



birds

★ *teacher's guide*

University of Nebraska State Museum

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Dear Colleague,

The Birds Encounter Kit has been developed to bring hands-on materials from the University of Nebraska State Museum (UNSM) as well as inquiry-based activities related to birds to your classroom. Students have a great interest in birds and this kit will support and develop that interest. The kit is organized in five topic areas which contain ten activities.

1. **Bird Identification**
 - *Birdfeeder* Outdoor Biology Instructional Strategies (OBIS) Activity
 - *Using a Field Guide* University of Nebraska State Museum (UNSM) Activity
2. **Bird Behavior**
 - *Jay Play* OBIS Activity
 - *For the Birds* OBIS Activity
 - *Bird Sounds* UNSM Activity
3. **Bird Nests**
 - *Bird Nests* OBIS Activity
4. **Bird Migration**
 - *Migration Path* UNSM Activity
5. **Bird Adaptations**
 - *Flappers* National Wildlife Federation (NWF) Activity
 - *Fill the Bill* NWF Activity
 - *Feet are Neat* NWF Activity

The activities are designed for upper elementary and middle school students but may be adapted for other ages. Each activity will take **40 to 60 minutes** of class time and may be presented in two or more sessions. Any group size is possible, but **groups of less than 30 students are recommended**. Some of the activities must be done outdoors, but most can be done indoors or outdoors depending on the weather and your classroom design. Complete descriptions of each activity and a summary of how each activity supports the Nebraska Educational Standards are in the Teacher's Guide.

In addition to the activities, this kit contains many specimens and additional materials that may be used in a variety of ways in the classroom. Please use this material to complement and enrich your own bird-related curriculum, and share your ideas with us. Your input into the usefulness, effectiveness and enjoyment of this kit is valuable. You may assist the University of Nebraska State Museum in developing and improving our encounter kits by completing the enclosed [Evaluation Form](#). Your opinion is most important!

We hope that you and your students enjoy learning about the rich diversity of birds in Nebraska. If you have any questions, feel free to call us at (402) 472-6302.

The University of Nebraska State Museum Education Staff

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Part 2 - Using a Field Guide Learning Objective: Students observe bird size, shape, characteristics and field marks. Students draw and record observations, using field guides to identify birds.

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Part 1 - Jay Play Learning Objective: Students observe and record bird food color preference behavior.

Part 2 - For the Birds Learning Objective: Students provide a feeding station to observe and identify eating behaviors.

Part 3 - Bird Sounds Learning Objective: Students identify birds by their sounds and create their own methods of representing birdcalls and songs.

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Part 2 - In a Nest Learning Objective: Students examine nests and record observations about the type of bird using the nests and the environments in which they could be found.

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Part 2 - Fill the Bill Learning Objective: Students will use tools to demonstrate the adaptations of bird beaks.

Part 3 - Feet are Neat Learning Objective: Students create bird feet and explain why their adaptations allow for survival.

Nebraska Science Standards p. 17

Encounter Kits

Encounter Kits are organized around a teaching-learning framework, which guides teaching and learning through four main stages.

STARTING OUT:

Usually a full group discussion. This provides an opportunity for you to stimulate curiosity, set challenges, and raise questions. Students share their knowledge and previous experience on the topic.

Teacher: _____

- Probes for current knowledge and understanding
- Motivates and stimulates activity
- Sets challenges and poses problems

Student: _____

- Shares thoughts and ideas
- Raises questions

ACTIONS:

Groups of students look closely at the phenomena or actively participate in actual scientific work. They work directly with materials. It is important to allow enough time for this inquiry stage, so that they can explore materials and concepts that are new and fully experience trial and error. This can be an investigation time as students discuss ideas together, try out activities and manipulate materials.

Teacher: _____

- Facilitates
- Observes

Student: _____

- Explores
- Observes
- Works as a team member
- Problem solves
- Records

TYING IT ALL TOGETHER:

Usually a full group experience, this stage provides students with the opportunity to share their discoveries and experiences. You guide them as they clarify and organize their thinking, compare their different solutions, analyze and interpret results, and attempt to explain the phenomena they have experienced.

Teacher: _____

- Questions
- Guides
- Assesses student understanding

Student: _____

- Interprets and analyzes
- Synthesizes
- Communicates
- Questions

BRANCHING OUT:

This optional stage allows the students to connect and relate learning from the kit activity into other projects and activities.

Teacher: _____

- Facilitates
- Assesses understanding

Student: _____

- Applies
- Questions
- Integrates

Contents of the Birds Kit

Activity 1: Bird Identification

In Teacher's Guide:

- *Birdfeeder* OBIS Activity
- *Using a Field Guide* UNSM Activity

In Packet:

- National Audubon Society *First Field Guide Birds*
- 10 *Waterfowl Identification in the Central Flyway*
- National Geographic Society *Field Guide to the Birds of North America*
- 3 *Golden Guide Birds*
- 3 *Peterson First Guide to Birds of North America*
- *Who's Who in Great Plains Songbirds*
- UNSM Museum Notes #95 *Windows of Death: A Look at Bird Strikes*

Additional Materials:

- 15 *How Birds Get a Living* reference sheet (see Bird Adaptations)
- *America's Bald Eagle* poster
- *Endangered Means There is Still Time* poster
- 2 *Help Support Nebraska's Nongame Wildlife* poster
- *Sandhill Cranes' Spring Migration to Central Platte River Valley* poster
- *Support Nebraska's Nongame Wildlife Fund* poster

Activity 2: Bird Behavior

In Teacher's Guide:

- *Jay Play* OBIS Activity
- *For the Birds* OBIS Activity
- *Bird Sounds* UNSM Activity

In Packet:

- *Bird Sounds* UNSM audio tape
- *Birds of the Backyard Winter into Spring* video (30 min)
- *Peterson Field Guides Eastern/Central Birding by Ear* audio tapes and guide book

Activity 3: Bird Nests

In Teacher's Guide:

- *Bird Nests* OBIS Activity
- *In a Nest* UNSM Activity

Additional Materials:

- Hanging bird nest
- Bowl shaped bird nest
- Eyewitness Books *Birds*
- National Audubon Society *First Field Guide Birds*
- *Golden Guide Birds*
- *Peterson First Guide to Birds of North America*
- *Who's Who in Great Plains Songbirds*

Activity 4: Bird Migration

In Teacher's Guide:

- *Migration Path* UNSM Activity

In Packet:

- Stickers
- Grunko Films *Sandhill Crane-World Migrant* video (31 min)
- Nebraska Game and Parks *Sandhill Cranes: Wings over the Platte*
- UNSM Museum Notes #93 *The Cranes of Nebraska*
- 20 Maps of North America

Additional Materials:

- Rowe Sanctuary *Wonders of Migration* 2nd and 5th grade curriculum
- Map of the World
- Nebraska Game and Parks *Sandhill Cranes' Spring Migration to Central Platte River Valley* poster

Activity 5: Bird Adaptations

See next page

Contents of the Birds Kit

Activity 5: Bird Adaptations

In Teacher's Guide:

- *Flappers* NWF Activity
- *Fill the Bill* NWF Activity
- *Feet are Neat* NWF Activity

In Packet:

- 15 *How Birds Get a Living* reference sheet
- *Eyewitness Books: Birds*
- *Birds, Bird, Birds*

Additional Materials:

- Bird bones
- Two bird skulls
- Five bird wings
- Three bird feet
- Four types of feathers



Additional Resources in the Birds Kit

- NatureWare *North American Birds* CD-ROM
- Nebraska Game and Parks Threatened and Endangered Species Resources
 - Nebraska's Threatened and Endangered Species Bald Eagle*
 - Nebraska's Threatened and Endangered Species Interior Least Tern*
 - Nebraska's Threatened and Endangered Species Mountain Plover*
 - Nebraska's Threatened and Endangered Species Piping Plover*
 - Nebraska's Threatened and Endangered Species Whooping Crane*
- Nebraska Game and Parks Game Bird Resources
 - The Bobwhite Quail in Nebraska*
 - Mallards Past and Present*
 - The Ring-necked Pheasant in Nebraska*
 - The Wild Turkey in Nebraska*
- Nebraska Game and Parks Nebraska Habitat Area Resources
 - Alkaline Wetlands of the North Platte River Valley*
 - Nebraska's Rainwater Basin*
 - Nebraska Salt Marshes: Last of the Least*
 - Platte River Instream Flow – Who Needs It?*

Activity One – Bird Identification

Learning Objectives:

Part 1 - Birdfeeder Learning Objective: Students build a bird feeder to attract birds. Students observe and record the visiting bird types, as well as documenting their eating behaviors.

Part 2 - Using a Field Guide Learning Objective: Students observe bird size, shape, characteristics and field marks. Students draw and record observations, using field guides to identify birds.

OBIS - Outdoor Biology Instructional Strategies, University of California, Berkeley

UNSM - University of Nebraska State Museum

Activity One - Bird Identification

Part 1: *Birdfeeder* OBIS Activity

Overview: Students construct bird feeders, set them up and investigate bird behavior. By experimenting with different conditions, students discover what best attracts birds to the feeders.

Group size: 2 to 30 students

Time: 30 to 50 minutes for construction, observation times will vary

Materials Provided:

In Teacher's Guide:

- *Birdfeeder* OBIS Activity
- 3 *Equipment Cards* (template)
- 1 Set of *Action Cards* (template)

In Packet:

- National Audubon Society *First Field Guide Birds*
- 10 *Waterfowl Identification in the Central Flyway*
- National Geographic Society *Field Guide to the Birds of North America*
- 3 *Golden Guide Birds*
- 3 *Peterson First Guide to Birds of North America*
- *Who's Who in Great Plains Songbirds*
- UNSM Museum Notes #95 "*Windows of Death: A Look at Bird Strikes*"

Additional Materials:

- 15 *How Birds Get a Living* reference sheet (see Bird Adaptations)
- *America's Bald Eagle* poster
- *Endangered Means There is Still Time* poster
- 2 *Help Support Nebraska's Nongame Wildlife* poster
- *Sandhill Cranes' Spring Migration to Central Platte River Valley* poster
- *Support Nebraska's Nongame Wildlife Fund* poster

Supplies Needed Per Feeder:

- 1 Piece of wood at least 12"x16"x1/4" (for base)
- 1 Wooden stake 6"x2"x2" (for freestanding feeders)
- Cardboard at least 16"x5"
- 20 Tacks
- Large nails
- Hammer
- Masking tape
- Scissors or knife (to cut cardboard)
- 2 Jar lids
- Assortment of bird foods (small seeds, large seeds, unsalted sunflower seeds, popped popcorn, raisons, suet, peanut butter)
- 1 Plastic sandwich bag
- 1 Large grocery bag (if students are taking feeders home)
- 5-7 Meters of fishing line (4-6 lb. test monofilament line)
- 1 Copy of *Activity Cards*:
 - *Basic Birdfeeder Equipment Card*
 - *Eyespot Equipment Card*
 - *Bird Model Equipment Card*
 - *Birdfeeder Action Card*

Additional Supplies Needed:

- Construction paper
- Clay
- Crayons and felt pens
- Birdfeeder junk box (with additional birdfeeder construction supplies)

Preparation:

- Make a copy of *Activity Cards* for each birdfeeder being constructed.
- Make one birdfeeder as an example.
- Hang posters

Activity One - Bird Identification

Part 2: *Using a Field Guide UNSM Activity*

Overview: Using field guides, students discover distinguishing characteristics that help them identify birds. Students sharpen their observation skills by drawing field sketches of birds.

Group size: Up to 36 students divided into small groups

Time: About 60 minutes

Materials Provided:

In Teacher's Guide:

- *Bird Identification UNSM Activity*
 - 1 *Field Notes* worksheet (template)
 - 1 *Field Sketch* worksheet (template)

In Packet:

- Field guides:
 - National Audubon Society *First Field Guide Birds*
 - 10 *Waterfowl Identification in the Central Flyway*
 - National Geographic Society *Field Guide to the Birds of North America*
 - 3 *Golden Guide Birds*
 - 3 *Peterson First Guide to Birds of North America*

Additional Supplies Needed Per Student:

- Paper and drawing supplies
- *Field Notes* worksheet
- *Field Sketch* worksheet

Preparation:

- Post the bird posters included in kit around the room where students can refer to them.
- Make copies of:
 - Field Notes* worksheet (one for each student)
 - Field Sketch* worksheet (one for each student)
- Review the introductory sections of the following books to familiarize yourself with how to use a field guide:
 - National Audubon Society *First Field Guide Birds* page 44
 - Waterfowl Identification in the Central Flyway* page 9
 - National Geographic Society *Field Guide to Birds of North America* page 6
 - Golden Guide Birds* page 3
 - Peterson First Guide to Birds of North America* page 5



Activity Two – Bird Behavior

Learning Objectives:

Part 1 - Jay Play Learning Objective: Students observe and record bird food color preference behavior.

Part 2 - For the Birds Learning Objective: Students provide a feeding station to observe and identify eating behaviors.

Part 3 - Bird Sounds Learning Objective: Students identify birds by their sounds and create their own methods of representing birdcalls and songs.

OBIS - Outdoor Biology Instructional Strategies, University of California, Berkeley

UNSM - University of Nebraska State Museum

Activity Two - Bird Behavior

Part 1: *Jay Play* OBIS Activity

Overview: Students first discover what color foods jays prefer to eat. Then they experiment with the food to see if the jays will change their preferences.

Group size: Small groups of 5-10 students/adult

Time: 40 to 60 minutes

Materials Provided:

In Teacher's Guide:

- *Jay Play* OBIS Activity
- 1 Sheet of *Action Cards* (template)

Supplies Needed Per Group:

- 8 oz. Package of macaroni cooked (see preparation section for cooking instructions)
 - 1 Collander
 - Liquid food coloring (red, green, blue and yellow)
 - 6 Plastic bags
- 5 Pencils
- 1 Data board and pen (large paper or dry erase board to record results)
- 1 Small box of table salt
- Flavorings (cayenne, hot sauce, pepper, mustard, almond extract)
- 3 Mixing containers (can be bottom half of milk cartons)
- Paper towels
- 1 Stick or spoon for mixing
- A watch with second hands
- 1 Sheet of *Action Cards*
- Binoculars (optional)
- *Field Guide to Local Birds* (optional)

Additional Materials Included in Kit:

In Packet:

- *Birds of the Backyard Winter into Spring* video (30 min)

Preparation:

- Cook 8 oz package of macaroni. When the macaroni is tender, divide macaroni and cooking water into six bowls. Set two bowls aside. Add 1 tsp. of food coloring to four of the bowls (red, green, blue and yellow). Stir, then let the macaroni sit in coloring for 10 to 15 minutes. Macaroni should be brightly colored. Rinse all the macaroni separately, drain and cool. Place the contents of each bowl in a separate plastic bag. Refrigerate until ready to use, no more than five days. (Each group will need two bags of white macaroni and one of each color. For a large class, prepare more macaroni.)
- Make two copies of the *Action Cards* and cut them apart.



Activity Two - Bird Behavior

Part 2: *For the Birds* OBIS Activity

Overview: Students investigate bird behavior by feeding pigeons, ducks, jays, sparrows, or seagulls. Students pose different problems to solve.

Group size: Almost any size group

Time: 40 to 50 minutes

Materials Provided:

In Teacher's Guide:

- *For the Birds* OBIS Activity
- 1 Sheet of *Action Cards* (template)
- *Equipment Card* (template)

Supplies Needed Per Group of Two:

- 1 Small bag or cup
- 1 Set of *Action Cards*

Supplies Needed Per Class:

- Copies of models card
- Colored construction paper
- 1 Large lump of clay
- Marking pens
- Scissors
- 6 Clear plastic cups
- 6 Pieces of cloth (20 cm x 20 cm)
- Bird foods: Bread, popped corn, birdseed

Additional Materials Included in Kit:

In Packet:

- *Birds of the Backyard Winter into Spring* video (30 min)

Preparation:

- Make one copy of the *Action Cards* for each group of two.
- Make several copies of *Models Equipment Card*.

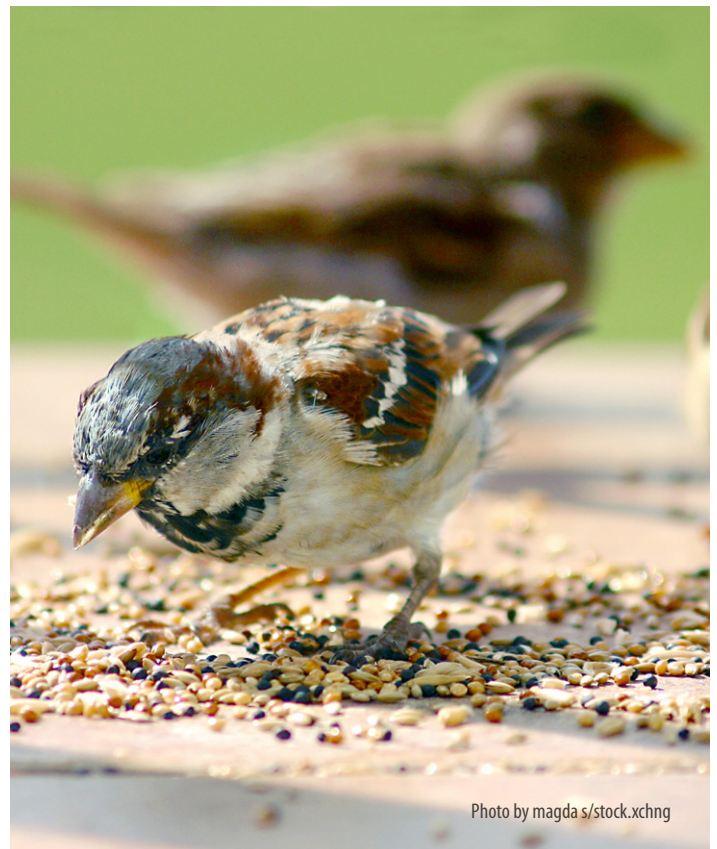


Photo by magda s/stock.xchng

Activity Two - Bird Behavior

Part 3: *Bird Sounds UNSM Activity*

Overview: Students will learn to identify birds by their sounds. A tape provides students with a description of the bird's song, then the song itself, one method of representing the song, and then the song will be repeated. Students will describe or draw the song they hear for each bird.

Group size: Suitable for any size group

Time: About 60 minutes

Materials Provided:

In Teacher's Guide:

- *Bird Sounds* OBIS Activity

In Packet:

- *Bird Sounds* audio tape
- *Describing Bird Sounds* (template)
- *Peterson Field Guides Eastern/Central Birding by Ear*

Additional Materials Provided:

In Packet:

- *Birds of the Backyard Winter into Spring* video

Supplies Needed Per Student:

- 1 Pencil/pen
- 1 Copy of *Describing Bird Sounds*

Supplies Needed Per Class:

- Cassette tape player

Preparation:

- Make one copy of *Describing Bird Sounds* for each student
- Rewind *Bird Sounds* audio tape on side A.
- Familiarize yourself with identifying bird sounds by listening to the first 15 minutes of the introduction to *Birding by Ear* (tape 1A).



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Activity Three – Bird Nests

Learning Objectives:

Part 1 - Bird Nests Learning Objective: Students build bird nests using a wide range of materials. Students create a variety of nests in various shapes and sizes, appropriate for different types of birds.

Part 2 - In a Nest Learning Objective: Students examine nests and record observations about the type of bird using the nests and the environments in which they could be found.

OBIS - Outdoor Biology Instructional Strategies, University of California, Berkeley

UNSM - University of Nebraska State Museum

Activity Three - Bird Nests

Part 1: *Bird Nests* OBIS Activity

Overview: When students construct their own nests they discover the variety of materials birds use in nest building. As students locate a spot to place their nest in a designated area, they discover many different places birds build nests. Nest builders become naturalist as they look for nests placed by other students.

Group size: Almost any size group

Time: 50 to 60 minutes

Materials Provided:

In Teacher's Guide:

- *Bird Nests* OBIS Activity
- *Nesting Notes* (template)
- *Equipment Card* (template)

Supplies Needed Per Student:

- 1 Pencil
- 1 Length of aluminum wire (2 m)
- Scissors
- 1 Thin strip of flagging (2 cm x 15 cm)
- 1 Copy of *Nesting Notes*
- 1 Copy of *Equipment Card*

Additional Supplies Needed Per Class:

- 1 Data board and pen (large paper or dry erase board to record results)
- 2 Containers of water (for making mud)
- Colored flagging (to mark off activity area)

Preparation:

- Make copies of:
 - *Nesting Notes* (one for each student)
 - *Equipment Card* (one for each student)
- Select and mark off two areas (10 m x 10 m) with a variety of trees, shrubs, and grasses, situated so students cannot see the other area.
- Make a nest as a model for students.

Optional:

- Make a wire frame for each youngster if you are short on time.



Swallows make their nests (above) with mud and saliva.
Photo by Ben Lawson

Other birds prefer nests made of grass, twigs, and leaves.
Photo by Margus Kyttä

Activity Three - Bird Nests

Part 2: *In a Nest UNSM Activity*

Overview: Students get a close up view of two different birds nests. Using a field guide, they try to determine who built the nests and the kind of environment the nest is from.

Group size: Suitable for groups of 2-4 at a time

Time: 15-20 minutes

Preparation:

- Arrange the nests and the books on a small table or desk accessible to students.
- Familiarize yourself with bird nests, eggs and hatching by reviewing Eyewitness Books *Bird* pages 44-59.

Materials Provided:

In Teacher's Guide:

- *In a Nest UNSM Activity*

In Bird Identification Packet (Activity One):

- National Audubon Society *First Field Guide Birds*
- Golden Guide *Birds*
- Peterson *First Guide to Birds of North America*
- *Who's Who in Great Plains Songbirds*

In Bird Adaptations Packet (Activity Five)

- Eyewitness Books *Bird*

Oversized in Kit:

- Hanging bird nest
- Bowl shaped bird nest

Supplies Needed Per Student:

- Paper and pencil



Activity Four – Bird Migration

Learning Objectives:

Students discover the Sandhill Cranes' migration path through the central flyway by using scientific data and mapping skills.

University of Nebraska State Museum (UNSM) Activity

Activity Four - Migration Path

Overview: Using data collected by scientists, students plot the routes of Sandhill cranes on maps of North America. They discover why these birds migrate and why the Platte River is so important in their migration.

Group size: Up to 40 students working in groups of two

Time: About 90 minutes (31 minute video and 60 minute activity)

Materials Provided:

In Teacher's Guide:

- *Migration Path UNSM Activity*
- 5 Data sheets

In Packet:

- 20 Migration data sets (5 sheets)
- 20 Small maps of North America
- Stickers (blue, green, red)
- *Sandhill Crane—World Migrant* video
- *Sandhill Cranes Wings Over the Platte*
- UNSM Notes #93: *The Cranes of Nebraska*

Oversized in Kit:

- Large map of the World
- *Sandhill Cranes Spring Migration* poster
- *Wonders of Migration* "Background Information"

Preparation:

- Make a copy of the *Sandhill Crane Migration Data* and cut into individual data sets.
- Cut each sticker sheet into 12 strips with all 4 colors on each strip (students will not use the yellow stickers).
- Post the large map of the World where students can easily reach it.
- Read "Background Information" in *Wonders of Migration* for a brief explanation of migration.
- Each group of two students needs:
 - 1 Small map of North America
 - 1 Data set
 - 1 Strip of stickers (2 each of blue, green, and red)



Activity Five – Bird Adaptations

Learning Objectives:

- Part 1 - Flappers Learning Objective:** Students investigate wingbeats of a variety of bird types and discover the reasons for these differences.
- Part 2 - Fill the Bill Learning Objective:** Students will use tools to demonstrate the adaptations of bird beaks.
- Part 3 - Feet are Neat Learning Objective:** Students create bird feet and explain why their adaptations allow for survival.

From National Wildlife Federation (NWF) Birds, Birds, Birds

Activity Five - Bird Adaptations

Part 1: *Flappers* NWF Activity

Overview: Students match the wingbeats of different birds by flapping their arms. Students will be able to describe three different types of bird flight and explain why some birds have fast wingbeats and others have slower wingbeats.

Group size: Suitable for any size group, divided into groups of two

Time: About 60 minutes

Materials Provided:

In Teacher's Guide:

- *Flapper* NWF Activity

In Packet:

- *Birds, Birds, Birds* – NatureScope

Additional Supplies Needed:

- Watch or clock that shows seconds (one per group of two)
- Chalkboard or large pieces of easel paper
- Chalk/markers

Additional Materials Included in Kit:

In Packet:

- Eyewitness Books *Birds*
- 15 *How Birds Get a Living* reference sheet

Oversized In Kit:

- 5 Bird wings
- Feathers
- Bird bones

Preparation:

- Copy chart on page 7 of *Birds, Birds, Birds* to chalkboard or large piece of paper.
- See *Birds, Birds, Birds* pages 7-8 for a description of *Flappers* activity and page 16 for *Flappers* reproducible page.
- For optional craft activity, make one copy of *Birds, Birds, Birds* page 16, *Flappers* reproducible page, for each student.

Optional Craft Activity Per Student:

- Copy of page 16 *Flappers* reproducible page
- Scissors
- Glue
- 8 Index cards



Activity Five - Bird Adaptations

Part 2: *Fill the Bill* NWF Activity

Overview: Students demonstrate some ways different beaks are adapted to getting different foods. Students will be able to describe five different types of beaks and explain how each is adapted to feed on different foods.

Group size: Suitable for any size group, divided into eight groups

Time: About 60 minutes

Materials Provided:

In Teacher's Guide:

- *Fill the Bill* NWF Activity

In Packet:

- *Birds, Birds, Birds* – NatureScope

Supplies Needed Per Class:

• **Station 1: Nectar**

Tall, thin vase	Eyedropper or straw
Envelope or small fishnet	Water
Large scoop or slotted spoon	

• **Station 2: Worms in the mud**

Large saucepan	Pair of chopsticks
Dry oatmeal (to fill pan)	Nutcracker or pliers
Fake worms or grapes	Strainer

• **Station 3: Seeds**

Nutcracker or pliers	Pair of chopsticks
Whole walnuts or other nuts in the shell	
Tongs	

• **Station 4: Fish and other water animals**

Aquarium or large container	Water
Styrofoam chunks	Pair of chopsticks
Large scoop or slotted spoon	Eyedropper or straw

• **Station 5: Tiny water plants and water animals**

Aquarium or large container	Water
Puffed rice cereal	Strainer
Forceps or tweezers	Tongs

• **Station 6: Flying insects**

Popcorn or mini-marshmallows	Pair of chopsticks
Envelope or small fishnet	Forceps or tweezers

• **Station 7: Caterpillars and other insects**

Small log	Rice
Forceps or tweezers	Nutcracker or pliers
Envelope or small fishnet	

• **Station 8: Fruit**

Stemmed cherries	String
Tongs	Strainer
Eyedropper or straw	

Additional Materials Included in Kit:

In Packet:

- *Bird Eyewitness Book*
- 15 *How Birds Get a Living* reference sheet

Oversized in Kit:

- 2 Bird skulls

Preparation:

- Make one copy of *Birds, Birds, Birds* page 37, *Fill the Bill* reproducible page, for each student.
- Set up eight stations, see materials list for supplies needed at each station.
- See *Birds, Birds, Birds* pgs 29-30 for description of *Fill the Bill* activity and pg 37 for *Fill the Bill* reproducible page.

Activity Five - Bird Adaptations

Part 3: *Feet are Neat* NWF Activity

Overview: Students match birds to their feet and mold bird feet out of clay. Students will be able to describe several types of bird feet and explain how each helps a bird survive in its habitat.

Group size: Suitable for any size group, divided into groups of two

Time: About 60 minutes

Materials Provided:

In Teacher's Guide:

- *Feet are Neat* NWF Activity

In Packet:

- *Birds, Birds, Birds* – NatureScope

Supplies Needed Per Student:

- Clay or modeling dough
- Pipe cleaners
- Tape
- Markers, crayons or colored pencils
- White cardboard or stiff white paper
- Copy of *Crazy Feet are Neat* (p. 39)

Additional Materials Included in Kit:

In Packet:

- Eyewitness Book *Birds*
- 15 *How Birds Get a Living* reference sheet

Oversized:

- 3 Bird feet

Preparation:

- Make one copy of *Birds, Birds, Birds* page 39, *Crazy Feet are Neat* reproducible page, for each student.
- See *Birds, Birds, Birds* page 28 for the *Feet are Neat* activity and page 39 for *Crazy Feet are Neat* reproducible page.



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Nebraska Science Standards

Activity 1: Bird Identification - Part 1: OBIS Birdfeeder

Objectives: Students build a bird feeder to attract birds. Students observe and record the visiting bird types, as well as documenting their eating behaviors.

Grades K-2

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Questioning: SC 2.1.1.a Ask questions that relate to a science topic.

Scientific Investigations: SC 2.1.1.b Conduct simple investigations.

Scientific Observations: SC 2.1.1.d Describe objects, organisms, or events using pictures, words, and numbers.

Scientific Data Collection: SC 2.1.1.e Collect and record observations.

Grades 3-5

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Questioning: SC 5.1.1.a Ask testable scientific questions.

Scientific Investigations: SC 5.1.1.b Plan and conduct investigations and identify factors that have the potential to impact an investigation.

Scientific Observations: SC 5.1.1.d Make relevant observations and measurements.

Scientific Data Collection: SC 5.1.1.e Collect and organize data.

Scientific Interpretations, Reflections, and Applications: SC 5.1.1.f Develop a reasonable explanation based on collected data.

Grades 6-8

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 8.1.1 Students will design and conduct investigations that will lead to descriptions of relationships between evidence and explanations.

Scientific Questioning: SC 8.1.1.a Formulate testable questions that lead to predictions and scientific investigations.

Scientific Investigations: SC 8.1.1.b Design and conduct logical and sequential investigations including repeated trials.

Scientific Controls and Variables: SC 8.1.1.c Determine controls and use dependent (responding) and independent (manipulated) variables.

Scientific Observations: SC 8.1.1.e Make qualitative and quantitative observations.

Scientific Data Collection: SC 8.1.1.f Record and represent data appropriately and review for quality accuracy, and relevancy.

Scientific Interpretations, Reflections, and Applications: SC 8.1.1.g Evaluate predictions, draw logical inferences based on observed patterns relationships, and account for non-relevant information.

SC K-12.3 Life Science

1. Structure and Function of Living Systems

SC 8.3.1 Students will investigate and describe the structure and function of living organisms.

Behavior: SC 8.3.1.e Describe how plants and animals respond to environmental stimuli.

Activity 1: Bird Identification - Part 2: UNSM Using a Field Guide

Objectives: Students observe bird size, shape, characteristics and field marks. Students draw and record observations, using field guides to identify birds.

Grades K-2

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Observations: SC 2.1.1.d Describe objects, organisms, or events using pictures, words, and numbers.

Scientific Communication: SC 2.1.1.f Use drawings and words to describe and share observations with others.

SC K-12.3 Life Science

1. Structure and Function of Living Systems

SC 2.3.1 Students will investigate the characteristics of living things.

Characteristics of Living Organisms: SC 2.3.1.c Identify external parts of plants and animals.

Grades 3-5

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Observations: SC 5.1.1.d Make relevant observations and measurements.

Scientific Communication: SC 5.1.1.g Share information, procedures, and results with peers and/or adults.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 5.3.1 Students will investigate and compare the characteristics of living things.

Characteristics of Living Organisms: SC 5.3.1.b Identify how parts of plants and animals function to meet basic needs.

Grades 6-8

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 8.1.1 Students will design and conduct investigations that will lead to descriptions of relationships between evidence and explanations.

Scientific Observations: SC 8.1.1.e Make qualitative and quantitative observations.

Scientific Communication: SC 8.1.1.h Share information, procedure, results, and conclusions with appropriate audiences.

SC K-12.3 **Life Science**

4. Biodiversity

SC 8.3.4 Students will identify characteristics of organisms that help them survive.

Biological Evolution: SC 8.3.4.c Use anatomical features of an organism to infer similarities among other organisms.

Activity 2: Bird Behavior - Part 1: Jay Play

Objectives: Students observe and record bird food color preference behavior.

Grades K-2

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Questioning: SC 2.1.1.a Ask questions that relate to a science topic.

Scientific Investigations: SC 2.1.1.b Conduct simple investigations.

Scientific Observations: SC 2.1.1.d Describe objects, organisms, or events using pictures, words, and numbers.

Scientific Data Collection: SC 2.1.1.e Collect and record observations.

Scientific Communication: SC 2.1.1.f Use drawings and words to describe and share observations with others.

Grades 3-5

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Questioning: SC 5.1.1.a Ask testable scientific questions.

Scientific Observations: SC 5.1.1.d Make relevant observations and measurements.

Scientific Data Collection: SC 5.1.1.e Collect and organize data.

Scientific Interpretations, Reflections, and Applications: SC 5.1.1.f Develop a reasonable explanation based on collected data.

Scientific Communication: SC 5.1.1.g Share information, procedures, and results with peers and/or adults.

Scientific Communication: SC 5.1.1.h Provide feedback on scientific investigations.

Grades 6-8

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 8.1.1 Students will design and conduct investigations that will lead to descriptions of relationships between evidence and explanations.

Scientific Data Collection: SC 8.1.1.f Record and represent data appropriately and review for quality accuracy, and relevancy.

Scientific Interpretations, Reflections, and Applications: SC 8.1.1.g Evaluate predictions, draw logical inferences based on observed patterns/relationships, and account for non-relevant information.

Scientific Communication: SC 8.1.1.h Share information, procedure, results, and conclusions with appropriate audiences.

SC K-12.3 Life Science

4. Biodiversity

SC 8.3.4 Students will identify characteristics of organisms that help them survive.

Activity 2: Bird Behavior - Part 2: For the Birds Objectives: Students provide a feeding station to observe and identify eating behaviors.

Grades K-2

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Investigations: SC 2.1.1.b Conduct simple investigations.

Scientific Observations: SC 2.1.1.d Describe objects, organisms, or events using pictures, words, and numbers.

Scientific Communication: SC 2.1.1.f Use drawings and words to describe and share observations with others.

Grades 3-5

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Investigations: SC 5.1.1.b Plan and conduct investigations and identify factors that have the potential to impact an investigation.

Scientific Observations: SC 5.1.1.d Make relevant observations and measurements.

Scientific Communication: SC 5.1.1.g Share information, procedures, and results with peers and/or adults.

Scientific Communication: SC 5.1.1.h. Provide feedback on scientific investigations.

Grades 6-8

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 8.1.1 Students will design and conduct investigations that will lead to descriptions of relationships between evidence and explanations.

Scientific Investigations: SC 8.1.1.b Design and conduct logical and sequential investigations including repeated trials.

Scientific Controls and Variables: SC 8.1.1.c Determine controls and use dependent (responding) and independent (manipulated) variables.

Scientific Observations: SC 8.1.1.e Make qualitative and quantitative observations.

Scientific Communication: SC 8.1.1.h Share information, procedure, results, and conclusions with appropriate audiences.

SC K-12.3 Life Science

1. Structure and Function of Living Systems

SC 8.3.1 Students will investigate and describe the structure and function of living organisms.

Behavior: SC 8.3.1.e Describe how plants and animals respond to environmental stimuli.

4. Biodiversity

SC 8.3.4 Students will identify characteristics of organisms that help them survive.

Activity 2: Bird Behavior - Part 3: Bird Sounds

Objectives: Students identify birds by their sounds and create their own methods of representing birdcalls and songs.

Grades K-2

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Investigations: SC 2.1.1.b Conduct simple investigations.

Scientific Observations: SC 2.1.1.d Describe objects, organisms, or events using pictures, words, and numbers.

Scientific Data Collection: SC 2.1.1.e Collect and record observations.

Grades 3-5

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Investigations: SC 5.1.1.b Plan and conduct investigations and identify factors that have the potential to impact an investigation.

Scientific Observations: SC 5.1.1.d Make relevant observations and measurements.

Scientific Data Collection: SC 5.1.1.e Collect and organize data.

Grades 6-8

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 8.1.1 Students will design and conduct investigations that will lead to descriptions of relationships between evidence and explanations.

Scientific Investigations: SC 8.1.1.b Design and conduct logical and sequential investigations including repeated trials.

Scientific Observations: SC 8.1.1.e Make qualitative and quantitative observations.

Scientific Data Collection: SC 8.1.1.f Record and represent data appropriately and review for quality accuracy, and relevancy.

SC K-12.3 **Life Science**

4. Biodiversity

SC 8.3.4 Students will identify characteristics of organisms that help them survive.

Activity 3: Bird Nests - Part 1: Bird Nest OBIS

Objectives: Students build bird nests using a wide range of materials. Students create a variety of nests in various shapes and sizes, appropriate for different types of birds.

Grades K-2

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Investigations: SC 2.1.1.b Conduct simple investigations.

Scientific Observations: SC 2.1.1.d Describe objects, organisms, or events using pictures, words, and numbers.

Grades 3-5

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

3. Technology

SC 5.1.3 Students will solve a simple design problem.

Abilities to do Technical Design: SC 5.1.3.a Identify a simple problem.

Abilities to do Technical Design: SC 5.1.3.b Propose a solution to a simple problem.

Abilities to do Technical Design: SC 5.1.3.c Implement the proposed solution.

Abilities to do Technical Design: SC 5.1.3.d Evaluate the implementation.

Abilities to do Technical Design: SC 5.1.3.e Communicate the problem, design, and solution.

Grades 6-8

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

3. Technology

SC 8.1.3 Students will solve a design problem, which involves one or two science concepts.

Abilities to do Technical Design: SC 8.1.3.a Identify problems for technical design.

Abilities to do Technical Design: SC 8.1.3.b Design a solution or a product.

Abilities to do Technical Design: SC 8.1.3.c Implement the proposed design.

Abilities to do Technical Design: SC 8.1.3.d Evaluate completed technological designs or products.

Abilities to do Technical Design: SC 8.1.3.e Communicate the process of technical design.

Activity 3: Bird Nests - Part 2: UNSM In a Nest

Objectives: Students examine nests and record observations about the type of bird using the nests and the environments in which they could be found.

Grades K-2

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Observations: SC 2.1.1.d Describe objects, organisms, or events using pictures, words, and numbers.

Scientific Communication: SC 2.1.1.f Use drawings and words to describe and share observations with others.

Grades 3-5

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Observations: SC 5.1.1.d Make relevant observations and measurements.

Scientific Interpretations, Reflections, and Applications: SC 5.1.1.f Develop a reasonable explanation based on collected data.

Grades 6-8

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 8.1.1 Students will design and conduct investigations that will lead to descriptions of relationships between evidence and explanations.

Scientific Observations: SC 8.1.1.e Make qualitative and quantitative observations.

Scientific Interpretations, Reflections, and Applications: SC 8.1.1.g Evaluate predictions, draw logical inferences based on observed patterns/relationships, and account for non-relevant information.

Activity 4: Bird Migration

Objectives: Students discover the Sandhill Cranes' migration path through the central flyway by using scientific data and mapping skills.

Grades K-2

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Investigations: SC 2.1.1.b Conduct simple investigations.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 2.3.1 Students will investigate the characteristics of living things.

Characteristics of Living Organisms: SC 2.3.1.b Identify the basic needs of living things.

Grades 3-5

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Interpretations, Reflections, and Applications: SC 5.1.1.f Develop a reasonable explanation based on collected data.

2. Nature of Science

SC 5.1.2 Students will describe how scientists go about their work.

Scientific Knowledge: SC 5.1.2.a Recognize that scientific explanations are based on evidence and scientific knowledge.

SC K-12.3 **Life Science**

3. Flow of Matter and Energy in Ecosystems

SC 5.3.3 Students will describe relationships within an ecosystem.

Grades 6-8

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 8.1.1 Students will design and conduct investigations that will lead to descriptions of relationships between evidence and explanations.

Scientific Interpretations, Reflections, and Applications: SC 8.1.1.g Evaluate predictions, draw logical inferences based on observed patterns/relationships, and account for non-relevant information.

2. Nature of Science

SC 8.1.2 Students will apply the nature of science to their own investigations.

Scientific Knowledge: SC8.1.2.a Recognize science is an ongoing process and the scientific community accepts and uses explanations until they encounter new experimental evidence not matching existing explanations.

SC K-12.3 Life Science

1. Structure and Function of Living Systems

SC 8.3.1 Students will investigate and describe the structure and function of living organisms.

Behavior: SC8.3.1.e Describe how plants and animals respond to environmental stimuli.

3. Flow of Matter and Energy in Ecosystems

SC 8.3.3 Students will describe populations and ecosystem.

Activity 5: Tracks and Traces - Part 1: NWF Flappers

Objectives: Students investigate wingbeats of a variety of bird types and discover the reasons for these differences.

Grades K-2

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Investigations: SC 2.1.1.b Conduct simple investigations.

Mathematics: SC 2.1.1.g Use appropriate mathematics in all aspects of scientific inquiry.

SC K-12.3 Life Science

1. Structure and Function of Living Systems

SC 2.3.1 Students will investigate the characteristics of living things.

Grades 3-5

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Investigations: SC 5.1.1.b Plan and conduct investigations and identify factors that have the potential to impact an investigation.

Mathematics: SC 5.1.1.i Use appropriate mathematics in all aspects of scientific inquiry.

SC K-12.3 Life Science

1. Structure and Function of Living Systems

SC 5.3.1 Students will investigate and compare the characteristics of living things.

Activity 5: Tracks and Traces - Part 2: NWF Fill the Bill

Objectives: Students will use tools to demonstrate the adaptations of bird beaks.

Grades K-2

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Data Collection: SC 2.1.1.e Collect and record observations.

SC K-12.3 Life Science

1. Structure and Function of Living Systems

SC 2.3.1 Students will investigate the characteristics of living things.

Grades 3-5

SC K-12.1 Inquiry, the Nature of Science, and Technology

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Observations: SC 5.1.1.d Make relevant observations and measurements.

Scientific Data Collection: SC 5.1.1.e Collect and organize data.

Scientific Interpretations, Reflections, and Applications: SC 5.1.1.f Develop a reasonable explanation based on collected data.

SC K-12.3 Life Science

1. Structure and Function of Living Systems

SC 5.3.1 Students will investigate and compare the characteristics of living things.

4. Biodiversity

SC 5.3.4 Students will describe changes in organisms over time.

Biological Adaptations: SC 5.3.4.a Describe adaptations made by plants or animals to survive environmental changes.

Grades 6-8

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 8.1.1 Students will design and conduct investigations that will lead to descriptions of relationships between evidence and explanations.

Scientific Observations: SC 8.1.1.e Make qualitative and quantitative observations.

Scientific Data Collection: SC 8.1.1.f Record and represent data appropriately and review for quality accuracy, and relevancy.

Scientific Interpretations, Reflections, and Applications: SC 8.1.1.g Evaluate predictions, draw logical inferences based on observed patterns/relationships, and account for non-relevant information.

SC K-12.3 **Life Science**

4. Biodiversity

SC 8.3.4 Students will identify characteristics of organisms that help them survive.

Biological Adaptations: SC 8.3.4.a Describe how an inherited characteristic enables an organism to improve its survival rate.

Activity 5: Tracks and Traces - Part 3: NWF Feet are Neat

Objectives: Students create bird feet and explain why their adaptations allow for survival.

Grades K-2

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 2.1.1 Students will ask questions and conduct investigations that lead to observations and communication of findings.

Scientific Communication: SC 2.1.1.f Use drawings and words to describe and share observations with others.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 2.3.1 Students will investigate the characteristics of living things.

Grades 3-5

SC K-12.1 **Inquiry, the Nature of Science, and Technology**

1. Abilities to do Scientific Inquiry

SC 5.1.1 Students will plan and conduct investigations that lead to the development of explanations.

Scientific Interpretations, Reflections, and Applications: SC 5.1.1.f Develop a reasonable explanation based on collected data.

SC K-12.3 **Life Science**

1. Structure and Function of Living Systems

SC 5.3.1 Students will investigate and compare the characteristics of living things.

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Bird Nests



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