Air mass formation occurs when a large body of air remains over a specific region for an extended period, taking on the characteristics of that region. This process involves:

1. Solar heating: The sun heats the Earth's surface, warming the air closest to the ground.

2. Expansion and rise: Warm air expands and rises, creating an area of low pressure near the ground.

3. Replacement: Cooler air moves in to replace the risen air, creating a circulation pattern.

4. Cooling and sinking: As the air rises, it cools, eventually sinking back to the ground, creating a high-pressure system.

5. Homogenization: The air is mixed and homogenized, taking on the characteristics of the region.

Classification of air masses is based on their temperature and humidity properties, which are influenced by the region they form over. The main types of air masses are:

- Polar (P): Formed over polar regions, characterized by cold temperatures and low humidity.

- Tropical (T): Formed over tropical regions, characterized by warm temperatures and high humidity.

- Continental (c): Formed over land, characterized by low humidity and temperature extremes.

- Maritime (m): Formed over oceans, characterized by high humidity and moderate temperatures.

These air masses can be further classified as:

- Arctic (A): Extremely cold and dry, formed over Arctic regions.

- Antarctic (AA): Extremely cold and dry, formed over Antarctica.

- Equatorial (E): Very warm and humid, formed near the equator.

These classifications help understand the characteristics of air masses and their impact on weather patterns.