Theme: Birds

Objectives:

Big Ideas: Migration, Communication, Adaptations

Enduring Understandings:

- Birds have special adaptations that help them survive, including adaptations to winter in Alaska and migration.
- Birds use their songs to communicate with each other.
- We can learn a lot from birds by learning about and observing their behavior, characteristics, and songs.

Essential Questions:

- What makes a bird a bird?
- What is migration?
- How are birds that don't migrate adapted to winter in Alaska?
- How and why do birds communicate?
- What can we learn from birds?

Learning Sessions and Activities:

Pre-visit (1 hr, at school site)

Objective: Students and instructors introduce themselves and get to know each other. Students find out about the field trip, how to prepare for it, and have a chance to ask questions about it. Students learn about bird migration and adaptations.

Materials:

- Raven and Goose-wife story print-out
- Build a Ptarmigan kit
- Pictures of ptarmigan and/or ptarmigan mounts
Optional: Koosh balls, rubber chicken, or other materials for an icebreaker/name game

**Preparation:** Make sure Build a Ptarmigan kits are fully assembled. Decide what icebreaker or name game you want to play and pack the appropriate materials.

**Procedure:**

I. **Introduction (15 minutes)**
   a. Instructor introduces themselves, the CCSC, and that the kids will be going on a field trip to the CCSC. If any of the students have been to the CCSC before, invite them to share with other students what they remember about it and what they did there.
   b. Instructor and students play an icebreaker/name game (instructor’s choice) to get to know each other. Instructors should do their best to try and learn as many students’ names as possible.

II. **Bird Introduction, Migration Story, and Game (25 minutes)**
   a. Tell students that this fall, we will be learning about birds together. Emphasize that will all be scientists, observing, asking questions about, and learning about our world.
   b. Ask students to share what they already know about birds. What are characteristics of birds that make them different from other animals? Have they seen any birds? What did they look like? What were they doing? Can they name different types of birds?
   c. Ask students if they notice more birds in the summer or winter in Alaska. Try to prompt them to think about birds needing to adapt to survive, for example if they have seen ducks on a pond, where do the ducks go when the pond freezes?
   d. Read story about migration: *Raven and Goose-wife*, an Athabaskan story (see Appendix).
      i. Mention to students that people all over the world have always told stories to help us learn lessons about the world. By listening to stories that are told by people whose ancestors have been in Alaska for a long time, we can learn a lot about the place where we live. These ancestors were the original scientists of
this place, asking questions and wanting to know more about the place where they lived.

e. Discuss migration with students, referencing the story.
   i. Why do birds migrate? (To find food, warmth, etc.)
      Mention that people and other animals migrate too, often for the same reasons.
   ii. When do birds migrate? From our perspective in Alaska they go south in the fall/winter and north in the spring/summer. Based on what time of year it is, discuss what birds might be doing right now.

f. Play short migration game to get kids moving.
   i. Tell students that they are all going to be migrating birds, such as ducks, geese, swans, etc.
   ii. Designate one side of the room to be Alaska and the other side of the room to be a warm southern place in some other part of the world (have students give suggestions).
   iii. Have all the students stand up and start in the Alaska side of the room. Ask them what season it must be if they are all in Alaska (summer). Have students pretend to be gathering food (bugs, water plants, etc.).
   iv. Narrate the change of the seasons. (The days are getting shorter, food is getting scarce.) Tell the birds to start flying south (to the other side of the room).
   v. Repeat and continue to narrate the seasons having the kids run/“fly” from one side of the room to the other.
   vi. At the end, have kids sit back down and ask them how many times they ran back and forth. Then ask them to imagine a bird flying every year between Alaska and Antarctica, as arctic terns do, travelling 24,000 miles per year or more! (It is 12,000 miles one way from Alaska to Antarctica.)

g. Discuss the fact that although many birds migrate, some do not. Then how do they survive the cold and find enough food?

III. Build a Ptarmigan and Adaptation Discussion (15 minutes)
a. Tell students that they were all great migrating birds, but that you are now going to transform one of them into a bird that stays in Alaska through the winter - the willow ptarmigan.
b. Do the Build a Ptarmigan activity. If possible, show pictures or mounts of ptarmigan in different seasons so kids can get a sense of the real bird.
c. Talk about ptarmigan adaptations in relation to human adaptations. Do humans use any of the same strategies to adapt to winter in Alaska? Talk about examples such as feathery down coats, storing food, finding shelter, the fact that we use camouflage to hunt, etc.
d. Tell students that we will learn more about birds on the field trip and that we will go on an adventure to see if we can see any. Tell them that in the meantime, they can start being scientists and noticing birds they might see around their home and school. What are the birds doing? What do they look like? Are their lots of them (flocks) or just a few? Emphasize that scientists are always asking these types of questions to know more about their world.

IV. Goodbyes and Questions (5 minutes)
   a. Wrap up the session by reminding students about the field trip. Talk about what kinds of things they should wear (layers, socks, hats) to be warm going outside.
   b. Answer any more questions students have about the field trip, birds, the CCSC, you, etc.
   c. Close out with a reflection, going around the room (see if you can remember every student’s name!) and having each student say something they are excited for about the field trip.

Fieldtrip (2.5 hr, on-site at CCSC)
   **Objective:** Students become scientists looking for and learning about birds around Campbell Tract. Students learn how and why birds communicate through song. Students explore bird adaptations. Students feel comfortable and excited about going outside.
   **Materials:**
   - Marshmallow roasting sticks
   - Firewood
   - S’more supplies
- Bird story print-out(s) for campfire
- Binoculars
- Bird mounts, bird skulls, and bird-related Riker mounts
- Extra warm socks, hats, and gloves

**Preparation:** Make sure there is enough firewood chopped and start a fire in the firepit before the session. Gather and stage binoculars for hike. Set out bird mounts, Riker mounts, and bird skulls on the classroom counters.

**Procedure:**

I. **Introduction and SPARK (20 minutes)**
   a. Welcome students to the Science Center and gather in the MPR. Briefly go over SPARK, emphasizing preparedness (which we will help them with) and awareness. Tell students that we are all going to be scientists today and use all of our senses to explore and learn about birds.
   b. Have students get prepared to go outside by passing out extra socks, hats, and gloves to anyone who needs them.

II. **Bird Communication Skit (15 minutes)**
   a. Ask students what they remember learning about birds in the pre-visit session. Invite a few students to share what they remember about migration and adaptations. Tell students that we will talk more about those things today too, and that we are first going to learn something else about birds that will help us when we go outside and look for them - we are going to learn how they communicate!
   b. Briefly discuss bird song with students. Have they heard birds making noises before? Do all bird songs sound the same? Have they ever wondered what the birds are saying? Well they are about to find out!
   c. Instructors perform bird communication skit for students (see Appendix).
   d. Briefly review with students the different types of bird calls present in the skit. Discuss how there is a lot we can learn by listening to birds. People can learn bird songs just like they learn other languages (do any of the students speak another language?) and use this language to learn from and communicate with birds. Mention that not only scientists use this skill, but also people that go hunting, and others.
e. Tell students that today while we are exploring outside around the Science Center we will listen for birds and see if we can learn things from their calls.

III. Birding Expedition (45 minutes)
a. Students and instructors go on a hike around Campbell Tract and listen and look for birds. Have students carry and share binoculars and show proper technique for using them. Some activities to do on the hike include:
   i. Stop and have quiet listening times (no talking for 1-2 minutes) to see what you can hear. Have students point to where they heard bird calls. What kind of call do they think the bird was making?
   ii. Practice repeating the sound made by any birds you hear. Can you sound like a raven? A chickadee? Why might you want to know the calls of specific birds?
   iii. Share the story about being able to tell when the sun is going down in the winter by the ravens flying through Campbell Tract on their way from the city to the mountains.
   iv. Look for and discuss any other animal sign you find.

IV. Campfire and Story (40 minutes)
a. Gather students at the fire pit and briefly go over fire respect and safety.

b. Have students make themselves a s’more (enlist chaperone help for supervising marshmallow roasting, passing out graham crackers, etc.).

c. When most students are done roasting marshmallows and are eating their snack, have everyone gather to listen to a story. Tell students that they are now part of an important human tradition of having story time around a campfire - something done at some point by everyone’s ancestors.

d. Read Raven and Owl story (see Appendix).

e. Discuss the story with students and what they think it means. What can we learn from it?

V. Classroom Bird Exploration (20 minutes)
a. Gather students in the classroom and explain that they will have time in here to explore things about birds that live in Alaska.
b. Give a few examples (and ask students for input) of bird adaptations and briefly compare and contrast some adaptations they might explore as they walk around the room (feather color, beak shape, foot shape, etc.).
c. Give students free time to look at and touch the mounts, feathers, Riker boxes, and skulls. Circle around the room and engage with students about what they are exploring.
d. When 3-5 minutes remain in the activity, gather students together for a reflection. Have students go around and share one thing they noticed during the exploration time. Try to prompt kids to describe how what they noticed is an adaptation (how does it help the bird survive, or what does it help the bird do?).

VI. Wrap-up and Reflection (5 minutes)
   a. Gather students and have everyone share one thing they liked and one thing they learned today.
   b. Review some of the things you did and saw. What kind of birds or other animals did you see on your hike? How did students feel about exploring outside?

VII. Closing and Goodbyes (5 minutes)
   a. Gather all students in MPR. Gather borrowed gear, send kids to the bus, tell them you will see them again soon at their school!

Post-visit (1 hr, at school site)

Objective: Students will reflect on what they learned about bird migration, adaptation, and communication in the pre-visit and field trip and apply their knowledge in a creative project.

Materials:
- Cardstock or other heavy paper
- Pencils, colored pencils, crayons, and pencil sharpeners
- Pictures of birds for references (Alaskan and other)

Preparation: Gather materials and sharpen pencils and colored pencils.

Procedure:
I. Fieldtrip Debrief (10 minutes)
   a. Ask students to recount a few favorite memories and learning experiences from the field trip.
II. Design a Bird activity (45 minutes)
a. Tell students that they were such amazing scientists on the field trip that you have a special activity for them today! Describe the following scenario: They are a scientist, observer, and artist who is traveling and working in Alaska when they discover a new species of bird that no one seems to have ever seen before! They ask the local people if they know anything about the bird, but they don’t know either. It appears to be a very rare bird, and very special indeed. Tell students that their assignment will be to draw this new bird that they found! They get to make it up and be as creative as they want. But remember, it lives in Alaska, so they must think about how it is adapted to live here. What does it eat? Does it migrate? Does it stay through the winter?

b. Pass around pictures of birds/references for them to think about as they draw. Emphasize that their bird should be unique though!

c. Give students plenty of time to design and draw their bird. Encourage them to be as detailed as possible. If they finish drawing the bird itself, have them draw its habitat. If they can, have them describe the bird in writing on the back of their paper. Is there a story they can tell about their bird like the story they heard about raven and the goose and raven and owl?

d. Save time at the end of the activity to give kids the chance to share their bird drawings with the rest of the class. Have them describe their bird’s adaptations.

e. For younger students or students who might be having trouble drawing a bird, they can practice looking at what shapes make up a bird. What shape are bird beaks? Feet? Have them look at and describe references.

III. Wrap-up and Goodbyes (5 minutes)

a. Tell students that you enjoyed having them come visit the Science Center and let them know that they can come visit the CCSC and Campbell Tract any time with their family and friends.

b. Say goodbye and tell students you will see them in a couple months when they will get to go on another field trip, learn all about the moon, and build their own rocket ships!
APPENDIX

Migration Story: Raven and Goose-wife
From the archives of the Alaska Native Knowledge Network

Raven and Goose-Wife

It is said that Raven once fell in love with a beautiful young goose girl. They stayed together all summer long, but when fall came and snow was soon to arrive, the goose girl wanted to join her relatives to fly south. Raven decided to go with her because he loved her so much and she would not stay.

Now Raven can fly as good as any other bird, but he cannot fly very far at one time. He tried to keep up with the large flock, but he was always growing tired and had to rest often. When the geese did stop to sleep and eat, they always stopped at places where there was no food for Raven. Because of this, he was becoming weaker every day. The geese were in a hurry to get away from the coming cold and they did not like waiting for Raven all the time. His goose-wife let him ride on her back, but because he was so heavy she couldn't carry him for long. The girl's folks carried Raven for a while, too, but they soon grew tired as well. They took turns like that until they came to the ocean.

The girl's father told Raven that the ocean was very far across and that there would be no place to land and rest. He told him that they could not make it with him on their backs.

Raven thought about this and decided that he would have to stay. He said good-bye to his beloved goose-wife, and then he flew home where he has lived since. Now ravens live here all the time because they can't fly across the ocean like the geese.

Bird Campfire Story: Raven and Owl
From the archives of the Alaska Native Knowledge Network

Raven And Owl

Once Raven was very white like the snow on the tundra and so was Owl. One day, while sitting on a rock looking for rabbits, Raven flew down and landed beside the white owl.

They had known each other for a very long time and were always challenging one another to see which was the strongest. Raven sat down on the rock next to his old friend.
"Let's wrestle," said Raven.

"I do not want to fight you today," answered Owl.

But the white raven did not listen.

"Let's wrestle," he repeated.

"I do not want to wrestle. I do not feel like it today" replied the white owl.

But Raven still would not listen and started to wrestle with the unwilling Owl.

They rolled around the ground and when Owl saw a mud puddle, he pushed Raven into it. The black mud covered his entire body. No white remained at all! Raven was very mad because he was so muddy and because Owl had pushed him in.

"Friend Owl," said the mischievous bird, "give me a hand so that I can get out of this mud hole."

But the white owl was wise to Raven's tricks and deceits.

"No." he said. "You are the one who started the fight. I said that I didn't want to wrestle today."

Raven thought for a minute and then said, "Friend, if you help me out I will give you half of my possessions."

So Owl reached down and pulled Raven out of the thick, black mud. Raven was still covered from head to foot and he was no longer white like the snow.

As soon as he was out, the black bird shook his feathers and mud flew all over the place. Some of it splattered on Owl's white feathers, leaving him spotted with small black specks.

To this day ravens are entirely black and owls are spotted.
Bird Communication Skit

**Cast:** 4 people (3 birds/animals and 1 narrator)

**Sequence:** For the following types of bird calls, first the actors act out the type of call making bird noises, then the narrator asks the audience if they can guess what the birds are sawing, then the actors act out the same thing again but saying equivalent human words, then the narrator explains a little bit about the type of call and what it is called.

**Types of calls (descriptions from Audubon.org):**

- **Alarm call:** Amazingly, birds can tailor their calls to respond to a wide range of threats. If a raptor’s flying overhead, a songbird may make a short, quiet, high-pitched sound that won’t carry far. This alerts nearby birds without revealing the caller’s location. But if a raptor is perched, smaller species might try to project deeply and loudly to rally the troops and mob the intruder. Chickadees, for instance, utter a high seet when they see an aerial predator. If they encounter a perched owl, though, they’ll holler chick-a-dee! with an increasing number of dees depending on the severity of the threat. *Actors act out a bird being stalked by a predator and another bird calling out in warning with increasing urgency.*

- **Begging call:** Youngsters make “feed me” noises, often while simultaneously fluttering their wings to get their parents’ attention. These calls may be regularly repeated and sound pretty darn pathetic. They’re also not the best for getting down to species IDs, but they’ll tip you off to any parent-chick viewing opportunities (always from a safe distance, of course). *Actors act out baby birds calling for food and being fed by their parents. Calls increase in frequency and volume when parent birds are gone.*

- **Contact call:** Birds make contact calls to keep in touch with each other, often while they’re foraging for food. These sounds are usually short, quick, and quiet, though if birds get separated, they may make louder, more urgent “separation calls.” *Actors act out two birds calling back and forth to each other. At one point one bird gets distracted looking for food and the calls of the other bird become increasingly urgent until the food-looking bird returns the calls again.*

- **Flight call:** Species that flock often call back and forth while in flight; this is a good way to detect clouds of blackbirds, waxwings, siskins, or bluebirds passing overhead. Flocks of shorebirds also may be vocal in the air. But many less-social species also have distinctive flight calls that are quite different from their usual calls. During spring and fall, most songbirds migrate at night; if you listen closely, you can hear their various chirps drifting down from the dark sky. *Actors act out birds in flight calling to each other about weather conditions and looking for a good place to land.*

There are other types of bird calls as well, but these are just a few. Birds also have specific songs to attract mates, establish territory, and other things. Sometimes it seems that birds also just sing for fun! We are always learning more about bird song.
NOTES

This lesson plan is to be adapted by the instructor for delivery to 1st through 6th grade students, split into groups of 1st-3rd graders and 4th-6th graders.

Some suggestions for scaling down activities towards a 1st grade level include:

- Focus on parts of a bird when it comes to adaptations. What makes a bird different than other animals? How different birds alike? How are they similar?
- Focus on having students use their senses for exploration during the hike and in other activities. What do they see? What do they hear? What does a bird skull feel like, light or heavy (light because of hollow bones!)?

Some suggestions for scaling up activities towards a 6th grade level include:

- Encourage students to offer their own relevant experiences and knowledge to discussions. What have they noticed about birds? Have they ever had a strange encounter with a bird? What was it doing? Why did it seem strange? Do any of them hunt birds (ptarmigan, ducks, etc.) with their family or friends? What do you have to know about birds to hunt them?
- On the art project, encourage students to be detailed and to write a description of their bird when they are done and/or to write a story featuring their bird and describing how it got a certain feature or why it is a certain way.
For my culturally responsive tool, I chose to write a lesson plan for Fall 2018 for the Campbell Creek Science Center’s partnership with the 21st Century Afterschool Program. We partner with 21st Century to visit kids at their school and have them come on an after school field trip to the Science Center. Historically, the Science Center has done this with 3 participant schools of the 21st Century program, but this year 21st Century secured funding to have 5 schools visit the Science Center for the upcoming 5 years, demonstrating that this is a thriving and growing partnership.

I chose to write my lesson plan for the 21st Century Afterschool Program for a number of reasons. First of all, many of the schools we work with are in some of the more diverse neighborhoods in Anchorage and have students from many backgrounds, including Alaska Native descent. Many of these students visit the Science Center for the first time during the program, and come often with minimal outdoor and science experience. Therefore, this program has the potential to set a precedent for participants’ future interactions with and mindset around outdoor education and science.

Much of the framework and theory for this outdoor science lesson plan came from my reading of *A Yupiaq Worldview: A Pathway to Ecology and Spirit* by Angayuqaq Oscar Kawagley, which contains similar (and elaborated upon) ideas to the article we read by Kawagley at the beginning of this class: *Alaska Native Education: History and Adaptation in the New Millenium*. In *A Yupiaq Worldview*, Kawagley calls on schools and educators to develop science curriculum that combine and harmonize select Western scientific technologies and practices with Native ways of knowing and indigenous science. Kawagley states that “science teaching need not come from the textbooks alone; nor need it espouse the scientific method as the only way to construct knowledge. Rather, what traditionally is understood through myths, collective thinking, experiential learning, intuition, and the ontological presence of mind...should also be included” (Kawagley 103). This influenced my conviction to include myths and experiential learning as an important part of my lesson plan. I also wholeheartedly agree with Kawagley’s assertion in *Alaska Native Education* that “art and science should be taught together,” and believe that breaking down arbitrary barriers between different categories of knowledge can go a long way to reach Kawagley’s goal of making science a “multidisciplinary teaching and learning adventure” where learning science is tied to experiences in and processing of the world around us. For this reason I highlight a creative art project as the wrap-up and reflection activity to the lesson plan.

My lesson plan is specifically about birds, which I chose for their local observational and metaphorical potential as a subject of scientific study. There is a huge turnover rate of students
within the elementary schools served by the 21st Century program, and many students experience moves and uncertainty as a normal part of life. For this reason, I thought it would be grounding to begin the lesson with migration, talking about how many birds migrate and move throughout Alaska, and that these birds are an important part of the ecosystem and community here, even though they might not always be around. Adaptation and migration are two of the big concepts of the lesson plan, and both apply to humans just as well as birds and can provide rich metaphor for discussion.

For the field trip portion of my lesson, I chose to focus on bird communication and on going out into the forest around the Science Center to observe and listen for birds. I emphasize that learning bird song is something that humans have done all over the world for centuries to learn more about their world in real time, and that people who do this can be considered scientists. I also include two local traditional stories about birds in my lesson plan, one in the pre-visit and one around the campfire during the field trip. I chose to include traditional stories because it is a way to value and highlight Native knowledge and bring Native culture and acknowledgement of the ancestors of the land into the lesson, things that are highlighted as important to Native (and other) student success by CHiXapkaid in Views and Perspectives of Native Educational Success. The stories themselves are meant to supplement, reinforce, and expand upon the other lessons that students will be learning throughout the school visits and field trip.

The final post-visit activity where students are to design and describe their own bird is meant to challenge and inspire their idea of themselves as a scientist and artist, as well as give them a chance to express what they have learned creatively with a project they can also take home and share with others. My hope is that it will give students an opportunity to reflect on everything they have learned in the sessions, including larger ideas of change and adaptation, and what that may look like for them. I hope the artmaking time is also an opportunity to have some of those conversations. At culture camp, I found that the conversations that the mind and heart were able to have when the hands were busy with an art/craft task were some of the most amazing ones. There is something about the opportunity and space to be creative that has the potential to spark conversation and foster connection. My hope is that some of those connections will last until instructors see students again in the spring (when the program is repeated with a different theme) as well as beyond.

I hope that my lesson plan itself can guide the creation of future lesson plans for the 21st Century program at the Science Center. I plan to write a lesson plan for the Spring 2019 session using a similar theory and structure. I also plan to orient my co-instructors to the lesson plan and ideas from the ECCI course by giving a workshop in and/or having a discussion about some of the ways we can work to combine indigenous knowledge and science in our work, and what this looks like in our teaching. I also plan to use these same practices and ideas to help edit and update the Campbell Creek Science Center’s other curricula and programs.