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BIRDS IN THE PLANETARIUM? Teacher's Guide

This Teacher's Guide for the *Birds in the Planetarium?* program is designed to help you prepare your students for their upcoming visit to the planetarium when it arrives at your school. The program will emphasize the uniqueness of birds and their adaptations to their environments. Bird migration will be discussed, which will lead us to the stars and how some birds actually use the stars to navigate during their migration. This will lead us on a minor tangent to point out some constellations of birds seen in the sky.

Because this program is available to several different grade levels, you may find some of the activities in this guide to be inappropriate for your particular students. Please look over all the activities and use only those that you find appropriate and useful.

BIRD TRIVIA

Did you know that:

•The Ruby Throated Hummingbird, the only hummingbird found east of the Mississippi, flies non-stop for 600 miles across the Gulf of Mexico each year during its fall and spring migrations?

•Many scientists believe that birds are more closely related to the dinosaurs than any other type of creatures alive today?

•Many of your summer "back yard" birds fly to South America every winter and that they will return to your same back yard year after year?

•The fastest flying birds are Swifts that have been clocked at over 200 miles per hour (320 km/hour)?

•The first known bird was called the Archaeopteryx? It lived 150 million years ago and it had teeth in its beak and claws on its wings!

•The tallest and heaviest bird today is the Ostrich, which is over 8 feet tall and weighs over 345 pounds?!

•The fastest swimming birds are Penguins? They can swim over 25 miles per hour!

•Blue jays have no actual blue pigment in their feathers? Their features are actually clear and only look blue because of the way they refract the light.

CAMOUFLAGE: The protective coloration that lets birds hide in their environment. This is why female birds are not as colorful as males – because they spend more time on the nest and therefore need more camouflage.

FLEDGLING: A young bird that has just begun to learn how to fly.

GIZZARD: A muscular part of a bird's digestive system that grinds hard-to-digest food. It often contains small stones that aid in this process.

HABITAT: The area the bird spends most of its time in.

MIGRATION: A seasonal movement from one area to another. Many birds found in North America migrate to South America during the cold winter months.

MOLTING: The act of shedding and replacing feathers.

ORNITHOLOGY: The study of birds.

ORNITHOLOGIST: A person who studies birds.

PELAGIC BIRDS: Birds that spend most of their lives off-shore and far from land.

PREEN: To clean and straighten feathers.

TERRITORY: The part of a bird's habitat that it defends from other birds, especially birds of its own species.

WARM BLOODED: Any creature that can maintain a constant body temperature. All birds are warm blooded – so are all mammals.

PROJECT IDEAS

Create a Nest: To have your students better understand the skill a bird must have to build a nest, give them string, twigs, leaves, and soil. Tell them this is all that most birds have to work with to build their nests and that they don't even have hands! Have them try to build a small bird's nest from this material. They will learn that making a bird's nest is not easy. Compare your students' nest with a real bird nest (please do not take nests in spring or summer when birds are breeding). Also, it is a good idea to discourage your students from collecting bird's nests as many birds will use them for many years in a row.

Bird Feeder: Buy or build a bird feeder to have outside the window of your classroom. Have your students keep records of what birds visit your feeder. Try different types of bird food (sunflower seeds, cracked corn, millet, thistle seed, suet, peanut butter, peanuts, dried fruit, etc.) and see which birds eat which kinds of food. Try scattering some food on the ground. Do different birds feed on the ground than at the feeder?

State Birds: Every state has a state bird. In Maine, the state bird is the chickadee. Have your students look up the state birds of all the states. This can unite birds with using the library, reading, geography and art.

Bulletin Boards: **1.** Create a "Bird Alphabet" by having your students name a bird that begins with each letter. Have them each draw a bird with the letter and place it on the bulletin board.

2. After discussing why different birds have specially shaped beaks, feet, wings, etc., have students make up their own kind of bird using their own combination of different beaks and feet. Have them cut out their "New Bird Creations" and put them on a bulletin board with a scene already on it of a tree with grass near a pond. Have them place their new bird where it belongs in the scene.

3. Draw a big picture of a bird on the bulletin board. Have your students collect feathers and then have them glue the feathers on the picture. Discuss with them the different kinds of feathers.

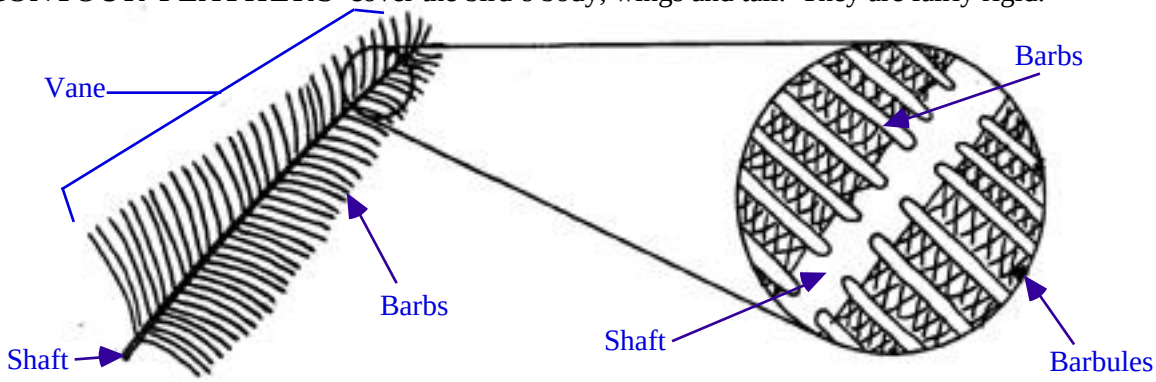
Letter Writing and Art: Have your students draw pictures and write thank you letters after our visit. Have them discuss what parts of the program they liked best, or what they learned during the planetarium visit. This is a good way to integrate the study of birds with English class. We love getting mail!!

Bird Walk: Take your students on a "Quiet Hike" outside of your school looking for birds. Have them be very quiet so they will not frighten the birds. Have them look in trees, on houses, on the ground, in bushes, in barns, on telephone lines, on snow banks, in the air, in a pond, in a puddle, etc. Have them listen very carefully; often times you can hear birds that you might not see. Try to identify the birds you see. Have them make a note where they see them (i.e. air, water, tree, building, wire, etc.). Discuss what the birds were doing. List how many different birds you saw on the walk, what each birds was doing, and which ones you saw most often.

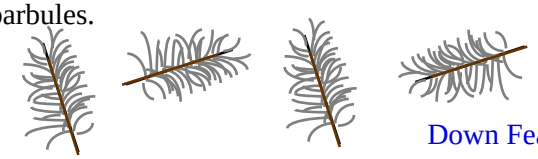
Feathers: Pass out a feather to each student. Have them examine the feather very carefully, with a magnifying glass if one is available. Note the different parts of a feather (parts are described in other part of this Teacher's Guide). Discuss why birds have feathers. Do they help them fly? Do they keep them warm? Are they ever replaced? Are all feathers alike?

FEATHERS: Different kinds and their parts

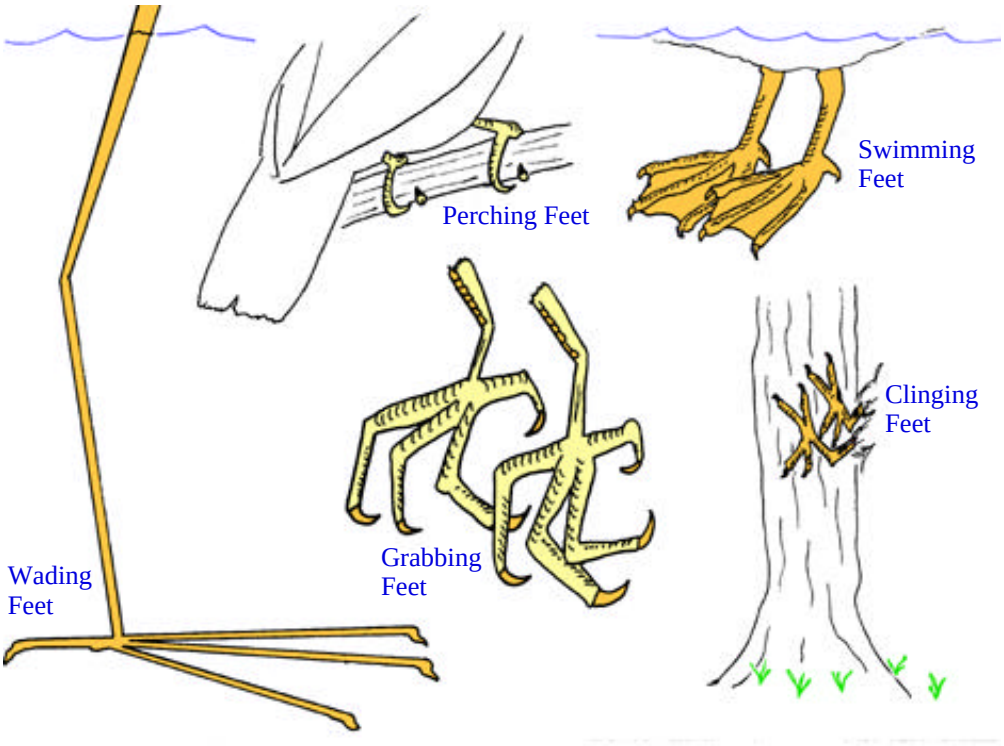
CONTOUR FEATHERS cover the bird's body, wings and tail. They are fairly rigid.



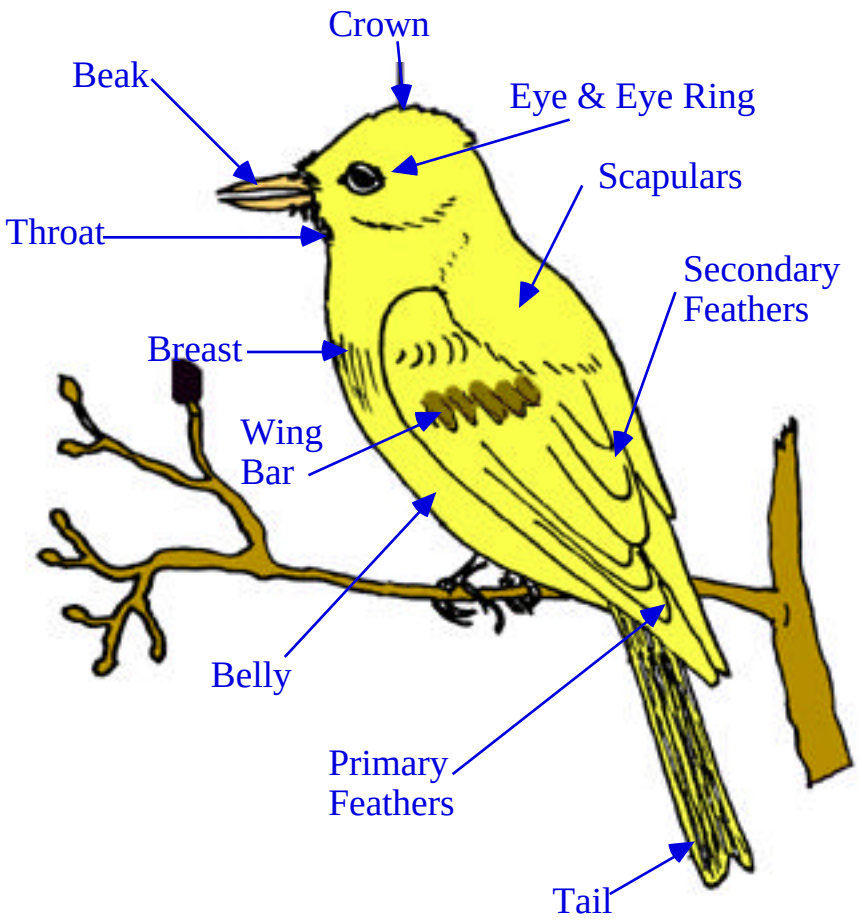
DOWN FEATHERS are fluffier, softer and smaller than contour feathers. They are found underneath the contour feathers and are used for providing warmth. Also, the barbs of down feathers are not attached together with barbules.



FEET: DIFFERENT FEET FOR DIFFERENT PLACES



BIRD PARTS



PRIMARIES and **SECONDARIES** are two different layers of feathers found on a bird's wing.

SCAPULARS are feathers that cover the area where the wings attach to the bird's body.

MATCH GAME

Match the beak type with the food it's designed to eat. Good luck!

BIRDS IN THE PLANETARIUM?
WORD SEARCH GAME

Try to find the words listed on the bottom of the page hidden within this puzzle. Words may be written horizontally, vertically or diagonally. Good luck and have fun!

(Teachers: Discuss and examine how each word relates to birds.)

W	**O**	**O**	**D**	**P**	**E**	**C**	**K**	**E**	**R**	**G**	**O**	**B**	**B**	**L**	**E**
P	**O**	**R**	**F**	**E**	**A**	**T**	**H**	**E**	**R**	**D**	**V**	**L**	**W**	**N**	**R**
L	**C**	**R**	**O**	**W**	**L**	**X**	**A**	**G**	**O**	**O**	**S**	**E**	**R**	**E**	**T**
A	**R**	**S**	**M**	**S**	**C**	**A**	**W**	**N**	**B**	**P**	**R**	**H**	**V**	**S**	**Z**
N	**T**	**H**	**R**	**S**	**D**	**N**	**K**	**S**	**I**	**N**	**S**	**E**	**C**	**T**	**S**
E	**G**	**I**	**Z**	**Z**	**A**	**R**	**D**	**G**	**N**	**S**	**T**	**S**	**C**	**S**	**O**
T	**A**	**L**	**O**	**N**	**S**	**M**	**B**	**E**	**A**	**K**	**C**	**A**	**H**	**R**	**A**
A	**U**	**H**	**O**	**O**	**T**	**H**	**I**	**I**	**H**	**O**	**N**	**K**	**I**	**W**	**R**
R	**T**	**F**	**V**	**O**	**Z**	**F**	**L**	**C**	**R**	**N**	**C**	**T**	**C**	**L**	**T**
I	**F**	**M**	**T**	**C**	**N**	**H**	**L**	**T**	**E**	**D**	**U**	**C**	**K**	**N**	**U**
U	**E**	**R**	**R**	**L**	**H**	**V**	**G**	**Y**	**R**	**U**	**S**	**G**	**A**	**V**	**R**
M	**I**	**G**	**R**	**A**	**T**	**I**	**O**	**N**	**X**	**J**	**R**	**Z**	**D**	**H**	**K**
R	**M**	**L**	**O**	**W**	**L**	**S**	**C**	**P**	**E**	**R**	**C**	**H**	**E**	**A**	**E**
Q	**U**	**Z**	**X**	**S**	**I**	**N**	**G**	**K**	**E**	**G**	**L**	**T**	**E**	**T**	**Y**
C	**H**	**E**	**E**	**P**	**K**	**N**	**J**	**S**	**E**	**E**	**D**	**S**	**R**	**C**	**P**
D	**F**	**L**	**A**	**P**	**T**	**E**	**G**	**G**	**A**	**N**	**H**	**C**	**P**	**H**	**S**
Q	**U**	**A**	**C**	**K**	**P**	**A**	**R**	**T**	**R**	**I**	**D**	**G**	**E**	**X**	**R**

BEAK	BILL	BIRDS	CAW	CHEEP	CHICKADEE
CHICKEN	CLAW	CROW	DUCK	EGG	FEATHER
FLAP	FLY	GIZZARD	GOBBLE	GOOSE	HATCH
HAWK	HONK	HOOT	INSECTS	LOON	MIGRATION
MICE	NEST	OWL	PARTRIDGE	PERCH	PLANETARIUM
QUACK	ROBIN	SEEDS	SING	SOAR	TAIL
TALONS	TUFT	TURKEY		WORMS	WOODPECKER

BIRDS BIBLIOGRAPHY:

FIELD GUIDES:

A Field Guide to the Birds East of the Rockies, 4th Edition, by Roger Tory Peterson (Houghton Mifflin Co., 1980)

A Field Guide to Bird Songs of Eastern and Central North America, 2nd Edition, (Houghton Mifflin Co., 1983) A recording of over 200 bird songs and calls.

National Geographic Society Field Guide to the Birds of North America, 2nd Edition, edited by Shirley L. Scott (National Geographic, 1987)

The Audubon Society Field Guide to North America Birds: Eastern Region, by John Bull and John Farrand (Alfred A. Knopf, 1977)

GENERAL INFORMATION:

Bird Migration by Chris Mead (Facts on File Publications, 1983)

The Backyard Bird Watcher by George H. Harrison (Simon & Schuster, 1979)

The Complete Birder by Jack Conner (Houghton Mifflin Co., 1988)

Eastern Birds of Prey by Neal Clark (Thorndike Press, 1983)

A Guide to Bird Behavior, Volumes I, II & III by Donald and Lillian Stokes (Little Brown & Co., 1979, 1983 & 1989)

Invite a Bird to Dinner: Simple Feeders You Can Make by Beverly Courtney Cook (Lothrop, Lee and Shepard Co., 1978)

Ranger Rick's Nature Scope: Birds, Birds, Birds! Judy Braus (National Wildlife Federation, 1985)

1001 Questions Answered About Birds by AD and HG Cruickshank (Dover Publications, 1976)

CHILDREN'S BOOKS:

Baby Birds and How They Grow by Jane R. McCavley (National Geographic, 1983)

Have You Ever Heard of a Kangaroo Bird? by Barbara Brenner (Coward, McCann & Geoghegan, 1980) About unusual birds for intermediate students.

Jacob and the Owl: A Story by Ada & Frank Graham (Coward, McCann & Geoghega, 1981) About a boy who finds an injured owl. For intermediate.

When Birds Change Their Feathers by Roma Gans (Thomas Y Crowell, 1980)

A Year of Birds by Ashley Wolff (Dodd, Mead & Co., 1984)

Planetarium Program Evaluation

After the Northern Stars Planetarium has visited your class, please take a moment to fill out this evaluation. Your suggestions are very valuable to us!

Mail the completed evaluation to :.....Northern Stars Planetarium
15 Western Ave.
Fairfield, Maine 04937
Or Email To :.....info@northern-stars.com

1. Show Name: _____

2.Group grade/age level:_____

3. Was the material presented at an appropriate level for your class? _____

_____

4. Was the amount of material discussed: Enough Overwhelming Not Enough

5. Should any parts of the presentation be developed further? _____. If so, which parts?

6. Was there sufficient time for questions and answers? Yes No

7. Were you studying astronomy or another related subject at the time of the planetarium's visit?
Yes No
If so, was the planetarium visit helpful? _____

8. Was the Teacher's Guide helpful in preparing your class for the planetarium visit? Yes No
Which parts were most helpful? _____
Which parts were least helpful? _____

9. Did the presenter present the material in a clear and understandable fashion? _____

10. How would you rate the overall program given to your class in the planetarium? _____

_____

_____

11. (Optional) Your name & school:_____

Thank you for your time! Your Comments Make a Difference!