

Meet the Trumpeter Swan

Objectives

Student will learn how to identify Trumpeter Swans. They will learn about swan biology and life history traits, and conservation efforts in the Blackfoot and elsewhere.

Method

Students watch a PowerPoint slide show to learn the basics about Trumpeter Swan natural history and conservation. They use a dichotomous key to distinguish between different species of large white waterfowl in Montana. They collaborate in making a life-sized drawing of a swan.

Materials

- Swan Introductory Slideshow (PowerPoint)
- Waterfowl Photo pages (at the end of this lesson)
- Dichotomous Key to White Waterfowl (enough for each student or group)
- Swan-in-a-Grid Sheets (1 to each student).
- 21 sheets of 12 x 12" paper. (Some drawing pads come in this size and can be purchased online or at some art supply stores. You can also buy rolls of 12" wide sketch paper. Large-format paper, such as blank newsprint, can be cut into 12" x 12" sheets, although this can be time-consuming.)
- Pencils and black markers
- Scissors
- Clear tape

Background Information

The Trumpeter Swan is the largest species of native North American waterfowl. There are three species of swans in North America. The Trumpeter Swan (*Cygnus buccinator*) and Tundra Swan (*C. columbianus*) are indigenous, or native,

while the Mute Swan (*Cygnus olor*) is a Eurasian species that has been introduced and now breeds in the wild in some areas. All three are very large all-white birds.

Mute Swans are distinguished by the bright orange bill and distinctive knob on the forehead.

Trumpeters and Tundras are very similar in appearance and can be quite challenging to positively identify. Trumpeters often mix with flocks of Tundra Swans throughout their migration and winter range. Snow geese are also

Grade level: 5-8

Subject Areas: Biology, math, technology, art

Duration: 2 hours (can be one or more sessions)

Topics: Observation and description, natural history, conservation, dichotomous keys, proportions

National/Montana Science Standards: C/3

relatively large, mostly white water birds, although they are less than half the size of trumpeters. Snow Geese have black wingtips. Size can be difficult to determine if they are not seen side-by-side (see chart below).

Trumpeter—the bill is large in proportion to the head, with a straight profile. The head may appear more elongated or even flattened, not so round as in the other species. The eye is not distinct from bill. The bill is black with a red border on lower mandible; the red border may be present on some tundras.

Tundra—the bill is more dish-shaped in profile, and smaller in proportion to the head compared to trumpeter. Head very round; eye usually distinct from bill. Tundra swans have a wide range of head-bill shapes, some having very obvious concave bills, while others appear straighter. Most have a yellow spot of varying size in front of the eye.

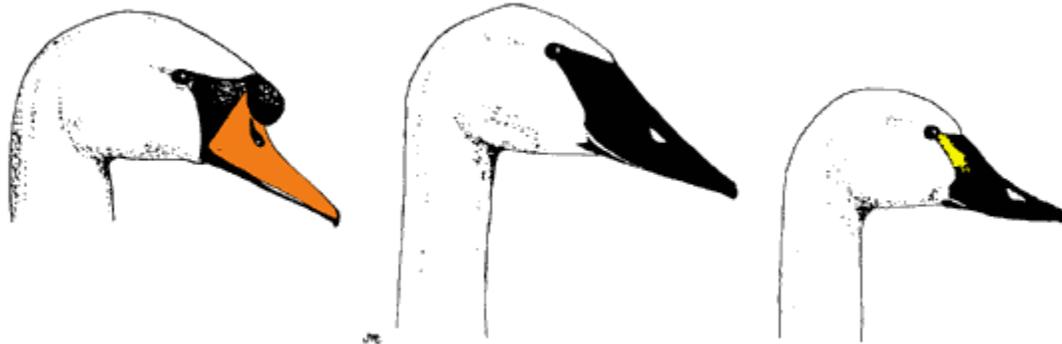
Snow Goose—the total bill length is about 2"; bill is shorter compared to head length than in swans, and does not extend very close to the eyes. The bill is dark pink with a black "grin patch". The neck is about the same length as the head.

Mute—The bill is orange with a prominent black knob at the base.

Mute

Trumpeter

Tundra



Size Information

Species	Wing Span (inches)	Weight (pounds)	Length (inches)
Trumpeter	84-96	21-30	60
Tundra	72-80	13-18	52
Mute	82-94	20-30	57
Snow Goose	36-44	4-6	27

People often use dichotomous keys to correctly identify species of plants, insects, and other organisms. *Dichotomous* means "divided into two parts". In a dichotomous key, the user is given a series of choices between 2 statements about characteristics of the organism. Each choice leads to another pair of statements until the name of the organism is reached.

Although dichotomous keys are not often used to identify birds, they can help students to learn to look for the sometimes subtle differences between similar species.

Procedure

1. Begin by showing your students the Swan Introductory Slide Show. After the powerpoint, discuss the following questions or others you think are important:
 - a. Why did Trumpeter Swans almost become extinct earlier in our nation's history? (Hunted for feathers and skin).
 - b. Where were the few remaining swans in the lower 48 found that were used to restore the population? (The Centennial Valley in MT)
 - c. Who first made a written record of swans in the Blackfoot? (Meriweather Lewis)
 - d. What kind of habitat do Trumpeter Swans need? (Large, shallow wetlands)
 - e. What are some threats to swans today? (Starvation, lead poisoning, shooting, habitat loss, power lines and fences, predation, parasites and disease)
 - f. What other swans live in North America? (Mute and Tundra Swans).
2. Begin by asking students what kinds of clues they use to distinguish one classmate from another. They may mention hair color, size, eye color, gender, etc. Now explain that differences between things can help people identify not just individuals but also what kind or species a plant or animal is. A dichotomous key is a tool that can be used to help people identify species of things. Explain that the students are going to use a dichotomous key to identify Trumpeter Swans and other, similar waterfowl that live in Montana.
3. Hand out the Waterfowl Photo pages and a Dichotomous Key to each student or pair of students. Tell your students that each photo sheet with a letter label has one species of large white waterfowl that can be found in Montana. These species can be hard to tell apart. They should take one photo sheet at a time and use the dichotomous key to identify the species on it. When they think they have figured out which species is on sheet A, for example, they should write that letter next to the species' name at the bottom of the key. Go over with them how to use the key, making sure they start at the beginning each time they use it to identify another species. (An alternative version of this activity would be to have your students create their own key and test it out with other students)
4. Once they have finished, go over their answers together to see if they have all correctly identified each species. Discuss how similar the species are, and let

5. Now tell your students they are going to recreate a life-size Trumpeter Swan using paper and their understanding of proportions and scale. Hand out the Swan-in-a-Grid Sheet and tell them that the grid is 1 inch x 1 inch square. Write the measurements of the Trumpeter Swan on the board and ask how large the grid size would have to be to be life-sized. They should come up with an approximately 12" x 12" grid, to create a swan with a wingspan of almost 8 feet and a length of about 58 inches.
6. Assign each student at least one grid square number and hand out or have them cut 12" x 12" squares of paper, one for each grid number they received. Have them write the number from the small square onto the back of the large square. Tell them they will be responsible for creating a large version of the small grid square they've been assigned.
7. Using **pencil**, students should reproduce the drawing of the swan grid square on their piece of 12" paper. They will need to make sure their lines come all the way to the edge of the paper, so that lines from adjoining squares will meet to make a continuous figure, like the one in the Swan-in-a-Grid Sheet. Have them pay attention to where along the edge of the paper the line enters their square (for example, noting that the line starts about $\frac{1}{4}$ of the way down from the top). This will help their lines meet up with those of the adjoining squares.
8. Students should compare their drawing with their classmates' adjoining squares to make sure of continuity, and make any necessary changes in pencil.
9. Once the drawings are complete, the grid squares can be taped together. Once they are taped together, go over the lines with marker so they show up well. Have student(s) carefully color in the bill, eye and legs with marker, using the Trumpeter Swan photos as a reference.
10. Now you can cut out the swan outline and tape it onto the wall. If you want, you can trace the swan body, neck and head and create a second layer to staple to the outline. You can stuff tissue between these layers to make a 3-D model.

Extensions

- Create a Tundra Swan and/or Snow Goose life-sized drawing the same way, and compare the sizes and shapes of the models.
- Have your students look at unlabeled photos of the white waterfowl species and see if they can correctly identify them.



B



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C



D



Dichotomous Key to White Waterfowl of Montana

1. START HERE FOR EACH BIRD:

- a. I have a white or grey body, neck and head. My head is very round and my bill is shaped like a triangle. My neck and head are about $\frac{1}{2}$ the length of my body. My wingtips are black. My bill and legs are orange or pinkish, and my bill is about the same length as my head. I am: **Snow Goose.**

OR

- b. I have a white body, neck, head, and wings. My neck and head are as long as the rest of my body. My legs and feet are black. If this sounds like me, go to #2.

2.

- a. My bill is orange and black with a black knob on my forehead. I am: **Mute Swan.**

OR

- b. My bill is mostly black. I may have some orange or yellow on my bill. If this sounds like me, go to #3.

3.

- a. My head is very round in shape. My eye is distinct from the black of my bill. The black of my bill is almost straight across the front of my face. My bill has yellow in front of my eyes, either a tiny teardrop mark to a larger spot or stripe. I may have a thin orange stripe on my bill. My bill is slightly concave in shape. I am: **Tundra Swan.**

OR

- b. My head is slightly oval in shape—longer than it is high. My long black bill is very straight, and has a small orange stripe at the bottom. The black at the top of my bill extends around my eyes, and forms a V-shape when you see me from the front. I am: **Trumpeter Swan.**

Write the letter from each bird photo beside the correct name:

- _____ Trumpeter Swan
_____ Tundra Swan
_____ Snow Goose
_____ Mute Swan

