

## Photo Description



This image shows a large group of snow geese resting in a plowed farm field during their migration. You can see hundreds of white birds scattered across the brown soil, with a few birds flying overhead. Power lines and distant trees line the horizon, showing this is an agricultural area where migrating birds stop to rest and find food.

## Scientific Phenomena

Anchoring Phenomenon: Long-distance bird migration and stopover site selection

This image captures an important part of the annual migration cycle of snow geese. Snow geese travel thousands of miles between their Arctic breeding grounds and wintering grounds in the southern United States and Mexico. They stop at places like farm fields to rest and refuel with food (seeds and plants) before continuing their journey. This behavior is triggered by seasonal changes in daylight length and temperature, which signal to the birds that it's time to move to a location with better food and weather conditions. The geese instinctively know which routes to take and where to stop—knowledge passed down through generations.

## Core Science Concepts

1. Migration as an Adaptation: Snow geese have evolved the ability to migrate long distances to survive harsh winters and find abundant food sources. This is a behavioral adaptation that helps the species survive.
2. Seasonal Environmental Changes: Birds respond to seasonal patterns—shorter days and colder temperatures in fall trigger southward migration, while longer days and warming temperatures in spring trigger northward migration.
3. Habitat Selection and Resource Needs: Geese choose stopover sites strategically based on the availability of food, water, and safe resting areas. Farm fields provide seeds and vegetation, making them ideal rest stops.
4. Population Dynamics and Interdependence: Large flocks of geese depend on each other for safety (more eyes watching for danger) and information-sharing about good feeding and resting locations.

### Pedagogical Tip:

Use this image as a "hook" at the beginning of the unit. Ask students to notice details first (descriptive observations) before explaining the "why" (scientific explanations). This scaffolds comprehension and maintains student engagement. Consider using a document camera to zoom in on different parts of the photo during whole-group discussion.

### UDL Suggestions:

Provide Multiple Means of Representation: Some students may benefit from a simplified diagram showing the migration route (north! south) with seasonal labels. Others might benefit from a video showing geese in motion. Offer both visual and kinesthetic options (e.g., have students act out migration movements).

Provide Multiple Means of Engagement: Connect migration to students' own experiences (Have you ever traveled far from home? How did you prepare?). This personal relevance increases motivation and deepens understanding.

## Discussion Questions

1. Why do you think the snow geese stopped in this farm field instead of flying all the way south without stopping? (Bloom's: Analyze | DOK: 2)
2. What would happen to the geese if they didn't migrate during winter? (Bloom's: Evaluate | DOK: 3)
3. How do you think the geese know when it's time to fly south and which direction to go? (Bloom's: Infer | DOK: 2)
4. Compare and contrast how snow geese prepare for migration with how you prepare for a long car trip. (Bloom's: Compare | DOK: 3)

## Extension Activities

1. Migration Route Mapping: Provide students with a map of North America. Using string or yarn, have them trace the migration route of snow geese from the Arctic to Mexico. Mark stopover sites like the one in the photo. Students can label the seasons and explain why geese stop at each location.
2. Energy Demands Investigation: Discuss how much energy migration requires. Have students calculate (or estimate) how far the geese fly and how much food they need. Create a simple chart showing what geese eat (seeds, plants) and estimate how long food in one farm field would last for 100 geese.
3. Bird Behavior Observation: If possible, take students outside to observe local birds (crows, sparrows, robins, etc.). Ask: Do these birds migrate? How do they find food? How do they stay safe? Create a class comparison chart between local birds and snow geese.

## NGSS Connections

Performance Expectation: 4-LS1-1: Use evidence to construct an explanation for how the structures of animals help them function in their environment.

Disciplinary Core Ideas:

- 4-LS1.A Structure and Function
- 4-LS1.D Information Processing (How animals sense their environment)

Crosscutting Concepts:

- Patterns (Seasonal patterns trigger migration behavior)
- Cause and Effect (Environmental changes cause migration)
- Systems and System Models (Geese are part of agricultural and wetland ecosystems)

## Science Vocabulary

- \* Migration: The long journey that animals make seasonally from one place to another to find food, water, or better weather.
- \* Adaptation: A body part or behavior that helps an animal survive in its environment.
- \* Stopover: A place where traveling animals rest and refuel before continuing their journey.
- \* Instinct: A natural behavior that an animal is born knowing how to do, without having to learn it.
- \* Seasonal: Related to the four seasons (spring, summer, fall, winter) and the patterns that repeat each year.

## External Resources

### Children's Books:

- Stranger in the Woods by Carl R. Sams II and Jean Stoick (photo-illustrated story about geese migration)
- Swirl by Swirl: Spirals in Nature by Joyce Sidman (includes migration patterns and nature spirals)
- Are You a Butterfly? by Judy Allen (metamorphosis and seasonal change themes; good for understanding animal life cycles)

### YouTube Videos:

- "Snow Goose Migration" by National Geographic Kids (2:15) — Shows stunning aerial footage of migrating geese flocks and explains why they migrate. <https://www.youtube.com/watch?v=rK5hJJYHbLc>
- "How Do Birds Know Which Way to Migrate?" by TED-Ed (4:50) — Animated explanation of how geese navigate using magnetic fields, sun position, and landmarks. <https://www.youtube.com/watch?v=WD2Vdm0FJYA>

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Teaching Tip: This lesson naturally connects to units on ecosystems, animal adaptations, and seasonal change. Consider pairing it with studies of wetlands or agricultural systems where geese are found.