**The Role of Climate**

**Climate vs. Weather**

**Weather** is the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of Earth’s atmosphere at a particular **\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_**

- The weather in Regina could be sunny and warm one day, and cold and cloudy the next.

**Climate** refers to the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of temperature and precipitation in a particular region.

* Climate is caused by a combination of factors including the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in the atmosphere, the **\_\_\_\_\_\_\_\_\_\_\_\_**, the transport of heat by **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, and the amount of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in a region. The shape and elevation of the land also contributes to the local climate and global climate patterns.

**The Greenhouse Effect**

* The gases that are trapped in the atmosphere act like **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in a greenhouse. They cause the heat to stay within the atmosphere. Without the greenhouse effect, the earth would be about **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** cooler on average.

**The Effect of Latitude on Climate**

Earth is a sphere that is spins on a **\_\_\_\_\_\_\_\_\_\_\_\_** axis, which means that solar radiation strikes different parts of the earth at an angle that **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** throughout the year. At the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,** the sun is directly **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** at noon all year, whereas at the North and South **\_\_\_\_\_\_\_\_\_\_\_\_**, the sun is much **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in the sky for months at a time.

As a result of differences in **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and thus the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, Earth has three main climate zones:

* **\_\_\_\_\_\_\_\_\_\_\_\_ zones: \_\_\_\_\_\_\_\_** areas where the sun’s rays strike Earth at **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** angle. These zones are near the North and South **\_\_\_\_\_\_\_\_\_,** between **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_;** both North and South.
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ zones:** between the polar and tropical zones. The temperature in these zones ranges from **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, depending on the **\_\_\_\_\_\_\_\_\_\_\_\_**. This depends on the changing angle of the sun over the course of the year.
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ zones:** the area near the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,** between **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** latitudes. The tropics receive direct or nearly direct sunlight year-round, making the climate **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

**Heat Transport in the Biosphere:**

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** heating of the earth’s surface affects currents in both wind and water; as air and water are **\_\_\_\_\_\_\_\_\_\_\_\_\_** at the **\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** near the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** near the equator tends to **\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** from the poles tends to **\_\_\_\_\_\_\_\_\_\_** toward the ground. The movement of these air masses, along with the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the earth, creates the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* **\_\_\_\_\_\_\_\_\_\_\_\_** currents are affected by the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,** density, and salinity (saltiness) or the oceans, as well as by the action of **\_\_\_\_\_\_\_\_\_**, the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the earth, and the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** on the bottom of the ocean.
* Wind and ocean currents create **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** patterns and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, and have major impacts on the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the world.
  + The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** Circulation is called the Global Conveyor Belt, and in particular it has huge effects on weather and climate around the world.

**What Shapes an Ecosystem?**

**Biotic and Abiotic Factors**

Ecosystems are influenced by a combination of biological and physical factors.

* The biological influences on organisms within an ecosystem are called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
* Biotic factors include **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** things) with which an organism might interact.
* Physical, or **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, factors that shape ecosystems are called **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

**\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** factors include:

* + - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, humidity, wind, **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**,   
      soil type, sunlight
  + Biotic and abiotic factors determine the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of an organism and the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the ecosystem in which the organism lives.

**Habitat and Niche**

The area where an organism lives is called its **\_\_\_\_\_\_\_\_\_\_\_\_\_**. A habitat includes both **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** factors.

A **\_\_\_\_\_\_\_\_\_\_** is the full range of physical and biological conditions in which an organism lives and the **\_\_\_\_\_\_\_\_** in which the organism uses those conditions (it’s **\_\_\_\_\_\_\_\_\_\_\_** within the ecosystem).

* The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** that an organism needs to survive and its place in the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** are part of its niche.
* The combination of **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** factors in an ecosystem often determines the **\_\_\_\_\_\_\_\_\_\_\_\_** of different **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in that ecosystem.
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** can share the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in the same habitat.
  + Different species can occupy niches that are **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.

**Community Interactions**

Organisms living in the same ecosystem are constantly **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**. These community interactions can powerfully affect an ecosystem. There are three main types of interactions:

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** 
  + Competition occurs when **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (same or different species) attempt to use an ecological **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** at the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
    - Example: the **\_\_\_\_\_\_\_\_\_** & the great horned **\_\_\_\_\_\_\_\_\_** compete over their prey, the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Principle**: where **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** can compete for the same resources and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in the same **\_\_\_\_\_\_\_\_\_\_\_** in the same **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
    - This leads to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** (each species focusing on slightly different resources)
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:** 
  + Predation is the situation where one living **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** for another. The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is the organism obtaining the food, and the **prey** is the food source.
    - Example: **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** hunt down and eat **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**   
      Hawk = **\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, Prairie Dog = **\_\_\_\_\_\_\_\_\_\_\_**
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:**
  + Symbiosis is a relationship between two organisms that **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the two organisms.
  + Symbiosis means **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
    - These relationships means there is a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** between these species
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: **\_\_\_\_\_\_\_\_** species **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** from the relationship.
    - Examples:
      * **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and the plants they live in
      * **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and the flowers they pollinate
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: One organism **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and the other organism is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
    - Examples:
      * **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and bison; **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and sharks
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**: the organism **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** the host **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** instantly but may weaken and cause death later on.
    - Examples:
      * **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and other types of birds; **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in humans

**Ecological Succession**

The series of steps by which **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** to an area after a natural or human **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**Two Types of Succession:

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** succession:
  + Occurs when there is **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** on the land, usually after a major disturbance like a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** or bare rock is exposed when a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** has melted
  + Takes a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** for primary succession to progress due to the need to **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** first
* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ succession:**
  + When **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of the species in an area have been **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, but the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
    - Large **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**
    - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** that has been plowed and then abandoned
    - **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** after a building is demolished
  + Occurs **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** than primary succession
* Pioneer Species
  + **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and hardy **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** are the first species to come back after a disturbance.
* Climax Communities
  + The **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** of succession to an ecosystem. **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** are an example.

**Succession in Marine Ecosystems:**

* Succession can occur in any ecosystem, even in the permanently **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* In **\_\_\_\_\_\_\_\_\_\_\_\_**, scientists documented an unusual community of organisms living on the remains of a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
* The community illustrates the stages in the succession of a whale-fall community.
  + Succession begins when a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and sinks to the ocean floor.
  + Within a year, most of the whale’s tissues have been eaten by scavengers and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.**
  + The decomposition of the whale’s body **enriches** the surrounding sediments with **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**.
  + When only the **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**, heterotrophic bacteria **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** in the whale bones.
  + This releases compounds that serve as **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** for **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** autotrophs.
  + The chemosynthetic bacteria support a diverse community of organisms.