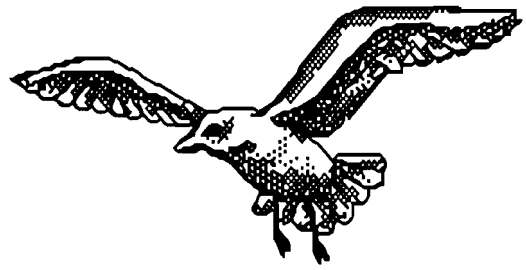


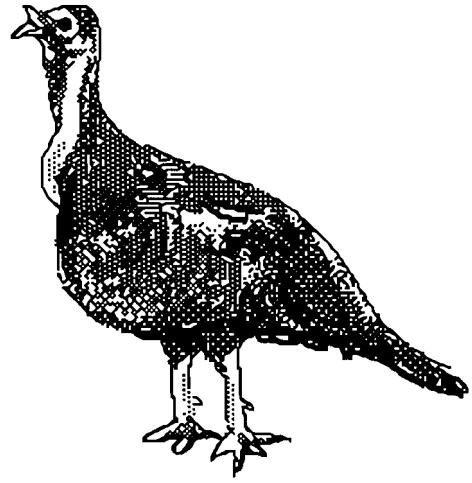
The Bird Project

June 20, 1997

Dr. Truedson

By:

Dave Gregoire
Chad Kaddatz
Mike Stewart
Mark Studer



Minnesota Department of Children Families and Learning
Performance package
Minnesota Profile of Learning
Content Standard M.1

Student _____

Course _____ Title of Package/Activity: **Bird Project**

Summary Statement of Content Standard

Use scientific inquiry and logical reasoning to answer questions, solve problems and communicate results.

Description of Student Performances:

	Performance Record	Achievement
Task 1: Describe the physical and behavioral characteristics of a chosen bird species, as well as the bird's habitat	Date:	Rating:
Task 2: Write a report using research findings and direct observation and prepare, and present a three to five minute oral report on the chosen bird.	Date:	Rating:

Final Achievement Grade/Rating: 4 3 2 1

Scoring Criteria:

* This scale is a scoring guideline, which will be modified as state-wide implementation progresses:

Key: 4 = Performance on this standard achieves and exceeds expectations of high standard work
3 = Performance on this standard meets the expectations of high standard work.
2 = Work on this standard has been completed, but all or part of the students performance is below high standard level.
1 = Work on this standard has been completed, but performance is substantially below high standard level

District Science Objectives
7th Grade

1. Demonstrate a working knowledge of the scientific method.

2. Understand cell theory.

3. Differentiate plant and animal cell structures and their functions.

4. Understand viruses.

5. Recognize the basic characteristics of moneran cells.

6. Understand moneran roles in ecosystems and their impact on our lives.

7. Understand the basic characteristics of fungi and their role in ecosystems.

8. Differentiate the simple and complex plant's basic structures and functions.

9. Differentiate the simple and complex animal's basic structures and functions.

10. Explain relationships between organisms and their environment.

11. Recognize that biomes are a result of abiotic factors.

12. Recognize that certain events or conditions seem to be repeated at regular intervals.

13. Understand effects humans have on their environment.

Bird Research Performance Package

Class: 7th Science

Project Name: The Bird Project

Standard: Inquiry m.1 and Sciences m.1 (living systems, direct observation, conducting research and communicating findings).

What it is all about: The purpose of this project is to provide an opportunity for students to research, observe, organize, and communicate findings on a particular bird which visits Minnesota at some time during the year. Each student will construct a packet of information which will be evaluated in science class.

What you will know:

1. Bird name
    a. Scientific name (genus and species)
    b. Include what kingdom, phylum, class, order and family your bird belongs to.
    c. Common name
2. Characteristics of your bird
    a. What special feathers does it have?
    b. What color is the plumage? (both male and female)
    c. How long is your bird from beak to tail?
    d. What is its wingspan?
    e. What is the beak adapted for?
    f. What are its feet used for?
3. Nesting ,growth and development of your bird
    a. What kind of nest does it make? (out of what material)
    b. Where is the nest found? (be specific)
    c. How many eggs are in the clutch?
    d. What color are the eggs?

e. How long is the incubation period?

f. Are there young altricial or precocial? (you will need to look up these terms in the dictionary)

4. General habitat features
    a. How would you describe your birds habitat? (swamp, forest, prairie,shore or a combination of these)
    b. What does your bird eat?
    c. What are its natural enemies?
5. Behavior characteristics
    a. Describe your birds movement throughout the year. (migration)
    b. Use a map of the U.S. to demonstrate winter and summer grounds for your bird.
    c. Is your bird social or solitary?
    d. Describe what sounds or songs your bird makes.

What you will do:

1. General bird research
    a. Design or build a bird house for your bird?
    b. Record your direct observations or personal experiences with the bird in a journal. (video?)
    c. Will it be possible to observe your bird on our field trip?
    d. Create a title page using a computer format.
    e. Give a brief oral presentation on your research.
    f. Read and discuss articles on bird migration and populations.
    g. Measure bird feathers and determine and draw proportional declines.
2. Report guidelines
    a. title page.
    b. Bibliography- you must use at least three sources.

1. Book- title, author, date published.
2. Encyclopedia- name of encyclopedia, volume and year published.
3. Magazine- name of magazine, year and month published and title of article.
4. Poster- name of poster, publisher and date

c. Report must be two and one half pages typed (size 12 type), double spaced or three and one half pages hand written.

d. Include two pictures of your bird of which one must be hand drawn.

e. Due date is_____.

How you will be evaluated:

a. Content- grasp of facts (40 pts).

b. Bibliography- use and variety of appropriate sources (10 pts).

c. Drawings and picture- hand drawn and magazine pictures of your bird (10 pts).

d. Neatness and spelling- neatly written and organized (10 pts).

e. Bird journal (10 pts).

f. Oral presentation (20 pts).

g. Lab evaluations (20 pts).

BIRD PROJECT

LAB #1

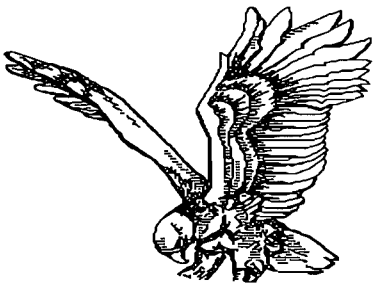
MATCH THE BIRD'S FEET

Purpose: In this lab you will be asked to match a particular birds feet and their function with the bird they belong to.

Procedure: Obtain a worksheet, then place the ten different bird pictures in front of you. Next, place the bird feet samples under the pictures. Each picture has a separate number. Each bird foot has a separate letter. As a group of four, at your table complete the worksheet matching the birds with their feet. .

The following birds are pictured... bald eagle, wood duck, ring-necked pheasant, canada goose, ruffed grouse, snowy owl, mourning dove, american bittern,eastern bluebird and great blue heron. The following are functions... wading, grasping, running, perching and swimming.

1. Example



B. 

Grasping

Materials: Bird feet samples or paper samples, bird pictures, feet function titles and lab # 1 worksheets.

Evaluation: This worksheet must be done with 100% accuracy. When you are finished return your worksheet to the instructor for correcting. You can repeat the lab as many times as necessary for 100% accuracy.

Extensions: Students can furthur explore this lab by making a collage of birds and their feet from pictures in magazines brought from home.

Bird Project

Lab #2

Feather Measurement

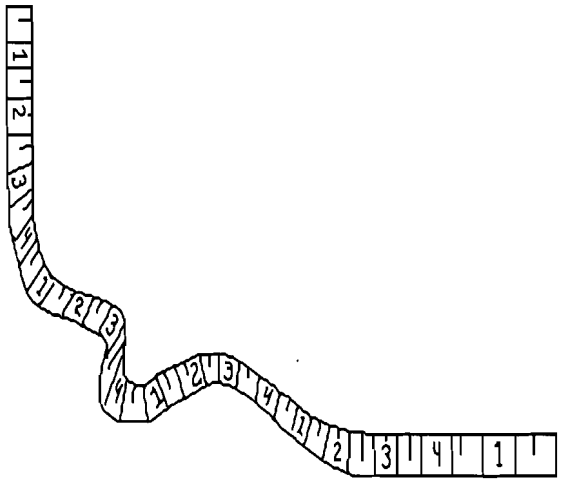
Purpose: The purpose of this lab is to allow students the opportunity to take measurements of a feather, record the data, and present to another student to make a copy using only the data.

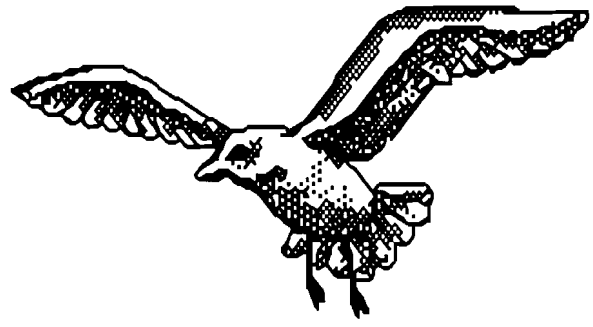
Materials: Box of feathers; metric rulers; calculators; drawing paper

Procedure: Students will first be organized into pairs. Next, each student will then be given a different feather. The feather should be viewed in private, since they are producing data for their partner to use. They will then be given time to look at their feathers carefully. Each student will then begin collecting measurements in centimeters of their feather. When the measurement is completed, each student will give their data table to their partner. They will then have to reproduce the feather from the data that they have been given. Some of the students will be required to complete their drawings with an increase or decrease of a certain percentage of the original data. After competing the drawing, each student will then be given the feather to compare to their. With the remaining time, students can try different feathers, partners, and size differences.

Evaluation: Each student will be required to complete a drawing of the feather for a passing grade. Since each feather is different and that they will be using their partners data, only pass/ no pass grades will be used.

Extensions: Students can further explore this lab by bringing in drawings from feathers that they have at their home or ones that they have brought to school.





Bird Project
Lab #3
Birds, Beaks and BB's

Purpose : To show how different features and shapes of birds beaks affect the function of that beak.

Materials :

- Plastic spoons (2 per group)
- Plastic forks (2 per group)
- Screws (2 per group)
- Small cups (2 per group)
- Beak/Bill pictures
- Toothpicks (2 per group)
- Popsicle sticks (2 per group)
- B.B.'s
- Tape

Procedure :

1. Students will be in groups of 2-4.
2. Each group will have a student tape a set of popsicle sticks to their thumb and index finger.
3. In 30 seconds the student will try to pick up BB's from cup A, and place them into cup B.
4. After 30 seconds count the number of BB's that were placed into cup B and record on your data table.
5. Repeat steps 2-4 using spoons, forks, toothpicks and screws.

Type of "Beak"	Number of BB's picked up
Spoon	
Popsicle stick	
Fork	
Toothpick	
Screw	

Evaluation:

1. Which type of "beak" was able to pick up the most BB's?
2. Which type of "beak" picked up the least amount of BB's?
3. For each type of "beak", write down one task that it would be best used for.

Extensions:

1. Use pictures of bird beaks to identify their main function.
2. The student will then use this information to determine the function and use of their chosen birds beak.

Bird Project

Lab 4
Bird Migration and Population Declines

Purpose: To understand and appreciate the need for global awareness and action in helping to preserve and maintain species diversification.

Materials:

1. Articles on bird migration
2. Copies of world maps and maps of the United States.
3. Question sheet for article " Requiem for the Songbird: Perilous Decline Puzzles Scientists".
4. Student Bird Reports
5. Colored pens, pencils, markers
6. Construction paper
7. Rulers and scissors

Procedures:

1. With your parents or guardians read and discuss the article handed out and answer the questions on the sheet given you.

2. In your assigned group discuss the article you read and the questions you answered.

3. As a group read the next two articles and develop at least two questions and answers per article that focus on the important ideas in the articles.

4. As a group design a bird sanctuary for the birds in your group.

Evaluation:

1. Questions answered correctly and sheet initialed by parent or guardian. (10 pts)
2. Participation in group discussion on article. (5 pts)
3. Thoughtful questions and answers developed by the group (5 pts)
4. Bird sanctuaries designed meet the birds's needs. (15 pts)

Extensions:

1. Draw and color your bird's migration patterns.
2. Use Internet to research additional information on bird migration and population declines. For starters try "Partners in Flight" (www.pwrc.nbs.gov/pif/), "National Audubon Society (www.audubon.org), or "All the breeding birds survey data" (www.mbr.nbs.gov).
3. Interview a member of the local Audubon Society chapter concerning bird population declines and report findings to the class.

Name:_____
Class:_____

Requiem for the Songbird
Questions

1. What have scientists at the Palomarin field station been doing for the past 30 years? _____

_____

2. What have studies at the Palomarin field station shown? _____

_____

3. Where do neotropical birds spend the winter? _____

4. What group of birds has been hardest hit by population declines? _____

5. Why do scientists think many bird populations are declining? _____

6. What bird has been part of the reason some other bird populations are declining?

_____ Why? _____

_____

7. How can problems in South America affect the population of a bird that spends the summer in the United States? _____

_____

8. What is the "BBS" and how has it helped us better understand bird populations?

_____

_____

9. What do most scientists agree on concerning bird populations? _____

_____

Requiem for the Songbird: Perilous Decline Puzzles Scientists

The migratory birds are dropping in number, but observers disagree on scale of the problem

By Daniel Sneider
Staff writer of The Christian Science Monitor

POINT REYES, CALIF.

HIGH in a California live oak, a Wilson's warbler – a small, yellow-green songbird with a glistening black cap – engages in a ritual of spring. The warbler belts out his sharp, staccato song. "This is my territory," he is saying, beckoning a female to join his leafy kingdom.

With equal ritual, Julian Wood, a young biologist, carefully notes the call and its location. Around him, among the scrub brushes and stands of oak and pine on a bluff above the Pacific Ocean, stakes carefully demarcate sections in which scientists keep count of every breeding pair of birds.

WHAT'S FOR DINNER? *The MacGillivray's warbler winters in an area stretching from New Mexico to Panama. Warblers are among the most threatened birds.*

For 30 years, scientists here at the Palomarin field station of the Point Reyes Bird Observatory have been counting and studying the breeding birds.

But since the 1980s, scientists here, as elsewhere, have grown alarmed at what their studies are showing – widespread and significant declines in the numbers of neotropical migratory birds. These birds winter in the tropics of Central and South America and breed in the northern part of the hemisphere.

Hardest hit are songbirds – sparrows, warblers, orioles, and other denizens of river basins, grasslands, and forests. Often invisible to the eye, their lilting burbles fill the early morning air.

"A half a dozen years ago, when news of the declines hit the scientific world and the public, people were aghast," says Peter Stangel of the National Fish and Wildlife Foundation. "A lot of birdwatchers knew something was wrong, but they did not know the scale of the problem."

The numbers can be dramatic. Of 30 songbirds that breed at the Palomarin field station, 17 species are in significant decline. The Wilson's warbler population has dropped by almost 10 percent each year over the past 15 years, while farther inland, in California's Central Valley, the species has virtually stopped nesting.

"These birds are getting hammered," says Daniel Evans, executive director of the Point Reyes Bird Observatory. "Migration as we know it is going to disappear in our lifetime."

But scientists debate both the scope and the causes of the problem. While the specifics may vary depending on the species, most point to habitat loss at both ends of the migratory path due to development as a major reason for the declines. Northern forests have been fragmented by the sprawl of suburban development, while tropical rain forests have been wiped away to make room for cattle ranches in Mexico and Central America.

In the breeding grounds, changes in habitat have most severely affected birds that nest in grasslands and scrub, says biologist Sam Droege. In the West and Midwest, grassland species such as sparrows, meadowlarks, and bobolinks have been severely affected by farming techniques including the use of herbicides and pesticides.

In the East, birds that nest low to the ground in young trees and scattered bushes, such as yellow-breasted chats and white-eyed vireos, are vulnerable to a proliferation of predators, including house cats, raccoons, and possums.

Forest fragmentation, particularly in the Eastern United States, has contributed to the growth of another threat – the brown-headed cowbird. The cowbird acts as a parasite, laying its own eggs in the nests of other birds, and because most birds nest near the forest edge, forest fragmentation has made their nests more accessible. The result: The cowbird now affects more than 200 species and is considered responsible for the near extinction of the Kirtland's warbler.

Even when habitat is preserved in the US, the birds can face equally severe threats in their wintering grounds from habitat loss, mainly in tropical forests. In the mountains of the northern Andes, the wintering grounds of the the blue and white cerulean warbler have been largely deforested, contributing to the rapid decline of that bird, biologists report.

"Very few bird species can tolerate this gantlet of problems," says Mr. Droege, the biologist. "When people move in, birds, with few exceptions, have to move out."

And so they have.

Plenty of scientific evidence exists to support the gravity of the situation. Much of it comes from records and information gathered nationwide each spring in a massive, volunteer-staffed effort first organized by the US Fish and Wildlife Service in 1965, called the Breeding Bird Survey (BBS).

Using the BBS and other monitoring data, conservationists have placed 35 of 157 North American neotropical migrants on a "watch list" of birds at risk. Another revealing study, looking at high-resolution radar images of the nocturnal clouds of migratory songbirds along the Gulf Coast, showed a 50 percent decline in the size of the flocks during the past two decades.

Some scientists have written of a new "silent spring," a reference to Rachel Carson's famous clarion call for action in the early 1960s against the deadly effect of pesticides. But for the most part, these birds are still present in large numbers, well beyond the levels that would put them on federal lists of threatened or endangered species.

"I have a hard time using the word crisis," says Russell Greenberg, director of the Smithsonian Migratory Bird Center. Instead there is a "persistent, gradual erosion," he explains.

Scientists don't agree on the scale of the problem, partly because data collection has been sketchy. For example, scientists do not know where many of the North American birds go in the winter.

But almost all scientists concur that migratory bird populations are in substantial, and in some cases, drastic decline.

Mr. Evans compares the problem to that of global warming. "We don't have the definitive answer, but we know we have a problem."

CROSS-BORDER CONSERVATION

US and Latin American Groups Join Forces to Protect Birds at Risk

FOR years, biologists of the Vermont Institute of Natural Science (VINS) have been tracking the Bicknell's thrush, a rare songbird that nests in the cool mountain forests of the Northeast US and Maritime Canada. Two winters ago, their search for the wintering grounds of this furtive bird brought them to the Caribbean.

High in the remote Baloruco Mountains of the Dominican Republic, the biologists found what they were looking for – a male thrush that had been banded only six months earlier, on Mt. Mansfield, Vermont, 2,000 miles away.

"It was a pretty amazing establishment of a direct link between the two areas," says Chris Rimmer, director of research at VINS. That discovery has led to another link – between VINS and Dominican birders, biologists, and conservation groups. They are collaborating on field research and on the launch of a broader bird-conservation movement in the Dominican Republic, where forests are rapidly disappearing.

This is only one example of the activities supported by an innovative international coalition called Partners in Flight (PIF). A nonprofit organization backed by federal and private funds, PIF was launched in 1990 in response to evidence of widespread declines in the populations of many migratory bird species.

The premise of PIF was that the traditional approach to conservation – single groups working independently – was not effective. "When you're talking about 350 species moving across two continents, one group can't do it," says Peter Stangel, head of the National Fish and Wildlife Foundation's Neotropical Migratory Bird Conservation Initiative.

PIF seeks to combine the resources of organizations in Latin and North America. It forms partnerships among groups as diverse as the US Army and the Sierra Club, working on international, regional, and local levels to develop bird conservation plans for species that are not yet endangered, but increasingly at risk.

In Mexico and Central America, traditional shade-grown coffee plantations offer a forestlike environment for birds. But over the past 20 years, coffee producers have removed the forest canopy to grow coffee in full sun, boosting yields. Studies by the Smithsonian Migratory Bird Center show a resulting plummet in bird diversity.

With backing from PIF, the Tropical Rainforest Alliance is encouraging the production and marketing of shade-grown coffee, marked with an "ECO-OK" seal. "Just by changing coffee-drinking habits of a few people in North America, we can save migratory songbirds and help people in Latin America save habitat," says Chris Wille, the Costa Rican-based representative for the alliance.

POINT REYES BIRD OBSERVATORY

A BIRD IN THE HAND: *Elvia Soto participates in a program in Panama that helps birds at risk. Partners in Flight is coordinating programs like this one with others in the US.*

THE PIF "Flight Plan" begins with field research to enable scientists to prioritize those species most at risk. This is often done at a grass-roots level, with amateur birders participating in projects to monitor birds.

The next step is to set population and habitat objectives for each species. In the Lower Mississippi Valley, for example, several threatened species – among them the cerulean warbler and Swainson's warbler – depend on bottomland hardwood forests. Under PIF, Champion International, a major paper producer with vast forest holdings in the area, is funding a University of Tennessee research project on the cerulean warbler. "They are looking at where it is and its habitat use so we can fold that into our management of hardwood stands," says Jim Sweeney, wildlife manager for Champion and head of the PIF's corporate committee.

The third step is to develop conservation action plans. In some cases this may mean changing land-management practices in national forests and private lands to take birds into account, such as maintaining riparian corridors or grazing and burning programs that benefit prairie birds.

Another effort is identifying sites on both continents that are important to rare species or large areas that can sustain healthy populations of birds. Though some of these areas are already reserves, "we have to make sure these parks are real and not paper parks," says Roberto Roca, who heads the Migratory Bird Initiative of the Nature Conservancy. The Conservancy's Wings of the Americas program is establishing partnerships between reserves in both hemispheres.

Finally, through events like International Migratory Bird Day, celebrated on the second Saturday in May, PIF is trying to raise awareness of the problem. The American Bird Conservancy and the Audubon Society are also reaching out to some 63 million Americans who watch and feed birds at home to get involved in everything from bird counts to habitat-conservation efforts.

"We have this incredible grass-roots uprising," says Mr. Stangel. "There's never been a more exciting time for bird conservation."

– D.S.

Turning an Ordinary Backyard Into a Bird Sanctuary

PALO ALTO, CALIF.

ABOUT a year and a half ago, I moved into a house on a busy street in the downtown area of this northern California city. The backyard, though graced by an old bay tree, was dirt and concrete, passed up by all but a passing scrub jay.

Under the direction of an architect, we set out to make the backyard into a bird-friendly habitat. We planted berry-growing shrubs like the toyon to attract thrushes, mockingbirds, and others. Hummingbirds were offered a wide variety of flowering plants such as fuchsia and honeysuckle. A sunken pump created a circulating stream of water that flows in nooks and pools over a large boulder. We hung a tubular feeder to provide sunflower seed for the seed-eaters. Finally, we mounted nesting boxes to offer protected breeding for cavity nesters such as titmice and chickadees.

Two springs later, the results are both amazing and gratifying. The garden sings from morning 'til night. Several species of warblers were frequent winter visitors, drawn by the water. Anna's hummingbirds utter their sharp rattle as they give chase from plant to plant, stopping only to bathe. Finches, doves, pine siskins, and many others crowd the feeder. And chickadees and titmice have raised families in our backyard.

Creating even small niches of bird habitat tops the list of recommendations for individual action given by George Fenwick, president of the American Bird Conservancy. He also suggests confining house cats (a major source of predation), drawing blinds or placing decals on windows to prevent bird collisions, and avoiding the use of lawn chemicals.

Mr. Fenwick also urges citizens to join local bird-conservation groups, participating in educational programs and volunteering to help during bird counts; to support a national organization to become informed; and to get involved in leading a local project to preserve a habitat or open space.

A few more suggestions:

- Create a backyard habitat: See "The Bird Garden" and "Concise Birdfeeder Handbook," National Audubon Society.
- Find local bird groups: Contact a local chapter of the National Audubon Society or the American Bird Conservancy (202-467-8348) or the American Birding Association (800-850-2473).
- Use bird-friendly products: Contact the ECO-OK Program (212-677-1900) or Sustainable Harvest (510-652-2100).

– D.S.

MORE INFORMATION

Internet addresses:

- **Partners in Flight –** *www.pwrc.nbs.gov/pif/*
- **National Audubon Society –** *www.audubon.org*
- **All the breeding bird survey data –** *www.mbr.nbs.gov/*

Reference:

- **'Where Have All the Birds Gone?' –** *John Terborgh, Princeton Univ. Press*

Bird Project
Materials List

Included is a list of items that will be needed to successfully complete the bird project

Lab #1

Bird Feet or pictures of birds feet
Pictures of birds
Bird taxonomy resource books
2 sets of encyclopedias
1 electronic encyclopedia
60 -70 bird resource books
White drawing paper

Lab #2

Box of feathers
Metric rulers
Calculators
White drawing paper

Lab #3

Plastic spoons
Plastic Forks
Screws
Small cups
Beak / bill pictures
Popsicle sticks
BB's
Tape

Lab #4

Articles on bird migration
Copies of world and United States maps
Question sheet for article "Requiem for songbird: Perilous Decline Puzzles Scientists"
Student bird reports
Colored pens, pencils, markers
Construction paper
Rulers
Scissors

Student Performance Assessment/ Task

Checklist for Tasks

Student Evaluation		Teacher Evaluation
	A. Understanding The Issue (Understand)	
_____	1. Identify the taxonomy of a chosen bird.	_____
_____	2. Identify the physical characteristics of the bird.	_____
_____	3. Identify the Nesting; Growth; and development of the bird.	_____
_____	4. Identify the habitat.	_____
_____	5. Identify the behavioral characteristics.	_____
_____	6. Lab 1 - Matching Birds Feet	_____
_____	7. Lab 3 - Birds, Beaks, and BB's	_____
	B. Gather; Produce; and Present Information (Do)	
_____	1. Design an appropriate bird house for the bird.	_____
_____	2. Journal observations.	_____
_____	3. Research paper.	_____
_____	4. Oral presentations.	_____
_____	5. Lab 2 - Feather Measurement	_____
_____	6. Lab 4 - Bird Migration and Bird Sanctuaries	_____

Comments on Performance:

Scoring Criteria:

* This scale is a scoring guideline, which will be modified as state-wide implementation progresses:

Key:
- 4 = Performance on this standard achieves and exceeds expectations of high standard work
- 3 = Performance on this standard meets the expectations of high standard work.
- 2 = Work on this standard has been completed, but all or part of the students performance is below high standard level.
- 1 = Work on this standard has been completed, but performance is substantially below high standard level

BIRD PROJECT
BIRD LIST

1 Common Loon
2 American White Pelican
3 Trumpeter Swan
4 Canada Goose
5 Snow Goose
6 Mallard
7 Green-Winged Teal
8 Wood Duck
9 Rose-breasted Grosebeak
10 Red-tailed Hawk
11 Golden Eagle
12 Bald Eagle
13 Osprey
14 Peregrine Falcon
15 American Kestrel
16 Ruffed Grouse
17 Sharp-tailed Grouse
18 Prairie Chicken
19 Bobwhite Quail
20 Ring-necked Pheasant
21 Great Blue Heron
22 American Bittern
23 Whooping Crane
24 Sandhill Crane
25 Killdeer
26 American Woodcock
27 Herring gull
28 Black Tern
29 Mourning Dove
30 Great Horned Owl
31 Barn Owl
32 Snowy Owl
33 Northern Pintail
34 Common Nighthawk
35 Ruby-throated Hummingbird
36 Common Flicker
37 Pileated Woodpecker
38 Barn Swallow
39 Purple Martin
40 Blue Jay
41 American Crow
42 Black-capped Chickadee
43 House Wren
44 Brown Thrasher
47 Eastern Bluebird
48 Yellow-headed Blackbird
49 Red-winged Blackbird
50 Northern Oriole
51 Northern Cardinal

GLOSSARY

This is a *draft* glossary-please feel free to comment to: Gregory_Gough@nbs.gov

abdomen
: Ventral part of the bird. Synonym(s): belly. In picture it is referred to as *belly*.

alula
: Three feathers springing from the base of the primaries. Synonym(s): alular quills.

alular quill coverts
: Feathers overlying the bases of alula. No picture yet.

alular quills
: Three feathers springing from the base of the primaries. Synonym(s): alula. In picture it is referred to as *alula.*

auricular
: Area around ear opening. Synonym(s): ear patch.

axillary
: Ventral area between the body and the wing. Synonym(s): wingpit.

back
: Dorsal part of the bird.

belly
: Ventral part of the bird. Synonym(s): abdomen.

bill
: Beak.

body
: Main mass of the bird as distinguished from its appendages.

breast
: Front part of the chest.

breast band
: Stripe across the breast.

breast spot
: Small, differently colored area on the breast.

cap
: Top of the crown.

cere
: Fleshy area between the beak and face.

cheek
: Area bounded by lore, eye, auricular, and lower mandible.

chest
: Front part of the body.

chin
: Part of the face below the bill.

collar
: Rear portion of crown. Synonym(s): nape, hindneck. In picture it is referred to as *hindneck.*

comb
: Colored area over eye found in males.

commissure
: Base of the bill where the mandibles join. Synonym(s): gape, rictus. In picture it is referred to as *gape.*

crest
: Tuft on the head.

crissum

Feathers covering underside of base of tail. Synonym(s): undertail coverts. In picture it is referred to as *undertail coverts*.

crown
Top of the head.

culmen
Upper ridge on bill.

dihedral
Wings of a flying bird held at an angle appearing to form a "V". No picture yet.

ear patch
Area around ear opening. Synonym(s): auricular. In picture it is referred to as *auricular*.

ears
Rounded, earlike areas on the face. Synonym(s): facial discs. In picture it is referred to as *facial discs*.

eye
Organ of sight.

eye line
Line of feathers in front of and behind the eye.

eye ring
Pale-colored feathers encircling the eye.

eyebrow
Line of feathers above the eye. Synonym(s): supercilium, superciliary line. In picture it is referred to as *supercilium*.

eyelid
Skin-fold covering the eye. No picture yet.

face
Front part of the head.

facial discs
Rounded, earlike areas on the face. Synonym(s): ears.

feet
Terminal part of the leg.

flank
Area between the belly and the wings, more posterior.

flank stripe
Band on the flanks.

flight feathers
Primaries and secondaries.

forehead
Part of the face above the eyes.

foreneck
Front part of the neck. Synonym(s): throat, jugulum, throat patch.

frontal shield
Extension of the bill onto the forehead.

gape
Base of the bill where the mandibles join. Synonym(s): commissure, rictus.

gonys
Lowermost ridge on lower mandible.

greater secondary coverts
Feathers overlying bases of secondaries.

gular region
Between the chin and the foreneck.

head
Upper part of the body.

head stripes
Bold lines on the head.

hindhead
Rear portion of crown. Synonym(s): occiput.

hindneck

Back of the neck. Synonym(s): nape, collar.

horns
Paired contour feathers arising from head.

inner primaries
Group of primaries closest to the body.

inner secondaries
Group of secondaries closest to the body.

inner wing
Shoulder, secondaries and secondary coverts.

iris
Colored part of eye.

jugulum
Front part of the neck. Synonym(s): foreneck, throat, throat patch. In picture it is referred to as *foreneck.*

knee
Joint in the middle part of the leg.

leading edge of wing
Front edge of the wing in flight.

leg
Limb used for supporting the bird.

lesser secondary coverts
Feathers overlying bases of median secondary coverts. Synonym(s): marginal coverts, shoulder.

lore
Area between the eye and the bill.

lower mandible
Lower part of the bill.

lower mandibular tomia
Cutting edges of lower mandible.

malar streak
Area at the sides of the chin. Synonym(s): whisker, moustache. In picture it is referred to as *whisker.*

mandibular ramus
Prong-like, posterior projection from bill. No picture yet.

mantle
Upper surface of the wings and the back.

marginal coverts
Feathers overlying bases of median secondary coverts. Synonym(s): lesser secondary coverts, shoulder. In picture it is referred to as *lesser secondary coverts.*

median line
Stripe through the crown.

median secondary coverts
Feathers overlying bases of greater secondary coverts.

moustache
Area at the sides of the chin. Synonym(s): whisker, malar streak. In picture it is referred to as *whisker*
.

mouth
Cavity bounded by the bill. No picture yet.

nape
Back of the neck. Synonym(s): hindneck, collar. In picture it is referred to as *hindneck.*

nasal canthus
Anterior corner of eye. No picture yet.

nasal fossa
Depression in which nostril is located.

neck
Part connecting the head to the main part of the body.

neck patch
Inflatable sac on neck used by males in courtship display.

nictitating membrane
: Translucent, vertical fold under the eye lid. No picture yet.

nostril
: External naris.

occiput
: Rear portion of crown. Synonym(s): hindhead. In picture it is referred to as *hindhead.*

operculum
: Swollen structure in pigeons overarching the nostril.

outer primaries
: Group of primaries farthest from the body.

outer secondaries
: Group of secondaries farthest from the body.

outer tail feathers
: Part of the tail farthest from the center.

outer wing
: Alula and primaries.

patagial mark
: Dark patch on leading edge of underside of inner wing.

pinnae
: Projecting feathers.

plumes
: Large, conspicuous, showy, feathers.

primaries
: Flight feathers attached to the "hand".

primary coverts
: Feathers protecting and covering the primaries.

primary numbering
: System for assigning a number to each primary.

pupil
: Contractile aperture in iris.

rectrices
: Conspicuous feathers forming posterior margin of tail.

remiges
: See primaries and secondaries.

rictal bristles
: Stiffened feathers near bill.

rictus
: Base of the bill where the mandibles join. Synonym(s): gape, commissure. In picture it is referred to as *gape*.

ruffs
: Fringe of feathers growing on the neck.

rump
: Area between the uppertail coverts and the back.

scapulars
: Area of feathers between the back and the wings.

secondaries
: Flight feathers attached to the "elbow".

secondary coverts
: Feathers protecting and covering the secondaries.

shoulder
: Feathers overlying bases of median secondary coverts. Synonym(s): lesser secondary coverts, marginal coverts. In picture it is referred to as *lesser secondary coverts*.

side
: Area between the belly and the wing.

side of neck
: Area of neck between foreneck and hindneck.

spectacle
: Eye ring and supraloral line together.

speculum
: Highly colored area on secondaries of several ducks.

suborbital ring
: Eyelids. No picture yet.

subterminal band
: Stripe before tip of tail. No picture yet.

superciliary line
: Line of feathers above the eye. Synonym(s): supercilium, eyebrow. In picture it is referred to as *supercilium.*

supercilium
: Line of feathers above the eye. Synonym(s): eyebrow, superciliary line.

supraloral line
: Line of feathers above the lore.

tail
: Feathers extending from the rear of the bird.

tail coverts
: Under and uppertail coverts.

tail numbering
: System for assigning a number to each tail feather.

tarsus
: Part of the leg between the knee and the foot.

temporal canthus
: Posterior corner of eye. No picture yet.

terminal band
: Stripe at tip of tail.

tertiaries
: Feathers adjoining the secondaries.

throat
: Front part of the neck. Synonym(s): foreneck, jugulum, throat patch. In picture it is referred to as *foreneck.*

throat patch
: Front part of the neck. Synonym(s): foreneck, throat, jugulum. In picture it is referred to as *foreneck.*

tibia
: Part of the leg above the knee.

toe
: Digit attached to the feet.

trailing edge of wing
: Rear edge of the wing in flight.

underparts
: Belly, undertail coverts, chest, flanks, and foreneck.

undertail coverts
: Feathers covering underside of base of tail. Synonym(s): crissum.

underwing
: Underside of wing.

upper mandible
: Upper part of the bill.

upper mandibular tomia
: Cutting edges of upper mandible.

upperparts
: Back, rump, hindneck, wings, and crown.

uppertail coverts
: Feathers covering upperside of base of tail.

upperwing
: Upperside of wing.

whisker
: Area at the sides of the chin. Synonym(s): moustache, malar streak.

wing
: Moveable feathered appendage.

wing bars
: Pale tips of greater and median secondary coverts.

wing coverts
: Primary and secondary coverts.

wing lining
: Median, lesser and marginal coverts on underwing.

wing stripe
: Paler area at base of flight feathers.

wingpit
: Ventral area between the body and the wing. Synonym(s): axillary. In picture it is referred to as *axillary*.

wrist
: Area at base of the primaries.