OIMB GK12 CURRICULUM

3rd Grade **45 - 60 minutes**

BIRD ADAPTATIONS - WINGS, BEAKS, AND FEET

Oregon Science Content Standards:
3.1 Structure and Function: Living and non-living things vary in their characteristics and properties.
3.2 Interaction and Change: Living and non-living things interact with energy and forces.
3.2P .1 Describe how forces cause changes in an object's position, motion, and speed.
3.3 Scientific Inquiry: Scientific inquiry is a process used to explore the natural world using evidence from observations and investigations.

Ocean Literacy Principles:
5. The ocean supports a great diversity of life and ecosystems.

Goals: To have students observe the diversity of bird forms and recognize that the structures of bird bodies closely match their functions.

Concepts:

- An adaptation is a feature or behavior that improves an organism's survival.
- Bird wings and feathers are adapted for different types of flight.
- Bird beaks and feet are adapted for different feeding behaviors and prey.

Materials:
- Bird bones and mammal bones (from OIMB)
- Bird wings and feathers from a variety of birds (from OIMB)
- Brock scopes or other microscopes
- Worksheet for drawing bird wing shapes, below
- Photos of birds, below
- Figure of bird feathers: http://www.fernbank.edu/Birding/feathers.htm
- Figure of bird feet adaptations: http://www.fernbank.edu/Birding/bird_feet.htm
- Figure of bird beak adaptations: http://www.fernbank.edu/Birding/bird_beaks.htm
- Additional photos or stuffed birds (from OIMB) to show beaks and feet

Lesson Plan:
1. Begin by explaining that an estuary is a feeding and resting place for many types of birds. Ask the students what types of birds they think one might find in an estuary?
2. Explain that birds, like other animals, have adaptations that allow them to survive. Have students define adaptation.

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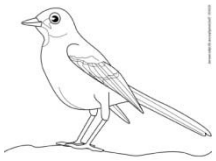
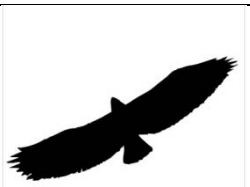
3. Most birds have adaptations to help them fly (except for a few such as penguins):
    a. Hollow bones (show examples of bird bones as well as mammal bones)
    b. Wings and feathers
4. Have students draw bird feathers and label parts. Have them look at bird feathers under a microscope.
    a. Reference page: http://www.fernbank.edu/Birding/feathers.htm
    b. Have students explain what they see under the microscope.
5. Discuss various adaptations of bird wings which help birds hover, soar and takeoff.
    a. Explain that birds have wings of different shapes and that they will observe bird wings from a variety of birds.
    b. Pass out the worksheet showing bird wing adaptations
    c. Have students observe bird wings and sketch their shape, then have them determine how each wing is adapted to a specific type of flight by matching the wing's shape to the worksheet.
        1. Black headed Grosbeak – fast takeoff
        2. Western Gull - long distance oceans
        3. Great Horned Owl - soaring
        4. Northern Goshawk - soaring
        5. Hummingbird – hovering
        6. Red-Necked Phalarope – high speed
    d. Go over the answers and show photos of birds
6. Discuss bird beak adaptations for eating different types of food. Give some examples such as the eagle (sharp beak for catching mice and fish), hummingbird (narrow beak for drinking flower nectar).
    a. Have students research and match up oceanic and coastal birds with what they eat and draw a picture of the shape of the beak.
        1. Pelican – scoops, use bill as a net, primarily eat fish
        2. Cormorant – dive underwater and probe for fish and various invertebrates
        3. Sandpiper – long, slender beaks, probe mudflats for small crustaceans
7. Discuss bird feet adaptations – show examples

Assessment: Have students draw a bird with any type of adaptations that they imagine and define the bird's habitat and food (make sure the feathers, beak, and feet are adapted for living in the specific habitat). The students can share their designs with the class.

GK12 Fellows: Laurel Hiebert, Michelle Schuiteman and Alix LaFerriere.

Bird Wing Adaptations

Bird shape	How it flies	
	**Fast Takeoff**	**Short wing**
	**Soaring**	**Broad wing, spaces between the feathers at the tip**
	**High Speed**	**Flat, long, narrow, swept back**
	**Gliding**	**Long, narrow, flat, pointed, no slots between feathers**
	**Hovering**	**Pointed, small**

Name: _____

How does the bird fly?

Name of bird	Drawing of wing	How does it fly?

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http://www.flickr.com/photos/rick_leche/2513963747/

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http://www.flickr.com/photos/ed_gaillard/4077302852/

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http://www.flickr.com/photos/pfsullivan_1056/4927063464/

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Red-necked Phalarope

http://www.flickr.com/photos/marlinharms/6067930175/

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Northern Goshawk

http://www.flickr.com/photos/liknes/4522341719/lightbox/

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http://www.flickr.com/photos/jasonpaluck/3787447794/