c) Currents of fast moving air that form along the equator.

d) Currents of fast moving air also know as Easterlies and Westerlies.

14. Sketch how convection currents distribute heat around our planet.(Figure 10.24)

15. Sketch a Sea Breeze and a Land Breeze.

Sea Breeze	**Land Breeze**

16. As the Sun rises over coastal regions, the following air current is produced:

a) A land breeze results as air blows in from over the water.

b) A sea breeze results as air blows in from over the water.

c) A land breeze results as air blows out over the water.

d) A sea breeze results as air blows out over the water.

17. As air moves up over mountain ranges it produces a specific type of precipitation called:

a) Mountain precipitation.
b) Plateau precipitation
c) Orographic precipitation
d) Chinook precipitation

Match the following with the next 5 questions.

a) Cryosphere
b) Hydrosphere
c) Lithosphere
d) Trophosphere
e) Stratosphere

18. ___ Consists of the water in oceans, rivers, lakes, streams, underground reservoirs, and the atmosphere.

19. ___ Consists of the water that is temporarily frozen in polar ice caps, snow, permafrost and glaciers.

20. ___ Consists of the Earth's crust both above and below the ocean.

21. ___ Consists of the majority of the atmosphere and is located between 0 and 12 km from the Earth's surface.

22. ___ Consists of the atmosphere that is located between 13 to 50 km from the Earth's surface.