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Lesson 3 Climates and Ecosystems

Lesson Summary

Climate and Weather

Weather is the condition of the air and sky at a certain time and place. **Climate** is the average weather of a place. That average is taken over many years.

Precipitation and temperature are key features of both weather and climate. Precipitation is water that falls to the ground. It can be in the form of rain, snow, sleet, or hail. Temperature measures how hot or cold the air is.

Why Do Temperatures Differ?

Areas near the North and South Poles are called the polar zones. In these areas, the sun is always low in the sky, so it is relatively weak. Temperatures range from cool to bitterly cold. The **tropics** are wide bands just north or south of the Equator. These areas are usually hot year-round because the sun is nearly overhead, where it is stronger. Between the polar zones and the tropics are the **temperate zones**. These areas have hot summers and cold winters.

Temperature is also affected by altitude, or the height of a place above sea level. As altitude increases, the temperature drops. The air is cool or cold in high mountains even in the tropics.

How Does Water Affect Climate?

Ocean currents act like large rivers within the oceans. Some move warm water from the tropics toward the poles. Other currents move cool water from the poles toward the tropics.

Water takes longer to heat or cool than land. As a result, during the summer, areas near an ocean or lake will be cooler than inland areas.

Water moves from Earth's surface into the atmosphere and back again. This movement is called the **water cycle**. Water on Earth's surface is heated by the sun and evaporates to become water vapor. As this vapor rises into the air, it cools. When that happens, the water changes back to a liquid. Eventually it falls back to Earth as precipitation.

Air Circulation and Precipitation

Belts of rising and sinking air form a pattern around Earth. Hot air rises near the Equator. It cools and sinks at the edge of the tropics. Hot air rises in the temperate zones, and sinks over the poles. Air also blows along the surface, forming winds from places where air is sinking to places where it is rising.

Precipitation is heaviest near the Equator and along coasts. Most storms occur when two air masses of different temperatures or moisture contents meet. A **tropical cyclone**, such as a hurricane, is a very strong rainstorm with high winds. These storms form over oceans in the tropics.

Types of Climate

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Temperatures are warmest in and around the tropics and are coolest close to the poles. Precipitation is greatest near the Equator. These patterns create world climate regions—areas that share a similar climate.

Biomes and Ecosystems

Regions on Earth with similar groups of plants and animals are called **biomes**. An **ecosystem** is a group of plants and animals that depend on one another and the same environment. The type of ecosystem that exists in a region depends mainly on the region's climate.