Food Chains and Webs Quiz Questions and Answers PDF

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What is the primary role of producers in a food chain?

- ◯ Decompose organic material
- ◯ **Produce energy through photosynthesis ✓**
- ◯ Store energy in the form of fat
- ◯ Consume other organisms

> Producers are organisms that create their own food through photosynthesis or chemosynthesis, forming the base of the food chain. They provide energy and nutrients for consumers in the ecosystem.

What percentage of energy is typically transferred from one trophic level to the next?

- ◯ 1%
- ◯ 50%
- ◯ 90%
- ◯ **10% ✓**

> Typically, only about 10% of energy is transferred from one trophic level to the next in an ecosystem. This is known as the 10% rule in ecology, which explains why higher trophic levels have fewer individuals and less biomass.

Which of the following is a primary consumer?

- ◯ Lion
- ◯ Mushroom
- ◯ Oak tree
- ◯ **Grasshopper ✓**

> Primary consumers are organisms that eat producers (plants) to obtain energy. Examples include herbivores like rabbits and deer.

How does human activity, such as pollution, impact food chains and webs?

Human activity, such as pollution, impacts food chains and webs by introducing toxins that can harm organisms, disrupt predator-prey relationships, and lead to declines in species populations.

How do decomposers contribute to nutrient cycling in an ecosystem?

De composers contribute to nutrient cycling by breaking down dead organisms and waste, releasing essential nutrients back into the soil for use by plants.

Discuss the significance of the 10% rule in energy transfer within an ecosystem.

The 10% rule signifies that when energy is passed from one trophic level to the next in an ecosystem, only approximately 10% of the energy is retained, while the rest is lost primarily through metabolic processes, heat, and waste.

What is the main function of decomposers in an ecosystem?

- ◯ Produce energy
- ◯ **Break down dead material ✓**

- ◯ Store nutrients
- ◯ Consume producers

> De composers play a crucial role in ecosystems by breaking down dead organic matter and recycling nutrients back into the soil, which supports plant growth and maintains ecological balance.

What is a keystone species?

- ◯ A species that is the most abundant in an ecosystem
- ◯ A species that is always at the top of the food chain
- ◯ A species that only eats plants
- ◯ **A species that has a disproportionate effect on its environment ✓**

> A keystone species is a species that has a disproportionately large impact on its environment relative to its abundance. Its presence or absence can significantly affect the structure and diversity of the ecosystem.

Which of the following are components of a food chain? (Select all that apply)

- ☐ **Producers ✓**
- ☐ **Consumers ✓**
- ☐ Photosynthesis
- ☐ **Decomposer ✓**

> A food chain consists of various components including producers, consumers, and decomposers, which interact in a linear sequence to transfer energy and nutrients through an ecosystem.

What roles do decomposers play in an ecosystem? (Select all that apply)

- ☐ **Breaking down dead organisms ✓**
- ☐ Producing energy through photosynthesis
- ☐ **Supporting plant growth ✓**
- ☐ Consuming producers

> Decomposer organisms, such as fungi and bacteria, play a crucial role in breaking down dead organic matter, recycling nutrients back into the ecosystem, and maintaining soil health.

Which organism is typically at the top of a food chain?

- ◯ Producer
- ◯ Secondary consumer

- ◯ **Tertiary consumer ✓**
- ◯ Primary consumer

> In most ecosystems, apex predators such as lions, eagles, or killer whales are typically at the top of the food chain, as they have no natural predators and play a crucial role in maintaining the balance of their environment.

Which statements about energy flow in ecosystems are true? (Select all that apply)

- ☐ **Energy flows in one direction ✓**
- ☐ Energy is recycled within the ecosystem
- ☐ **Energy decreases at each trophic level ✓**
- ☐ **Energy is lost as heat at each trophic level ✓**

> Energy flows through ecosystems in a one-way direction, from producers to consumers and eventually to decomposers. This flow is essential for maintaining the structure and function of ecological communities.

Which of the following best describes a food web?

- ◯ A single linear path of energy flow
- ◯ A cycle of water through the ecosystem
- ◯ A diagram showing only producers and consumers
- ◯ **A complex network of interconnected food chains ✓**

> A food web is a complex network of interconnected food chains that illustrates how different organisms in an ecosystem are related through their feeding relationships. It shows the flow of energy and nutrients among various species, highlighting the interdependence of organisms.

Explain the difference between a food chain and a food web.

> **The main difference is that a food chain represents a single pathway of energy flow, whereas a food web illustrates multiple pathways and interactions among various organisms in an ecosystem.**

Which of the following organisms are considered consumers? (Select all that apply)

- [ ] Grass
- [ ] **Rabbit ✓**
- [ ] **Hawk ✓**
- [ ] **Deer ✓**

> Consumers are organisms that obtain their energy by feeding on other organisms, including plants and animals. Examples of consumers include herbivores, carnivores, and omnivores.

Which term describes the increase in toxin concentration as it moves up the food chain?

- ◯ **Biomagnification ✓**
- ◯ Decomposition
- ◯ Respiration
- ◯ Photosynthesis

> The term that describes the increase in toxin concentration as it moves up the food chain is called biomagnification. This process occurs because higher trophic levels consume multiple organisms, leading to a higher accumulation of toxins in their bodies.

What are the effects of biomagnification in food webs? (Select all that apply)

- [ ] **Increased toxin levels in top predators ✓**
- [ ] **Decreased biodiversity ✓**
- [ ] Enhanced growth of producers
- [ ] **Health risks to humans consuming affected species ✓**

> Biomagnification leads to increased concentrations of toxic substances in organisms at higher trophic levels, resulting in detrimental health effects on predators, including reproductive issues and increased mortality rates.

What are the potential consequences of removing a top predator from a food web?

The potential consequences of removing a top predator from a food web include increased populations of prey species, which can lead to habitat degradation and a decline in biodiversity.

Describe the role of a keystone species in maintaining ecosystem balance. Provide an example.

A keystone species is one that has a disproportionately large effect on its environment relative to its abundance, such as the sea otter, which maintains kelps by controlling sea urchin populations.

Which factors can disrupt a food web? (Select all that apply)

- [x] **Habitat destruction ✓**
- [ ] Stable climate conditions
- [x] **Pollution ✓**
- [x] **Overfishing ✓**

Food webs can be disrupted by various factors including environmental changes, introduction of invasive species, pollution, and overfishing. These disruptions can lead to imbalances in the ecosystem, affecting species populations and interactions.