

## The Atmosphere

- The atmosphere is the blanket of air and moisture that surround the Earth.
- The atmosphere is densest at \_\_\_\_\_ and becomes less dense as the height above sea level \_\_\_\_\_.
- The atmosphere consists of: \_\_\_\_\_ (78%), \_\_\_\_\_ (21%), and \_\_\_\_\_ (1%).

## Atmospheric Layers

- Each layer of the atmosphere has distinct properties.
- \_\_\_\_\_ is the height above sea level, usually measured in metres (m) or kilometers (km).
- All of the layers are thicker above the \_\_\_\_\_ than they are above the \_\_\_\_\_.

## The troposphere

- The atmospheric layer closest to the Earth's surface.
- The troposphere is \_\_\_\_\_ km thick at the equator and \_\_\_\_\_ km thick at the poles.
- Contains most of the atmosphere's \_\_\_\_\_ and is responsible for most of our \_\_\_\_\_.
- \_\_\_\_\_ decreases with increasing altitude.
- Temperature ranges from \_\_\_\_\_ °C to \_\_\_\_\_ °C.

## The tropopause

- Thin boundary where the \_\_\_\_\_ ends.
- Temperature no longer decreases with increasing \_\_\_\_\_.
- The temperature rises because the tropopause contains more \_\_\_\_\_, which absorbs \_\_\_\_\_ from the sun.

## The stratosphere

- \_\_\_\_\_ atmospheric layer.

- The stratosphere reaches from \_\_\_\_\_ km to \_\_\_\_\_ km.
- This layer has higher concentrations of \_\_\_\_\_ than any other layer.
- Ozone helps protect the Earth from much of the harmful ultraviolet radiation from the \_\_\_\_\_.
- The temperature in the stratosphere is about \_\_\_\_\_ °C.

### The mesosphere

- The \_\_\_\_\_ layer of the atmosphere.
- Density of gases in this layer is extremely \_\_\_\_\_.
- Extends from \_\_\_\_\_ km to \_\_\_\_\_ km.
- The temperature in the mesosphere is about \_\_\_\_\_ °C.

### The thermosphere

- The temperature in the thermosphere is about \_\_\_\_\_ °C.
- The thermosphere has low \_\_\_\_\_ but the molecules have high \_\_\_\_\_.
- The highest-energy \_\_\_\_\_ waves from the Sun are absorbed in this layer.
- Extends from \_\_\_\_\_ km to \_\_\_\_\_ km.
- The \_\_\_\_\_ occur in this layer.

### The exosphere

- This is the thin \_\_\_\_\_ layer of the atmosphere.
- “\_\_\_\_\_” – there are very few particles in this layer, and what particles there are (mostly hydrogen) are very \_\_\_\_\_.

\_\_\_\_\_ - change of temperature over a distance.

The temperature gradient for the troposphere is about \_\_\_\_\_ for every 1000 m.

Eg. 3000 m up, it is 18°C colder than it is at sea level.

## Supporting Life

- Life as we know it would not be possible without the \_\_\_\_\_.
- \_\_\_\_\_ and \_\_\_\_\_ in the atmosphere are needed to support life.
- \_\_\_\_\_ is needed for green plants to thrive.
- \_\_\_\_\_ in the upper atmosphere absorbs ultraviolet radiation and protects us from the sun.
- The atmosphere plays a role in the \_\_\_\_\_.
- The atmosphere helps keep the average \_\_\_\_\_ within a life-supporting range.
- The atmosphere circulates \_\_\_\_\_ to help maintain a fairly constant balance of energy around the world.

## Atmospheric Pressure

- \_\_\_\_\_ is the pressure that air exerts as gravity pulls it toward the centre of the Earth.
  - It is greatest at \_\_\_\_\_ where the particles are closest together.
  - At higher levels, pressure \_\_\_\_\_.
- \_\_\_\_\_ - a measure of the amount that the atmospheric pressure changes across a distance.
- Pressure gradients can be \_\_\_\_\_ or \_\_\_\_\_.
- Atmospheric pressure decreases rapidly as the altitude \_\_\_\_\_ sea level increases (vertical).
- \_\_\_\_\_ pressure gradients can be represented by using lines of \_\_\_\_\_. (figure 4 (b), pg. 512 in your text). The gradient is greatest when the lines are \_\_\_\_\_.
  - These types of lines are used on \_\_\_\_\_ to designate high- and low-pressure areas.
- Atmospheric pressure is stated in \_\_\_\_\_ (kPa). Since kilo means 1000, 1 kPa = 1000 Pascals (Pa).
- Eg. Pressure of 100 kPa is the same as 100 000 Pa.

- The most common instrument used to measure atmospheric pressure is the \_\_\_\_\_.
  - This instrument consists of an enclosed container with thin metal walls that are sensitive to \_\_\_\_\_. A needle attached to the container indicated the pressure.

### Exploring the Atmosphere

- To observe features high in the atmosphere, scientists launch \_\_\_\_\_ that carry a radiosonde, an instrument that measures \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.

## The Hydrosphere

- The hydrosphere includes all of the Earth's water, both \_\_\_\_\_ and \_\_\_\_\_.

### Water distribution in the hydrosphere

- \_\_\_\_\_% of water on Earth is salt water.
- Of the \_\_\_\_\_% of water that is fresh water, 87.3% are in \_\_\_\_\_ and \_\_\_\_\_, 12.3% is \_\_\_\_\_, and 0.4% is \_\_\_\_\_ and \_\_\_\_\_ water.
- Of the 0.4% that is surface and atmospheric water, \_\_\_\_\_% is in lakes, \_\_\_\_\_% is in the atmosphere, and \_\_\_\_\_% is in rivers.
- Canada has \_\_\_\_\_% of the world's fresh water supply and only \_\_\_\_\_% of the world's population.

## The Water Cycle

- Because much of the Earth's surface is covered by water, \_\_\_\_\_ systems depend greatly on water and its 3 states: \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
  - Energy causes water to \_\_\_\_\_ (from liquid to gas) or ice to \_\_\_\_\_ (solid to gas).
  - \_\_\_\_\_ rises and eventually condenses (gas to liquid) into \_\_\_\_\_, \_\_\_\_\_ and \_\_\_\_\_.
  - The resulting \_\_\_\_\_ falls to the ground, and the cycle starts again.

## The hydrosphere and human habitat

- \_\_\_\_\_ is vital to human survival.
- A large portion of the world's population lives near water (oceans or lakes).
- Weather systems on or near the water affect many people.