

The Chimney Swift Lifestyle



STANDARD COURSE OF STUDY CORRELATIONS:

Social Studies, Grade 6, Goal 1: The learner will use the five themes of geography and geographic tools to answer geographic questions and analyze geographic concepts.

1.01 Create maps, charts, graphs, databases, and models as tools to illustrate information about different people, places and regions in South America and Europe.

1.02 Generate, interpret, and manipulate information from tools such as maps, globes, charts, graphs, databases, and models to pose and answer questions about space and place, environment and society, and spatial dynamics and connections.

1.03 Use tools such as maps, globes, graphs, charts, databases, models, and artifacts to compare data on different countries of South America and Europe and to identify patterns as well as similarities and differences among them.

Social Studies, Grade 6, Goal 2: The learner will assess the relationship between physical environment and cultural characteristics of selected societies and regions of South America and Europe.

2.01 Identify key physical characteristics such as landforms, water forms, and climate, and evaluate their influence on the development of cultures in selected South American and European regions.

2.02 Describe factors that influence changes in distribution patterns of population, resources, and climate in selected regions of South America and Europe and evaluate their impact on the environment.

2.03 Examine factors such as climate change, location of resources, and environmental challenges that influence human migration and assess their significance in the development of selected cultures in South America and Europe.

Social Studies, Grade 6, Goal 3: The learner will analyze the impact of interactions between humans and their physical environments in South America and Europe.

3.01 Identify ways in which people of selected areas in South America and Europe have used, altered, and adapted to their environments in order to meet their needs, and evaluate the impact of their actions on the development of cultures and regions.

3.02 Describe the environmental impact of regional activities such as deforestation, urbanization, and industrialization and evaluate their significance to the global community.

3.03 Examine the development and use of tools and technologies and assess their influence on the human ability to use, modify, or adapt to their environment.

3.04 Describe how physical processes such as erosion, earthquakes, and volcanoes have resulted in physical patterns on the earth's surface and analyze their effects on human activities.

Social Studies, Grade 6, Goal 4: The learner will identify significant patterns in the movement of people, goods and ideas over time and place in South America and Europe.

4.01 Describe the patterns of and motives for the migrations of people, and evaluate their impact on the political, economic, and social development of selected societies and regions.

4.02 Identify the main commodities of trade over time in selected areas of South America and Europe, and evaluate their significance for the economic, political and social development of cultures and regions.

MATERIALS

- ◆ Assortment of used travel postcards
- ◆ Bird field guides
- ◆ Laminated maps of the world (or at least of North America and South America)
- ◆ Dry erase markers
- ◆ Colored pencils
- ◆ Length of string for measuring distances on map
- ◆ Quick-drying glue
- ◆ Twigs
- ◆ Cardboard boxes/shoebboxes, one per team
- ◆ Photos of chimney swifts that show beaks, wings, feet and tails
- ◆ Photos of swift nests (or a real swift nest)
- ◆ DVD player (a laptop computer will do) to show video clips of swifts roosting
- ◆ Viewing Guides, one per student

PREPARATION

- ◆ Collect (or have students bring in) several used travel postcards. Students will be sharing and reading these in the *Engage* exercise.
- ◆ Make copies of worksheets.
- ◆ Set up four "Swift Stations" devoted to each of these topics:
Migration Stock this station with field guides, maps, dry erase markers, string and worksheet.
Nesting Stock this station with photos of swift nests*, small twigs (1-3 inches), glue, cardboard boxes and worksheet.
Adaptations Stock this station with several chimney swift photos, colored pencils and worksheet.
Roosting Stock this station with a DVD player set up to show video clips of roosting swifts congregating at chimneys (www.youtube.com/watch?v=m7b8PpiNhJg). Also include worksheet.

*You might contact a local chimney sweep to find a nest to display. To use a nest in your classroom, you must obtain a permit from the N.C. Wildlife Resources Commission. Write to the commission on school letterhead to request a salvage permit. The current contact is: Daron K. Barnes, Permits Supervisor, Division of Wildlife Management, N.C. Wildlife Resources Commission, 1722 Mail Service Center, Raleigh, NC 27699-1722, daron.barnes@ncwildlife.org, (919) 707-0060.

4.03 Examine key ethical ideas and values deriving from religious, artistic, political, economic, and educational traditions, as well as their diffusion over time, and assess their influence on the development of selected societies and regions in South America and Europe.

Science, Grade 6, Goal 7: The learner will conduct investigations and use technologies and information systems to build an understanding of population dynamics.

7.03 Explain how changes in habitat may affect organisms.

INTRODUCTION TO LESSON: Students will explore the migration, nesting, adaptations and roosting of chimney swifts by visiting several classroom stations in teams to explore chimney swift behavior. They will also create postcards in which swifts describe their experiences in North Carolina and Peru.

BACKGROUND FOR TEACHER: The chimney swift (*Chaetura pelagica*) is one of four swift species found in the United States and is the only one east of the Rocky Mountains. Swifts are classified in the family Apodidae (which means “without feet”) and are closely related to hummingbirds. In pre-Colonial times, these birds nested in the cavities of large, hollow trees. Following European settlement of North America and the logging of Eastern forests, swifts became dependent upon artificial structures such as chimneys.

Often described as “flying cigars,” chimney swifts have short, dark-gray, cigar-shaped bodies, long, narrow wings and a short, bristle-tipped tail. Their short, weak legs and feet are suitable only for clinging upright to vertical surfaces—if a swift were to land on the ground, it is likely that it would not be able to take off again. Chimney swifts fly constantly during the day—about 14 hours—hunting insects and even mating and collecting nest material in flight. Swifts nest in chimneys. No matter the size of the chimney, there will generally be only one active nest at a time. In late summer, swifts roost in large, old chimneys by the thousands. They can be seen circling chimneys before diving in for the night. Swifts are migratory, spending summers in North America before leaving for South America. Swifts are often confused with bats because of their similar size and darting flight behavior.

engage > Hand out postcards to groups of students and have them discuss what the postcard reveals about the place of origin and activities of the sender. Tell students that they will be learning about the chimney swift, a bird that travels great distances. Ask them to think about the kinds of postcards a migratory bird might send.

explore > Divide the class into teams and have them circulate among the stations, completing one team worksheet.

explain > Show the video and have students answer Viewing Guide questions.

elaborate > Have each student create a set of four “postcards from a swift.” The location of origin may be either of their habitats (North Carolina or Peru). The front of each postcard should illustrate the habitat. The notes on the postcards should represent at least one topic from the Swift Stations (migration, nesting, adaptations, roosting). Students may present their finished postcards or display them on a bulletin board.

evaluate > Use the student postcards to measure learning. Use the rubric to help you assess.



BEYOND THE CLASSROOM

- Find out if your school has a chimney swift roost site or locate a site nearby. Visit the site with students in September to watch chimney swifts enter the roost at dusk. Have students reflect on the experience and share with the class.
- Visit <http://www.chimney-swifts.org/page12.html> to learn more about chimney swifts and find instructions for building a swift tower on your school grounds.

Additional Resources:

Driftwood Wildlife Association's Chimney Swift Project • <http://www.chimneyswifts.org/>

Chimney Swifts: America's Mysterious Birds Above the Fireplace. Kyle, Paul D. and Georgean Z. Kyle. 2005. Texas A&M University Press.

Chimney Swifts: New Habitat for America's Mysterious Birds. Kyle, Paul D. and Georgean Z. Kyle. 2005. Texas A&M University Press.



RUBRIC

Score of 1-5, 5 being best.

Postcard/learning goal	Migration	Nesting	Adaptations	Roosting
Presentation of facts				
Illustration on card				
Use of vocabulary				

Teacher's Notes:

MIGRATION STATION

1. Use the dry erase markers to identify North Carolina and Peru on the map. Use the string to figure out the distance the swifts fly between North Carolina and Peru. *Answers will vary, depending on whether students calculate the shortest distance or trace the swifts' path over land only. The distance between RDU and Lima, Peru, is about 3,295 air miles.*
2. If a swift has an average flying speed of 50 mph and flies non-stop from 7 a.m. until 7 p.m., how many miles would it travel in a day? *140.* How many miles would it travel in a week? *980.*
3. Use your distance estimates to calculate how many days it would take a swift to fly from North Carolina to Peru. *Answers will vary, depending on answer to Question 2.*
4. What factors other than distance might influence how quickly the swifts can reach Peru? *Storms, favorable winds, whether birds travel over land or sea.*

NESTING STATION

1. Carefully examine the chimney swift nest. What do you notice? *Answers might include: small twigs, clear/gray substance, cup shape, attached to side of chimney.*
2. Use the twigs and glue to construct a nest inside the box. What was challenging? What was successful? What is different about your cardboard box and a real nesting site? *Challenges might include: difficulty in attaching twigs/nest to side of box; glue not drying; glue sticking to fingers. Successful techniques might include: allowing the glue to dry at intervals (Remember: swifts rely on multiple outings to collect twigs, so the saliva in their nest-in-progress has time to dry between trips) and sorting the twigs by size, then working with some of the smaller pieces first. (Remember: swifts can't carry twigs that are too big). Walls of chimneys and trees are rough and probably easier to attach a nest to than a cardboard box.*
3. What might be some advantages of nesting inside chimneys or hollow trees, rather than out on a limb, for example? *Answers might include: protection from wind and rain, protection from many types of predators and insects, more stable temperatures.*

ADAPTATIONS STATION

1. Use the space below to sketch the chimney swift. Pay special attention to the wings, beak and tail. *Sketches should show the short, curved wings, the small, sharp beak and the stiff bristles in the tail.*
2. Each of these features is important for the survival of the swift. Explain how each functions:
Wings: *Designed for quick flight needed to catch flying insects.*
Beak: *Small, sharp beak for snatching insects out of the air.*
Tail: *Stiff feathers and bristles allow swifts to perch against the interior of hollow trees and chimneys.*

ROOSTING STATION

1. Watch the video clips of swifts flying around and into the chimney. Propose an explanation for the behavior you see. *Answers might include: swifts roost closely together to share body warmth at night; gather to fly together like the way that fish school to avoid predators.*
2. Researchers have a difficult task estimating the number of swifts at a roost. How might you count the birds at a roost site? *Answers might include: taking a photo or time-lapse image and counting; counting the number of swifts sighted within a specific length of time (such as 1 minute) and then multiplying by how many minutes lapse while the swifts drop into the chimney during the evening; placing cameras in chimneys and counting as birds as they land.*
3. The chimney swift population increased dramatically after the European settlers arrived, as opposed to most species, whose numbers decreased due to diminished habitat. Why do you think the swift numbers stayed strong? *Settlers logged many forests, which decreased habitat for swifts, but the people also built homes with chimneys, inadvertently providing alternative breeding and roosting habitat.*
4. In the past 30 years, chimney swift population has begun declining in number, decreasing by 3 percent per year. What do you think is going on? What can humans do to help chimney swifts? *Many chimneys are now capped or lined with metal, and chimney swifts cannot nest or roost in them. Swifts have adapted to breed and roost in chimneys and now are almost exclusively dependent on them. Humans can help by removing caps from chimneys and leaving hollow trees where they stand. People can also build artificial towers for chimney swift nesting and roosting (see www.chimneyswifts.org).*

Names of Team Members:

Chimney Swifts Migration Station Worksheet



In late March, swifts begin arriving in North Carolina from their wintering grounds in the Amazon forests of Peru. Incredibly, the location where swifts spent the winter was unknown for hundreds of years. In the late 1930s and early 1940s, researchers banded more than 375,000 swifts to try to discover where they went in winter. Indians from the Amazon River region retrieved 13 bands in 1944. The bands were brought to the American Embassy in Peru, and scientists were able to track down the swifts' winter home. Young people were key to solving this mystery—five of the 13 recovered bands came from birds banded by Boy Scout volunteers from Memphis, Tenn.

1. Use the dry erase markers to identify North Carolina and Peru on the map. Now use the string to figure out the distance the swifts fly between North Carolina and Peru.

2. If a swift has an average flying speed of 50 mph and flies non-stop from 7 a.m. until 7 p.m., how many miles would it travel in a day?

How many miles would it travel in a week?

3. Use your distance estimates to calculate how many days it would take a swift to fly from North Carolina to Peru.

4. What factors other than distance might influence how quickly the swifts can reach Peru?

Names of Team Members:

Chimney Swifts

Nesting Station Worksheet



During the nesting season (May-July), chimney swifts use their glue-like saliva to attach twigs to the inside of a chimney or tree hollow, creating a semicircular nest. Swifts lay 3-5 eggs, and both parents help with incubation. The newly hatched young are pink, lacking any feathers. By the second week, the nestlings beg loudly—three hungry babies can sound like a dozen. By the 30th day, the young will fledge and take their first flight.

1. Carefully examine the chimney swift nest. What do you notice?
2. Use the twigs and glue to construct a nest inside the box. What was challenging? What was successful? What are the differences between your box and a real nesting structure?
3. What might be some advantages of nesting inside chimneys or hollow trees, rather than out on a limb, for example?

Names of Team Members:

Chimney Swifts

Adaptation Station Worksheet



Like other birds, chimney swifts have specialized physical features that help them survive as a species. An owl, for example, has big eyes to capture as much available light as possible while it hunts at night. A vulture has broad wings that allow it to glide through the air, expending little energy as it searches for carrion. The chimney swift's beak, tail and wings have evolved to provide the most efficient design for its lifestyle.

1. Use the space below to sketch the chimney swift. Pay special attention to the wings, beak and tail.

2. Each of these features is important for the survival of the swift. Explain how each functions:

Wings:

Beak:

Tail:

Names of Team Members:

Chimney Swifts

Roosting Station Worksheet



One of the most exciting chimney swift behaviors to observe is their roosting during fall migration. About an hour before sunset, hundreds and sometimes thousands of birds congregate in the air above large chimneys (such as those found at many elementary and middle schools, which are more likely to be in older buildings). The birds swarm, circle and swoop in the immediate vicinity of the chimney for up to an hour. Suddenly, they dive into the opening. Inside, the swifts cling to the walls of the chimney with their feet, using their bristled tail feathers for support. To share such a small space, the birds must layer their bodies tightly, in much the manner that shingles overlap on a roof. The nightly roosting phenomenon can be observed almost every evening throughout August and September. By October, most of the birds have departed for their South American wintering grounds.

1. Watch the video clips of swifts flying around and into the chimney. Propose an explanation for the behavior you see.

2. Researchers have a difficult task estimating the number of swifts at a roost. How might you count the birds at a roost site?

3. The chimney swift population increased dramatically after European settlers arrived, as opposed to most species, whose numbers decreased due to diminished habitat. Why do you think the swift population stayed strong?

4. In the past 30 years, chimney swift populations have begun declining in number, decreasing by an average of 3 percent per year. What do you think is going on? What can humans do to help chimney swifts?