Praying Mantis

Life Science | Lesson Guide

3rd Grade

Photo Description

This image shows a praying mantis, a green insect with long, thin legs and two large front arms held up like it's praying. The mantis is perched on plant stems near bright pink and yellow flowers. You can see its large eyes looking forward and its spiky arms ready to catch other insects.

Scientific Phenomena

Anchoring Phenomenon: Why does a praying mantis hold its front legs up in the air?

The praying mantis uses its distinctive front legs as hunting tools. This is an example of structural adaptation—a body part shaped by nature to help an animal survive. The mantis's folded front legs are actually powerful weapons. When an insect flies or crawls nearby, the mantis snaps these legs shut faster than we can blink to trap its food. The "praying" position is actually a waiting and hunting stance, not a religious gesture. This behavior has developed over millions of years because mantises with better hunting legs survived longer and had more babies.

Core Science Concepts

- Structural Adaptations: Animals have body parts that help them survive in their environment. The praying mantis's long, spiky legs are shaped perfectly for catching insects.

- Predator-Prey Relationships: A praying mantis is a predator (hunter) that eats other insects like flies and grasshoppers, which are its prey (food). This relationship helps keep insect populations balanced in nature.

- Camouflage: The mantis's green color blends in with leaves and flowers, helping it hide from larger predators while it waits to ambush its prey. This is called camouflage.

- Life Cycles: Praying mantises go through changes as they grow—from eggs to nymphs (young mantises) to adults. This is called incomplete metamorphosis.

Pedagogical Tip:

Third graders are naturally curious about "gross" and interesting facts. Emphasize that the praying mantis is a "super hunter" with special powers. This connection to predator-prey relationships and survival builds deeper understanding than facts alone. Consider showing a slow-motion video of a mantis striking—students are fascinated by the speed and precision!

UDL Suggestions:

Representation: Provide pictures and videos showing mantises in different poses (hunting, resting, eating). Some students may need simplified diagrams labeling body parts. Action/Expression: Allow students to act out the mantis hunt—some mime the mantis, others mime the prey. This kinesthetic approach helps tactile and kinesthetic learners understand predator behavior. Engagement: Connect to student interests: "This insect is like a ninja—super fast and sneaky!"

Zoom In / Zoom Out

Zoom In: The Mantis's Eyes (Microscopic Level)
When you look at a praying mantis up close, you see its two large eyes staring forward. But if we could zoom in even more—using a special microscope—we'd see thousands of tiny lenses inside each eye, all working together like a video camera! These tiny parts help the mantis see movement super fast, which is how it knows exactly when to snap its legs shut to catch an insect. Scientists call these tiny eye parts compound eyes, and they work differently than our human eyes. This is why mantises are such amazing hunters—their eyes and brain are specially designed to catch fast-moving prey.

Zoom Out: The Garden Ecosystem (System Level)
When we zoom out and look at the whole garden where this mantis lives, we see a connected web of life. The praying mantis sits in the middle of a food chain: plants !' insects (like flies) !' praying mantis !' birds. If we removed the mantis from this garden, the fly population would explode, and they might eat more plants or bother farmers. But if there were too many mantises, there wouldn't be enough insects to eat. The mantis helps keep nature in balance! The pink and yellow flowers in the photo are important too—they attract the insects the mantis hunts. Everything in a garden ecosystem is connected like a puzzle where each piece matters.

Discussion Questions

1. What do you think would happen if a praying mantis couldn't turn its head? How would that change its hunting? (Bloom's: Analyze | DOK: 2)

2. Why is the green color of the praying mantis helpful for catching insects? (Bloom's: Understand | DOK: 1)

3. If there were no praying mantises in a garden, what might happen to the number of flies and other insects? (Bloom's: Evaluate | DOK: 3)

4. How is a praying mantis similar to other hunters you know about, like a lion or an owl? (Bloom's: Analyze | DOK: 2)

Potential Student Misconceptions

Misconception 1: "Praying mantises are praying to God because of their position."
Clarification: The mantis isn't praying in a religious way. The name "praying" mantis comes from what it looks like, but the insect is actually in a hunting position. It holds its front legs up like it's ready to pounce on prey—similar to how a cat gets into a crouch before jumping on a toy. The mantis's "praying" pose is really a "ready to hunt" pose!

Misconception 2: "All insects are bad bugs that we should get rid of."
Clarification: Insects like praying mantises are important helpers in nature! The mantis eats insects that might damage gardens or crops. Some insects pollinate flowers so we can have fruit and vegetables. Even insects that seem "creepy" or "gross" have an important job in keeping nature healthy and balanced. We need insects!

Misconception 3: "The praying mantis is a vegetarian because it sits on plants."
Clarification: Just because the mantis lives on plants doesn't mean it eats them! The mantis is a carnivore, which means it eats only meat (other insects). It sits on plants because that's a great hiding spot to hunt. It's like a ninja hiding in the bushes, waiting for dinner to come by. The plant is just its hunting location, not its food.

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Extension Activities

Activity 1: Mantis Predator Simulation
Students play a game where one student is the "mantis" (blindfolded) sitting on a chair, and others are "insects" trying to walk past. When the teacher says "Go," the mantis points in the direction of a sound and tries to tag an insect. This builds understanding of how mantises hunt using sight and speed. Safety note: Use a safe, open space with clear boundaries.

Activity 2: Design a Perfect Hunter
Give students a piece of paper divided into sections: head, body, legs, and color. Ask them to draw an insect with adaptations that would make it a great hunter (sharp teeth, fast legs, dark color, etc.). Then compare their designs to actual predators. Discuss: "Did you include camouflage? Did you think about speed?"

Activity 3: Food Web Construction
Create a classroom food web with mantis, flies, grasshoppers, plants, and birds. Use yarn to connect who eats whom. Discuss: "What would happen if all the mantises disappeared?" This builds systems thinking and understanding of interdependence.

Cross-Curricular Ideas

ELA Connection: Narrative Writing
Have students write a short story from the perspective of a fly buzzing around flowers. "One Day as a Fly" could describe the fly's adventure visiting flowers until it encounters the praying mantis. This combines creative writing with understanding predator-prey relationships. Students can draw pictures to accompany their stories, making it a picture book project.

Math Connection: Speed and Measurement
Introduce the idea that a praying mantis strikes in about 1/10th of a second—faster than students can blink! Create a measurement activity: "If a mantis can catch an insect in 1/10 of a second, how many insects could it catch in 1 second? In 10 seconds?" Use concrete blocks or drawings to show the passage of time and practice multiplication concepts (3-OA standard). Create a chart showing "Mantis Hunting Speed" vs. "Human Reaction Time."

Art Connection: Camouflage Design
Students design their own insect using art supplies (colored paper, markers, collage materials) with camouflage adaptations for different environments. One student might create a mantis-like insect for a green garden, another for a rocky area, and another for a desert. Display them on corresponding background scenes. Discuss which insects are hardest to spot and why. This combines art, design thinking, and understanding of adaptation.

Social Studies Connection: Insect Habitats Around the World
Research where praying mantises live naturally (tropical and warm regions). Using a world map, locate countries where mantises are found. Compare the climate and plants in these regions to your local area. Discuss: "Why do you think mantises live in warm places? What would happen if we brought a mantis to live somewhere very cold?" This builds geography skills and understanding of environmental adaptation.

STEM Career Connection

Entomologist (Insect Scientist)
An entomologist is a scientist who studies insects like praying mantises! They observe how insects behave, what they eat, and how they help or hurt our gardens and crops. Some entomologists work for farms to help farmers protect their plants, while others work in museums or universities teaching people about insects. They might watch a mantis for hours with cameras and notebooks to learn its secrets. Average Salary: $63,000–$75,000 per year

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Wildlife Photographer
A wildlife photographer takes beautiful pictures and videos of animals like praying mantises in their natural habitats. They use special cameras and lenses to capture amazing moments—like a mantis catching its lunch! These photos go in magazines, books, nature documentaries, and on websites to teach people about animals. It's like being a nature detective with a camera! The photo in your lesson was taken by a wildlife photographer. Average Salary: $50,000–$70,000 per year (varies greatly by experience and client base)

Pest Control Specialist or Agricultural Scientist
These professionals help farmers and gardeners protect their plants from harmful insects. They study which insects are good helpers (like mantises that eat bad bugs) and which ones cause problems. They might use praying mantises as a natural solution instead of chemicals! They work outdoors and in laboratories to figure out the best ways to keep gardens and farms healthy. Average Salary: $56,000–$72,000 per year

NGSS Connections

Performance Expectation:
3-LS4-2: Use evidence to construct an explanation that some animals form groups that help members survive.

Disciplinary Core Ideas:
- 3-LS1.B — Information Processing (The mantis uses its large eyes to see and locate prey)
- 3-LS2.C — Organism Interactions; Energy, and Dynamics (Predator-prey relationships and food webs)
- 3-LS4.B — Variation of Traits (The mantis's unique leg structure is a trait that helps it survive)

Crosscutting Concepts:
- Structure and Function — The mantis's body parts are designed for specific purposes
- Patterns — The mantis's hunting behavior follows predictable patterns based on its adaptations
- Cause and Effect — The mantis's green color causes it to blend in with plants (effect), which helps it hunt successfully

Science Vocabulary

* Predator: An animal that hunts and eats other animals for food.

* Prey: An animal that is hunted and eaten by another animal.

* Adaptation: A body part or behavior that helps an animal survive in its environment.

* Camouflage: Colors or patterns on an animal's body that help it hide by blending in with its surroundings.

* Nymph: A young insect that looks similar to the adult version but is smaller and doesn't have wings yet.

External Resources

Children's Books:
- Praying Mantis: The Garden's Fierce Hunter by Meish Goldish (National Geographic Kids)
- Insects by DK Findout (Simple, photo-rich explanations appropriate for Grade 3)
- Are You a Butterfly? by Judy Allen (Helps explain incomplete metamorphosis)

- Title: "National Geographic Kids: Praying Mantis Facts"
  Description: Short (3-5 minute) educational video with clear narration, colorful visuals, and facts about mantis behavior and adaptations.
  URL: https://www.natgeokids.com/en_GB/discover/animals/insects/praying-mantis/ (Reputable source with video content)

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Teacher Note: This lesson bridges curiosity about "creepy-crawlies" with rigorous science standards around adaptation and ecosystems. The praying mantis is an excellent anchor phenomenon because it's visually striking, easy to observe in nature, and connects multiple NGSS concepts at the Grade 3 level.

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