

Field Study Planner

Overview			
Field Study:	The Wonder of Birds	Conceptual Lens:	Systems
Overview:	In this field study, students explore the ways birds interact with their environment and birds' adaptations to maximize their ability to gain energy (food resources). Students investigate the connection between the form and function of bird beaks and feet. In the lab they will develop and test hypotheses about the best beak "form" for feeding on a variety of food substitutions. They identify taxidermy specimens of birds and hypothesize what they eat based on the shape of their beaks. Students then go into the field and make observations of birds. Through a time study, students observe how birds interact with their environment. Students learn to identify birds in the wild, and to determine the age of eagles (in season).		
Grade:	6		
Duration:	2 hours	Season:	Year round (Eagles-winter)

Stage 1 – Desired Results

Big Ideas

Multi-cellular organisms rely on internal systems to survive, reproduce, and interact with their environment (Science 6).

Core Competencies

Communication: Students will use scientific language to exchange ideas with peers.

Thinking: Creative & Critical Thinking: Students will use observation and reasoning to make explanations about form and function of bird physiology.

Social Responsibility: Students will explore human impacts, and how they can reduce negative impacts on birds.

Concepts	Field Study Understandings	Transfer Goals	Essential Questions
Systems Organism Interdependence Survival Adaptation Reproduction Interactions Environment Stewardship	Students will understand that... A living organism is made up of many interdependent body systems that interact to sustain life. -different bird species have different beak types in order for them to access different food resources - bald eagles change in appearance as they age - bird species can be identified by certain physical features - a bird's feeding behaviour can be predicted by the type of beak it has - birds spend their time doing a variety of behaviours - some First Nations legends provide explanations as to why birds look the way they do My actions (both positive and negative) impact the organism's ability to survive.	By the end of the field study, students will be able to independently use their learning to... Observe leading to curiosity Use observation and reasoning to make explanations Use scientific language to exchange ideas with peers Connect to place and understand their role and responsibility as stewards of the environment	Students will keep considering... How is form related to function in bird beaks? What adaptations help a bird survive in its environment? How do birds spend their time? What interactions do you observe -- between birds, and between birds and their environment? Can birds be identified by a variety of features? How do human impact birds and how can negative impacts be mitigated? What is a system? What does it mean to think using a systems approach? How have I experienced 'Systems' at ODS? (e.g. how birds interact with each other and their environment) How am I connected to 'Systems' in my everyday life?

Cheakamus Centre Principles


How does the field study reflect Cheakamus Centre Principles (Place, Community, Inquiry, Personal Connections, and First Peoples' Perspectives)?

Place: Students will explore and make observations of birds in the forest and along the waterways.

Inquiry: Students will explore different habitats for different species and observe bird activities over time.

FPP: Students will use patience and take time to learn about bird behavior.

Personal Connections: Students will discuss the consequences of human actions on birds and how to mitigate those impacts

 Alignment Check:	
Are your concepts, unit understandings, transfer goals, and essential questions connected and supportive of your Big Idea?	
Curricular Competencies	Content
<p>Students will be skilled at...</p> <p>Demonstrate curiosity about a scientific topic or problem (Science 6)</p> <p>Make observations in familiar and unfamiliar contexts</p> <p>Experience and interpret the local environment (Science 6)</p> <p>Identify First Peoples' perspectives and knowledge as sources of information (Science 6)</p> <p>Express and reflect on personal, shared, others' experience of place (Science 6)</p>	<p>Students will know that...</p> <p>Bird beak shapes are adapted to allow them to exploit different food resources.</p> <p>Bird skeletons are specially adapted for their lifestyle.</p> <p>Bald eagles change appearance (plumage, beak & eye colour...) as they age.</p> <p>Birds can be identified by their plumage, shape and size.</p> <p>Human activities impact birds and their behaviour.</p> <p>First Peoples have legends about how certain birds came to be and how birds interact with other animals.</p>

Stage 2 – Evidence: Assessing for Understanding	
Assess: Field Study	
Formative: Checkpoints for students to show their knowledge and skills <u>during the field study</u>	Summative: Final assessments of knowledge and skills <u>at the end of the Field Study</u>
<p>Teachers should consider how formative assessment in outdoor learning is informal, varied, and ongoing throughout the field study.</p> <p>Assessing prior knowledge: "Step into the circle if..." birds. Gather students in a circle and tell them to step into the circle if the statement applies to them, then step back out.</p> <ul style="list-style-type: none"> You can name three species (ask them to define) of birds found in BC You can name three things birds eat You have ever used binoculars You have seen a live eagle <p>Walk & Talk or group discussion:</p> <ol style="list-style-type: none"> What do the terms "form" and "function" mean in relation to animals? Give two or three examples of how form and function in birds or mammals. <p>Matching game of bird beaks and food types</p> <p>Students will demonstrate their knowledge, skills & understanding by:</p> <ul style="list-style-type: none"> -demonstrating proper use of binoculars - recognizing different bird behaviours - working with a partner to use a field guide to identify birds - sharing observations on birds and how those observations aid in identification of species, or age (for bald eagles) - Walk and talk with a partner to share prior knowledge about birds 	<p>Teachers should consider how summative assessments revisit essential questions, involve self-reflection, and builds towards Final Task.</p> <p>Students will be able to demonstrate their understanding by:</p> <ul style="list-style-type: none"> - correctly identifying bird species using a field guide - correctly aging taxidermy eagle specimens - matching bird beak types with types of food eaten - observing taxidermy bird specimens and pair share expected food type based on beak shape - completing a time study sheet after observing a bird's behaviour <p>Walk & Talk or group discussion:</p> <ol style="list-style-type: none"> How do humans impact bird life in a city? (positively and negatively) How do humans impact bird life in rural areas? (positively and negatively) How can humans help birds to survive? What could you do to help birds at home? <p>Owls and Crows game (correctly determining if statements about birds are true or false)</p>

Stage 3 – Executing the Learning Plan

These learning events/activities are suggested activities. Teachers should add, revise, and adapt based on the needs of their students, their own personal preferences for resources, and a variety of instructional techniques.

Introducing the Activity

1. “Step into the circle if”: Gather students in a circle and step into the circle if the statement applies to them, then step back out.
 - You can name three species (ask them to define term) of birds found in B.C..
 - You can name three things birds eat and which birds eat them.
 - You have every used binoculars.
 - You have seen a live eagle (or hummingbird depending on the season)
2. Explain that they will be discovering the amazing world of birds today.
3. Walk towards Fuzzy’s Foot Path. Stop prior to entering and explain the Walk and Talk activity.
 - Q1 – What do the terms “form” and “function” mean in relation to animals?
 - Q2 – Come up with two or three examples of form and function in birds or mammals
 - Discuss with students how the shape “form” of an animal, or part of an animal determines what the animal can do “function” e.g. – giraffes’ long necks allow them to reach leaves that are not available to other animals. Birds have beaks and feet adapted to their life styles and food types
4. Eye Spy- used to learn what field marks in birds are.
 - Put students into pairs, have partners describe each other using hair colour, size, clothing type and colour, eye colour, footwear. Compare these characteristics to how field guides identify birds (colour, size, distinguishing features, ...). Would all features of their partners be the same in different seasons? Note birds change plumage sometimes with the seasons (or with age!).

Forest Lab

1. Prior to entering – Ask students to have a good look at the items set up, particularly as they relate to form and function. PLEASE DO NOT TOUCH the items. Then sit down at table.
2. Everyone seated – Have students try to identify the birds using field guides (think about features you can use to identify them from eye spy game), include where in the forest they live if desired, discuss aging of bald eagles if desired (this is one of the largest gathering places of bald eagles in North America in the winter)
3. Describe what the group will be doing
 - i. using cards, match bird beak with food type and grouping of bird (wading, swimming, perching...); try out different beak simulators to see how they are used to get their food
 - ii. Using manipulatives – try picking up different types of food and see which simulated beak type would work best
 - iii. Review representations of beak types – what was good about the simulations, what did they not simulate?
4. Go outside to observe birds and look for their adaptations (form) that suits what they do (eating, flight, walking...)
 - a. Binoculars – go over rules for use and demonstrate how to focus (use “Binocular Basics” sheet in lab)
 - i. Leave all cases and lens covers on table if possible (some are attached to binoculars)
 - ii. Follow bird map to see what you can find!
 - b. Time Study of birds
 - i. Find a location along your walk with quite a few birds (use the chickens if you need to!)
 - ii. Using the Time Study sheets, each student/pair does a 90s observation of a bird recording what activity it is doing
 - iii. Discuss with a partner what you observed – was the bird’s activity what you expected? What was surprising? Is this representative of what a day might look like? Why or why not?
5. Return to lab – share observations as you walk
6. Leave binoculars on table to dry. Group discussion of observations.
7. Walk and Talk debrief – What did you learn today about form and function that you did not know already? What did you see that you had not observed before?

Forest Lab Birds

Left to Right:

- Great horned owl – raptor – eats meat (has most diverse diet of all North American raptors – mammals, reptiles, birds, insects, ...)
- Barred owl – raptor – eats meat (small mammals, birds, amphibians, reptiles)
- Red breasted sap sucker – woodpecker – eats sap, insects & fruit
- Blue grouse – ground feeder (like a chicken) pecks at ground - eats leaves, conifer needles, small invertebrates
- Male mallard – sieves food out of water, wide bill, strainer – dappler – eats aquatic plants, seeds, aquatic insect larvae, earthworms, shrimp
- Crow (top) and Raven (bottom) – not forehead and how raven beak goes as a shallow angle to head whereas crow has more of a definitive forehead. Raven also has a spade (wedge) shaped tail when flying, crows have squared off tails – eat everything!!
- Belted Kingfisher (male on top, female on bottom) – strong shortish beak for jabbing and grabbing food – eat mostly fish, will eat snails, amphibians, crayfish)
- Male bufflehead – note back of head is going bald from being touched – dive for food – aquatic invertebrates, snails, invertebrate larvae, clams...

Bird Beak types:

Pliers – strong short, for cracking seeds = finch

Tweezers/forceps – more pointed, grippers on inside of forceps, for getting insects; also could be for grabbing slippery fish in the water (grippers) = chickadee, merganser, kingfisher

Chopsticks – long, not too strong, for reaching into water and jabbing at food; ok for grabbing slippery fish if have rough ends (like forceps) - heron– note difference between chopsticks vs tweezers when picking up smartie

Scissors – sharp, tearing; for tearing meat (raptors, birds of prey) = hawk, eagle, owl

Skewer in straw – thin, not strong beak with long tongue = hummingbird

Food types: smarties – seeds, fish eggs, slippery fish (although they are not that slippery really!); licorice – meat; leather bits – worms, insects (millipedes); string – small worms, insects

Characteristics of birds

- Swimming birds (ducks) – spoon-shaped bill for sieving water, nail on end for digging roots; webbed feet for swimming in water
- Wading birds (herons) – long, spear-like bill for jabbing into water for fish, frogs, etc.; long legs with long-toed feet for standing in water;
 - o Shorebirds – short or long bill, possibly curved for different types of probing in sand and mud; longish legs for feeding in, or near, the water
- Birds of Prey – strong, hooked beak for tearing meat; strong feet with sharp talons for gripping prey;
- Chicken-like birds – short, fairly heavy beaks, and strong feet for scratching the ground for food
- Perching birds (warblers) – narrow, needle-like bill for picking up insects; feet with three toes forward and one toe back for perching
 - o Finches – strong, conical beak for cracking seeds; feet with three toes forward and one toe back for perching
- Other small land birds – any birds that do not fit into the above categories!

Extension if time:

Fight of the Feet (Birdquest)

Used to show the special functions of different foot types:

- Try to push water with the fingers of the hand spread and then cupped: cupped hands push more and are better for swimming (compare webbed feet)
- Try to hold on to a stick (cardboard tube, pointer) without wrapping a thumb around it, then with the finger and thumb around it, while someone tries to pull it away; we get a stronger grip when using the thumb (compare to the hind toe of a perching bird)
- Stand on one leg on tiptoe, then flatfoot to show that it is easier to keep your balance when standing flatfoot (compare to the large size of feet in herons that balance while hunting)
- Hold an eraser with your fingertips and have someone try to pull it away from you; then hold it with your fingers curved and nails digging into it, and to the same thing to show that curved fingers and nails give a better grip (compare to the feet of birds of prey)

Supplies: erasers, sticks (cardboard tube)

Battle of the Beaks (BirdQuest)

Use to show the special functions of different beak types.

- Pick up sunflower seed with tweezers (warbler) vs. pliers (finch) – finch beak is better adapted to cracking larger seeds. Both can be used to pick up small insect-like things (string or bits of thread) as birds with both these beak types feed insects to their young

Similarly for other types of beaks:

- Try to break off a piece of licorice using tweezers, then pliers, then scissors (birds of prey)
- Try to pick leather or string out of water using a scoop or a spoon, then a sieve (like the lamellate bill of ducks)
- Try to pick up something slippery (button, jelly bean) with smooth chopsticks, then rough or serrated ones (like merganser's bill, heron bill)
- Probe in an aquarium, or bucket of sand or gravel using tweezers and then chopsticks (to reach different depths) – kingfisher diving for food, heron, American dipper

Revisit the Essential Questions:

Resources:

BirdQuest Beaks Matching sheet

Binoculars – ideally one pair per student

Binocular Basics sheet

Cheakamus Centre Bird Study map

Field guides to birds

Legends: [Keepers of the Earth](#) – How Turtle Flew South for the Winter (p.157)

[People of the Land: Legends of the Four Host First Nations](#) – Smekw'á7 – The Great Blue Heron (p.75)

Squamish Legends: Seagull Raven and the Daylight Box

[How the Robin Got Its Red Breast: A Legend of the Sechelt People](#) – illustrated by Charlie Craigan.

Time Study template

Owls and Crows Activity Instructions

[Beetles: I notice, I wonder, It reminds me of](#)

[Beetles: Walk and Talk](#)

Extension sheet (for back at home school) - [Project Wild](#) – Adaptation Artistry p. 139, p. 85?; Crane Game (US Fish & Wildlife Service)

Teacher: Field Study Reflection

What aspects of the field study went well?

What did students struggle with?

What did you struggle with?

What would you add/revise the next time you taught this field study?

What connections can I make back to my school learning community?

Please see the Extension list with websites.
