**Guided Notes: Interdependence of Organisms**

**Big Idea:** All living organisms in an ecosystem are interdependent, relying on each other and the environment through different symbiotic relationships and interactions.

**Key Concepts:**

• A \_\_\_\_\_\_\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_\_ relationship is where one organism (predator) hunts and eats the other (prey).

• \_\_\_\_\_\_\_\_\_\_\_\_ occurs when organisms compete for the same limited resources like food, water, shelter, etc.

• \_\_\_\_\_\_\_\_\_\_\_\_ describes close biological interactions between different species:

 - \_\_\_\_\_\_\_\_\_\_\_\_: Both species benefit (ex: bee pollinating a flower)

 - \_\_\_\_\_\_\_\_\_\_\_\_: One species benefits, the other is harmed (ex: tapeworm in a host)

 - \_\_\_\_\_\_\_\_\_\_\_\_: One species benefits, the other is unaffected (ex: remora fish on a shark)

**Real World Examples:**

1) Oxpecker birds riding on zebras and eating ticks/flies benefits the oxpeckers and removes pests from the zebras - this is an example of the \_\_\_\_\_\_\_\_\_\_\_\_ symbiotic relationship.

2) Two kids fighting over the last cookie at lunch period demonstrates \_\_\_\_\_\_\_\_\_\_\_\_ for a limited resource.

**Guided Notes: Relationships Among Organisms**

**Big Idea:** Living organisms interact with each other and their environment in various ways, forming interdependent relationships that are essential for the balance and survival of an ecosystem.

**Key Concepts:**

• In a \_\_\_\_\_\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_ relationship, one organism (predator) hunts and eats the other (prey).

• \_\_\_\_\_\_\_\_\_\_\_ are organisms that produce their own food, while \_\_\_\_\_\_\_\_\_\_\_ obtain food by consuming other organisms.

• \_\_\_\_\_\_\_\_\_\_\_ relationships benefit at least one organism involved:

 - \_\_\_\_\_\_\_\_\_\_\_: Both organisms benefit (ex: clownfish and anemone)

 - \_\_\_\_\_\_\_\_\_\_\_: One organism (parasite) benefits by harming the other (host)

• An organism that lives on/in and harms another is a \_\_\_\_\_\_\_\_\_\_\_, and the organism it lives on/in is the \_\_\_\_\_\_\_\_\_\_\_.

**Real World Examples:**

1) Your dog getting fleas or ticks is an example of the \_\_\_\_\_\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_ relationship, with the parasite benefitting by feeding on the host.

2) A bee pollinating a flower demonstrates \_\_\_\_\_\_\_\_\_\_\_, where both organisms benefit from the interaction.

**Guided Notes: Resource Scarcity and Survival**

**Big Idea:** The availability of resources in an ecosystem directly impacts the survival of organisms, often leading to competition when resources are scarce.

**Key Concepts:**

• \_\_\_\_\_\_\_\_\_\_\_\_ are the living and nonliving things an organism needs to survive in its environment.

• \_\_\_\_\_\_\_\_\_\_\_\_ occurs when the supply of a resource is limited or small.

• \_\_\_\_\_\_\_\_\_\_\_\_ happens when organisms require the same resources to survive, but the amounts are limited.

• Competition can occur between members of the same \_\_\_\_\_\_\_\_\_\_\_\_ when resources are scarce.

• Competition can also occur between different \_\_\_\_\_\_\_\_\_\_\_\_ that have overlapping resource needs.

• An \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is a species introduced to a new ecosystem, often outcompeting native species.

**Real World Examples:**

1) If there is only one slice of pizza left and you and your friend both want it, you are experiencing \_\_\_\_\_\_\_\_\_\_\_\_ for that food resource.

2) Forests with too many deer and not enough vegetation to feed them all demonstrates \_\_\_\_\_\_\_\_\_\_\_\_ of food, leading to increased \_\_\_\_\_\_\_\_\_\_\_\_ among the deer population.

**Guided Notes: Scarcity Affects Populations**

**Big Idea:** When resources become scarce in an ecosystem, it leads to increased competition among organisms and declining populations.

**Key Concepts:**

• A \_\_\_\_\_\_\_\_\_\_\_\_ is the area where an organism lives and gets the resources it needs to survive.

• A \_\_\_\_\_\_\_\_\_\_\_\_ is a group of the same species living in a specific area.

• \_\_\_\_\_\_\_\_\_\_\_\_ are the materials organisms need to survive, including food, water, shelter, etc.

• If resources are limited, it causes \_\_\_\_\_\_\_\_\_\_\_\_, forcing organisms to compete for scarce resources.

• This \_\_\_\_\_\_\_\_\_\_\_\_ leads to declines in the \_\_\_\_\_\_\_\_\_\_\_\_ size as some organisms cannot get the resources they need.

**Real World Examples:**

1) If a park ran out of food supplies for ducks, the ducks would experience \_\_\_\_\_\_\_\_\_\_\_\_ of food resources, causing \_\_\_\_\_\_\_\_\_\_\_\_ among them for the limited food.

2) After a forest fire, deer and other wildlife face \_\_\_\_\_\_\_\_\_\_\_\_ of food and shelter resources until the plants and trees regrow over time.

**Guided Notes: Physical Factors**

**Big Idea:** Changes in the non-living, abiotic components of an ecosystem can significantly impact the populations of organisms living there.

**Key Concepts:**

• A \_\_\_\_\_\_\_\_\_\_\_\_ is a group of the same species living in a specific area.

• \_\_\_\_\_\_\_\_\_\_\_\_ parts of an ecosystem include temperature, water, light, soil, etc.

• \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ refers to long-term shifts in temperature and precipitation patterns.

• Abiotic changes like warming temps can cause effects like \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_, harming coral reefs.

• Increased \_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ from absorbed CO2 makes ocean water acidic, damaging coral structures.

**Real World Examples:**

1) If a park's pond dried up due to drought (lack of water), the duck \_\_\_\_\_\_\_\_\_\_\_\_ living there would likely decline.

2) Rising temperatures forcing birds to shift their \_\_\_\_\_\_\_\_\_\_\_\_ ranges further north or to higher elevations.

**Guided Notes: Biological Factors**

**Big Idea:** Changes in the living (biotic) components of an ecosystem can significantly impact the populations of other organisms.

**Key Concepts:**

• \_\_\_\_\_\_\_\_\_\_\_\_ factors include plants, animals, fungi, bacteria, etc. that make up an ecosystem.

• Introducing a new \_\_\_\_\_\_\_\_\_\_\_\_ species can disrupt the balance by outcompeting native species.

• Removing an \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_, like wolves, causes impacts throughout the food chain.

• Humans impact biotic factors through \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_ and converting land to \_\_\_\_\_\_\_\_\_\_\_\_.

• \_\_\_\_\_\_\_\_\_\_\_\_ animals, like sharks, are crucial for maintaining balance in marine ecosystems.

**Real World Examples:**

1) A new invasive \_\_\_\_\_\_\_\_\_\_\_\_ species outcompeting native insects and birds for food/habitat.

2) Your family's \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ impacting natural habitats and food sources for wildlife.

**Guided Notes: Human Activity and Change**

**Big Idea:** Human activities can significantly impact and alter ecosystems and populations of organisms through habitat loss, pollution, resource use, introduction of invasive species, and climate change.

**Key Concepts:**

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is the removal of trees/forests, destroying natural habitats.

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_ from human industry, farming, and fossil fuels harms air, water, and soil quality.

• Overhunting, overfishing, and deforestation deplete \_\_\_\_\_\_\_\_\_\_\_\_\_\_ that organisms need.

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ introduced to new areas outcompete and harm native species.

• Rising \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ from greenhouse gas emissions disrupts ecosystems.

• \_\_\_\_\_\_\_\_\_\_\_\_\_\_ efforts like conservation laws and restoration projects aim to protect environments.

**Real World Examples:**

1) Clearing forests near your town for new housing developments is an example of \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

2) Your family's \_\_\_\_\_\_\_\_\_\_\_\_\_\_ consumption and vehicle emissions contribute to \_\_\_\_\_\_\_\_\_\_\_\_\_\_ change.

**Guided Notes: Claiming Factors Affect Populations**

**Big Idea:** Changes to the physical and biological components of an ecosystem can provide evidence to support claims about impacts on organism populations.

**Key Concepts:**

• A \_\_\_\_\_\_\_\_\_\_\_\_ is a statement declaring something to be true.

• \_\_\_\_\_\_\_\_\_\_\_\_ from observations and investigations supports a claim.

• Physical changes like \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ impact wetland habitats and species.

• Introducing an \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ is a biological change disrupting food webs/chains.

• Human activities like \_\_\_\_\_\_\_\_\_\_\_\_, \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_, etc. drive physical/biological changes.

**Real World Examples:**

1) A new \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ being built near your town will change the physical landscape/habitats.

2) Your family's use of \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_ involving spraying chemicals is a factor impacting local environments.