

## Photo Description



A green gecko with blue coloring on its body sits on a dragonfly that has clear, detailed wings with intricate vein patterns. The dragonfly appears to be resting on green plant leaves, possibly near a water source. This image shows a predator-prey relationship between two different types of animals in their natural habitat.

## Scientific Phenomena

This image captures a predator-prey interaction as an anchoring phenomenon. The gecko is demonstrating carnivorous feeding behavior by capturing and consuming the dragonfly. This occurs because geckos are insectivores that rely on hunting other animals for their energy needs. The gecko's specialized adaptations (sticky toe pads, quick reflexes, and camouflage coloring) allow it to successfully capture flying insects like dragonflies. This represents energy transfer within a food web, where energy flows from one trophic level to another.

## Core Science Concepts

1. Food Webs and Energy Transfer: Energy flows from producers (plants) to primary consumers (insects that eat plants) to secondary consumers (geckos that eat insects).
2. Predator-Prey Relationships: Geckos have evolved hunting adaptations while dragonflies have developed escape mechanisms, creating a natural balance in ecosystems.
3. Animal Adaptations: Both animals show structural and behavioral adaptations - geckos have specialized toe pads and camouflage, while dragonflies have compound eyes and rapid flight abilities.
4. Habitat Requirements: Both animals depend on specific environmental conditions, with dragonflies needing water for reproduction and geckos requiring warm temperatures and shelter.

### Pedagogical Tip:

Use this image to help students practice making observations versus inferences. Have them list what they can directly see (gecko, dragonfly, green plants) versus what they think is happening (hunting, eating, hiding).

### UDL Suggestions:

Provide multiple ways for students to demonstrate their understanding of predator-prey relationships through drawing food webs, acting out animal behaviors, or creating digital presentations about adaptations.

## Zoom In / Zoom Out

1. Zoom In: At the cellular level, the gecko's digestive system breaks down the dragonfly's proteins into amino acids that can be absorbed and used for the gecko's growth and energy needs. Specialized enzymes in the gecko's stomach chemically break apart the complex molecules.
2. Zoom Out: This interaction is part of a larger wetland ecosystem where multiple food webs intersect. The health of this predator-prey relationship affects population dynamics throughout the ecosystem, influencing everything from plant pollination (fewer dragonflies) to insect pest control (well-fed geckos).

### Discussion Questions

1. What evidence can you observe that shows these two animals live in different parts of the food web? (Bloom's: Analyze | DOK: 2)
2. How might the gecko's hunting success affect other organisms in this ecosystem? (Bloom's: Evaluate | DOK: 3)
3. What adaptations help each animal survive in their shared habitat? (Bloom's: Apply | DOK: 2)
4. If dragonfly populations decreased in this area, what might happen to the gecko population and why? (Bloom's: Synthesize | DOK: 3)

### Potential Student Misconceptions

1. Misconception: "The gecko is being mean to the dragonfly."  
Clarification: Predation is a natural behavior necessary for survival, not a choice about being "mean" or "nice." Geckos must eat other animals to obtain the energy and nutrients they need to live.
2. Misconception: "All small animals eat plants."  
Clarification: Animals have different feeding strategies. Some eat plants (herbivores), some eat other animals (carnivores), and some eat both (omnivores) based on their body structures and energy needs.
3. Misconception: "Predators will eat all the prey animals."  
Clarification: Natural ecosystems maintain balance through population controls. When prey becomes scarce, predator populations decrease, allowing prey populations to recover.

### Cross-Curricular Ideas

1. Math - Data and Graphing: Students can research the hunting success rates of geckos and create bar graphs or pie charts showing what percentage of their diet comes from different insects (dragonflies, crickets, moths, etc.). They can practice collecting and organizing data about predator populations and prey availability.
2. ELA - Narrative Writing: Have students write a short story from the perspective of either the gecko or the dragonfly, describing the encounter and the adaptations each animal uses to survive. This builds descriptive writing skills while reinforcing scientific understanding of predator-prey interactions.
3. Art - Animal Illustration: Students can create detailed drawings or digital art of the gecko and dragonfly, focusing on accurately depicting their adaptations (the gecko's sticky toe pads, the dragonfly's intricate wing veins). They can research camouflage patterns and create their own habitat artwork showing how these animals blend into their environment.
4. Social Studies - Ecosystem Conservation: Students can explore how wetland habitats (where both geckos and dragonflies live) are being protected in their region or around the world. They can learn about conservation efforts and discuss why protecting predator-prey relationships is important for communities and biodiversity.

### STEM Career Connection

1. **Wildlife Biologist:** Wildlife biologists study animals like geckos and dragonflies in their natural habitats. They observe how animals interact with each other and their environment, collect data, and work to protect endangered species. Some wildlife biologists specialize in reptiles or insects and help preserve ecosystems. Average Salary: \$68,000/year
2. **Ecologist:** Ecologists study entire ecosystems and how all the organisms in them interact, including food webs and predator-prey relationships. They might work in wetlands, forests, or other habitats to understand how changes in one population affect all the others. Their work helps us manage natural areas responsibly. Average Salary: \$71,000/year
3. **Entomologist:** Entomologists are scientists who study insects, including dragonflies. They research insect behavior, how insects survive in different environments, and how insect populations change over time. Some entomologists work on protecting insects that are important to ecosystems. Average Salary: \$66,000/year

### NGSS Connections

- Performance Expectation: 5-LS2-1 - Develop a model to describe the movement of matter among plants, animals, decomposers, and the environment
- Disciplinary Core Ideas: 5-LS2.A - 5-LS2.B - 5-LS1.C
- Crosscutting Concepts: Systems and System Models - Energy and Matter

### Science Vocabulary

- \* **Predator:** An animal that hunts and eats other animals for food.
- \* **Prey:** An animal that is hunted and eaten by other animals.
- \* **Adaptation:** A special feature that helps an animal survive in its environment.
- \* **Food web:** A diagram showing how energy flows between different organisms in an ecosystem.
- \* **Carnivore:** An animal that eats only other animals for food.
- \* **Ecosystem:** All the living and non-living things in an area that interact with each other.

### External Resources

- Children's Books:
- Who Eats What? Food Chains and Food Webs by Patricia Lauber
  - Predator and Prey: A Look at Animals in Food Webs by Robin Koontz
  - What Is a Food Web? by Bobbie Kalman