

Air Masses

Air mass – large body of air that takes on the characteristics of the land over which it formed.

- **Maritime Polar – Cold and wet**
- **Maritime Tropical – Warm and wet**
- **Continental Arctic – Bitterly cold & Dry**
- **Continental Polar – Cold and Dry**
- **Continental Tropical – Warm and Dry**

Weather Fronts

- **Cold Front – Storms – Blue Triangles**
- **Warm Front – Gentle rain/snow – Red semi -circles**
- **Stationary Front – Several days of rain, snow, or fog – alternating blue triangles and red semi-circles**

- **Occluded Front** – Heavy rain or snow, followed by drier air – alternating purple triangles and semi-circles.

Air Pressure

Air Pressure – weight from air molecules pressing down on Earth.

- **High altitudes** – less air molecules – lower pressure
- **Low altitudes** – more air molecules – higher pressure
- **Hot regions** – air molecules spread out, become less dense and rise → low pressure
- **Cold regions** – air molecules become more dense and sink → high pressure

Wind – air moving from areas of high pressure to areas of low pressure. Greater difference in pressure creates stronger winds.

Sea Breeze – air over land becomes hot and rises, cooler air from over the sea flows in to replace the rising, hot air.

Global Wind System

- **Convection Cells – Hot air rises, cools, and then sinks.**
 - **Areas where the hot air rises become low pressure systems**
 - **Areas where the cool air sinks become high pressure systems**
 - **Air always travels from high pressure systems towards low pressure systems – creating surface winds**
- **Major convection cells –**
 - **Hadley cell -equator – 30⁰ latitude**
 - **Ferrel cell – 30⁰ latitude to 60⁰ latitude**
 - **Polar cell – 60⁰ latitude to each pole**

- **Rainforests** – At the equator there is more ocean than land, so, air contains lots of moisture. As it rises, the water vapor cools, condenses, and precipitates, resulting in lots of rain.
- **Deserts** – At 30⁰ latitude, the sinking air is very dry because it already lost nearly all of its water vapor.
- **Coriolis Effect** – Apparent shift of winds or currents due to the rotation of Earth.
 - Shifts to right in northern hemisphere
 - Shifts to left in southern hemisphere

Global Wind Systems – Winds that blow in a consistent direction due to a combination of Earth's convection cells and the Coriolis Effect.

- **Trade Winds – From Equator to 30⁰ latitude (from east to west)**
- **Prevailing Westerlies – From 30⁰ latitude to 60⁰ latitude (from west to east)**
- **Polar Easterlies – From 60⁰ latitude to the poles (from east to west)**

Jet Streams – High altitude winds due to differences in temperature between air masses.

- **Always flow from west to east**
- **When the polar jet stream dips into lower latitudes, we experience major cold spells.**