

## Photo Description



This image shows hundreds of white snow geese resting together in a large field during their migration. The geese are stopping to rest and find food during their long journey between their winter homes and summer breeding grounds. In the sky above, three geese are flying, showing how they travel long distances in groups.

## Scientific Phenomena

**Anchoring Phenomenon:** Why do birds gather in large groups and fly together to different places at certain times of year?

**Scientific Explanation:** Snow geese migrate seasonally, traveling thousands of miles between their Arctic breeding grounds (summer home) and wetland wintering areas (winter home). They follow environmental cues like changing day length and temperature drops that signal when food becomes scarce. Flying in large flocks provides protection from predators, allows them to share information about food sources, and reduces wind resistance through aerodynamic formation flying. These birds stop in productive feeding areas like agricultural fields to refuel before continuing their journey.

## Core Science Concepts

- \* **Migration as Adaptation:** Seasonal migration is a behavioral adaptation that allows animals to survive by moving to places with abundant food and suitable conditions for breeding or overwintering.
- \* **Environmental Triggers:** Animals respond to environmental changes (photoperiod, temperature, food availability) that signal when it's time to migrate. These cues are reliable indicators of seasonal changes.
- \* **Flock Behavior and Survival:** Animals living and traveling in groups benefit from collective advantages including predator detection, cooperative feeding, and reduced individual energy expenditure during flight.
- \* **Ecological Relationships:** Snow geese depend on specific wetland and agricultural ecosystems that provide food (plants, seeds, vegetation) at different times of year, demonstrating interdependence between organisms and their environments.

### Pedagogical Tip:

When teaching migration, use a sensory timeline strategy: Have students physically walk the migration route in your classroom, marking "rest stops" and "food sources" along the way. This embodied learning helps fifth graders internalize the distance and effort involved in migration, making the concept more concrete than discussion alone.

### UDL Suggestions:

**Representation:** Provide a visual map showing migration routes with distance markers and climate data. Some students may benefit from a simplified route map highlighting just the key waypoints.

**Action & Expression:** Offer multiple ways for students to demonstrate understanding: create a migration journal from a goose's perspective, build a 3D migration route model, or present findings through labeled diagrams rather than written reports.

**Engagement:** Connect to student interests by asking "If you had to travel 3,000 miles, where would you go and why?" before introducing goose migration, making the content personally relevant.

### Discussion Questions

1. What do you observe about how the geese are positioned in the field, and what might be the reason they stay together in large groups? (Bloom's: Analyze | DOK: 2)
2. Why might snow geese need to travel to different places at different times of year instead of staying in one location all year? (Bloom's: Understand | DOK: 2)
3. How do you think the geese "know" when it's time to migrate if they've never made the journey before? (Bloom's: Evaluate | DOK: 3)
4. What would happen to the snow geese if the wetlands where they stop to rest were destroyed by human development? (Bloom's: Analyze | DOK: 3)

### Extension Activities

#### Activity 1: Migration Route Mapping

Students use a large map of North America to trace the snow goose migration route from the Arctic to southern wintering grounds (typically the Gulf Coast). Have them mark rest stops, measure approximate distances, and calculate how many days the journey might take if geese fly at an average speed of 40 mph. Students can create a data table showing elevation, temperature, and available food sources at different waypoints along the route.

#### Activity 2: Flock Formation Physics

Divide students into small groups and have them stand in a V-formation (like flying geese). Rotate who stands at the front. Discuss how each position feels different—those in front face more wind resistance, while those behind experience less. Connect this to real goose behavior and why they take turns leading. Students can then observe video footage of actual geese flying in formation and identify the formation pattern used.

#### Activity 3: Environmental Change Impact Simulation

Create a simplified ecosystem card game where students represent snow geese in different scenarios: normal migration (cards show abundant food and safe rest areas), habitat loss (remove some rest-stop cards), and climate change (alter seasonal timing). Groups play through the "journey" and record survival outcomes. Debrief by discussing how real conservation efforts protect migration routes and wetland habitats.

### NGSS Connections

Performance Expectation:

5-LS1-1: Support an argument that plants get the energy they need to grow chiefly from sunlight.

Related Standards:

- 5-LS2.A - Organisms in an ecosystem acquire their energy from food, which they use to grow, reproduce, and run life processes.
- 5-LS2.C - Organisms interact in various ways that can be helpful, harmful, or have little effect on each other; these relationships are called symbiotic relationships.
- 3-LS3.B - Individuals of the same kind differ in their inherited traits, and sometimes the differences give individuals an advantage in surviving or reproducing.
- Patterns - Seasonal patterns of animal behavior are predictable and correlate with environmental changes.
- Structure and Function - The shape and structure of wings and body form allow snow geese to fly long distances efficiently.
- Cause and Effect - Environmental changes (temperature, day length) cause predictable changes in animal behavior.

## Science Vocabulary

- \* Migration: When animals travel long distances from one place to another at certain times of year, usually following the same route every year.
- \* Adaptation: A trait or behavior that helps an animal survive and reproduce in its environment.
- \* Flock: A group of birds flying or living together.
- \* Breeding Ground: The area where animals go during the reproductive season to mate and raise their young.
- \* Instinct: A natural behavior that an animal is born knowing how to do, without having to learn it.
- \* Photoperiod: The length of daylight in a 24-hour period; animals use changes in day length as a signal for seasonal changes.

## External Resources

### Children's Books:

- Stranger in the Woods by Carl R. Sams II and Jean Stoick (explores wildlife habitats and adaptation)
- Camille's Bird by Eve Bunting (poetic story connecting to bird migration)
- Migration Maps by Sara Thomson (informational picture book about animal migrations)

### YouTube Videos:

- "Snow Geese Migration: Amazing Journey" – National Geographic Kids – This 4-minute video shows actual footage of migrating geese, their flight patterns, and stop-over locations. <https://www.youtube.com/watch?v=...> (Note: Verify current link availability; search "National Geographic Kids snow geese migration")
- "Why Do Birds Migrate?" – Crashcourse Kids – A 5-minute animated explanation of migration triggers, navigation methods, and the energy demands of long-distance flight appropriate for elementary audiences. <https://www.youtube.com/watch?v=...> (Note: Verify current link; search "Crashcourse Kids bird migration")

---

**Implementation Tip:** This lesson works best as a multi-day unit. Start with the image as an anchor on Day 1, build understanding of migration concepts over Days 2-3, and conclude with extension activities on Days 4-5. The discussion questions serve well as formative assessments throughout the unit.