



# Classroom Activity

## Build an Eagle Wing

A Bald Eagle has a wing span, tip to tip, of up to 7 feet (2.2 meters). Yet an average male Bald Eagle weighs about 9 pounds and an average female weighs about 12 pounds. (Try lifting a 10-pound sack of flour or sugar for comparison.) It is the combination of large wings and light weight that makes the eagles masters of the air.

### You Need:

- Pattern on page 29/30
- Crayons, color pencils, or fine tip markers
- Scissors
- Paste or glue
- Two 3/4" brads, also called paper fasteners

### Before Assembling:

Cut page 29 out of this guide. Color all the pieces. With the eagle wing pattern in front of you, read the following information about eagle flight anatomy. You will be told when to cut out the different pieces and how to assemble the wing step-by-step.

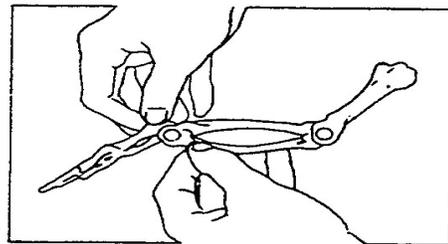
### The Bones

The eagle's body, like that of most birds, is designed to be light.

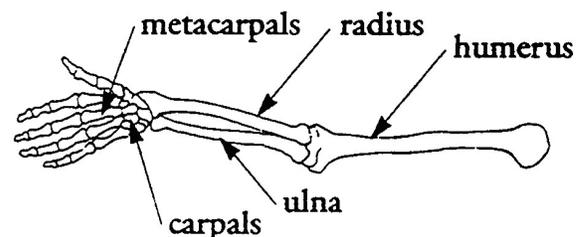
- The whole skeleton weighs less than the feathers!
- Many bones are hollow and porous. They may have struts inside for strength.
- Shoulder, rib, and wing bones are slender. The skull is thin, and there are no heavy teeth to weigh them down.

- Birds breathe oxygen from the air. In addition to lungs, birds have extra air sacs that extend into their hollow bones. Air sacs help with breathing. They keep the body light. Air sacs also serve as a cooling system. Flying can be hot work!

1. Cut out the bones from your eagle wing pattern along the dashed lines. Place area A of the humerus bone over area A of the radius and ulna bones and poke through the Xs with a brad. Place area B of the radius and ulna bones over area B of the carometacarpus and poke through the Xs with a brad.



The brads allow movement like the joints of a real wing. Compare the wing skeleton with the diagram of the human arm below.

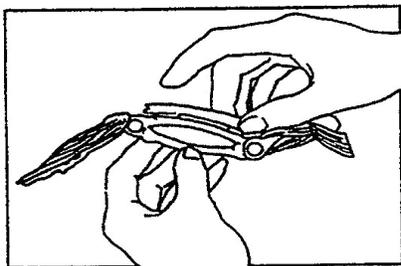




# Classroom Activity

## The Muscles

Breast muscles power the wings. If you could look at them, they would be dark in color. That shows they have a good blood supply, pumped by a strong heart, to bring oxygen to working muscles. Chicken breast (white meat) has poor blood supply. That's why chickens do not set long distance flying records!

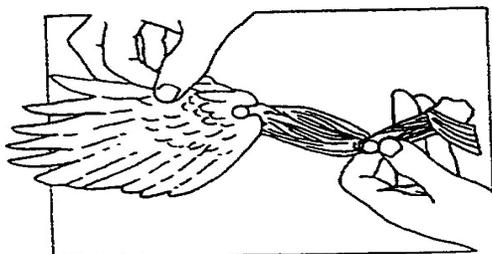


2. Cut out the muscles along the dashed lines. Place the muscles over the bones and fold the tabs to the back, matching the symbols. Paste the tabs so that you can lift the muscles up and still see the bones. Part of the humerus bone will still show.

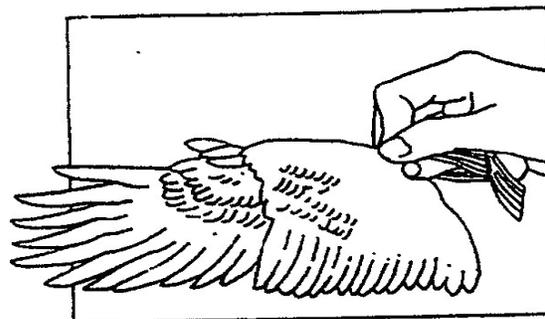
## The Feathers

Feathers are made of keratin like your finger nails. They do not grow evenly all over a bird's body, but grow from special cells in feather tracts. (Look at a plucked chicken. Can you see rows of bumps? These mark the feather tracts.) Each cell grows the right kind of feather for that part of the body.

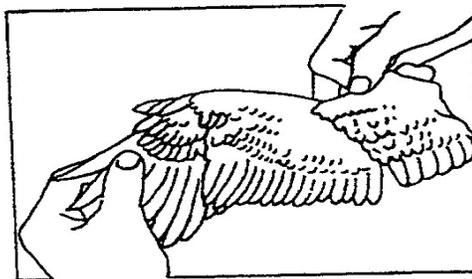
3. Cut out the feathers. Place the wing tip feathers called the primaries over the bones and muscles first. Note how the feathers fit around the brad. Fold the tabs behind and paste.



4. Next, place the secondary wing feathers over the lower arm muscles and bones. The right side will fit around the brad, and the left side should be allowed to overlap the primary feathers and hide the brad. Fold the tabs behind and paste.



5. The last group of feathers closest to-the body are called the tertials. Place them over the humerus bone and muscles. Allow the feathers to the left to cover the brad. The breast muscles and humerus bone will still show on the left side. Fold the tab over to the back and paste.

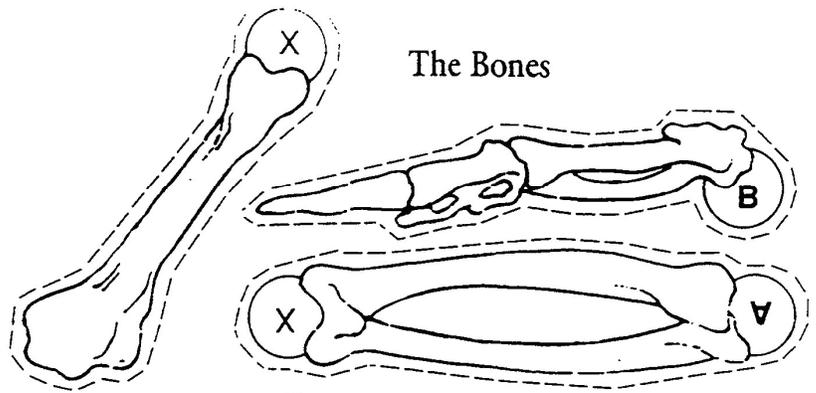


Now the eagle wing is complete. You can lift up the feathers to view the muscles and bones, and the brads allow you to observe how the wing is jointed.

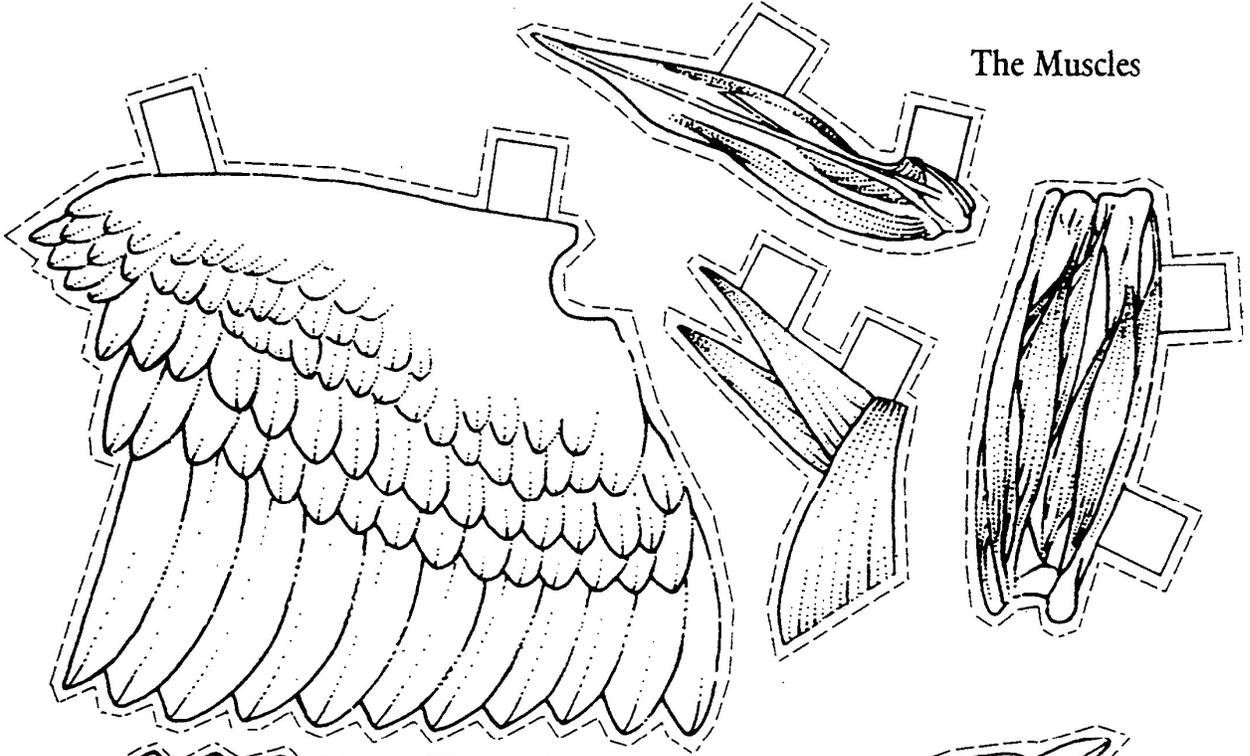
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# Eagle Wing Pattern

Cut out this page, then follow the assembly directions on pages 27 and 28 to build an eagle wing .



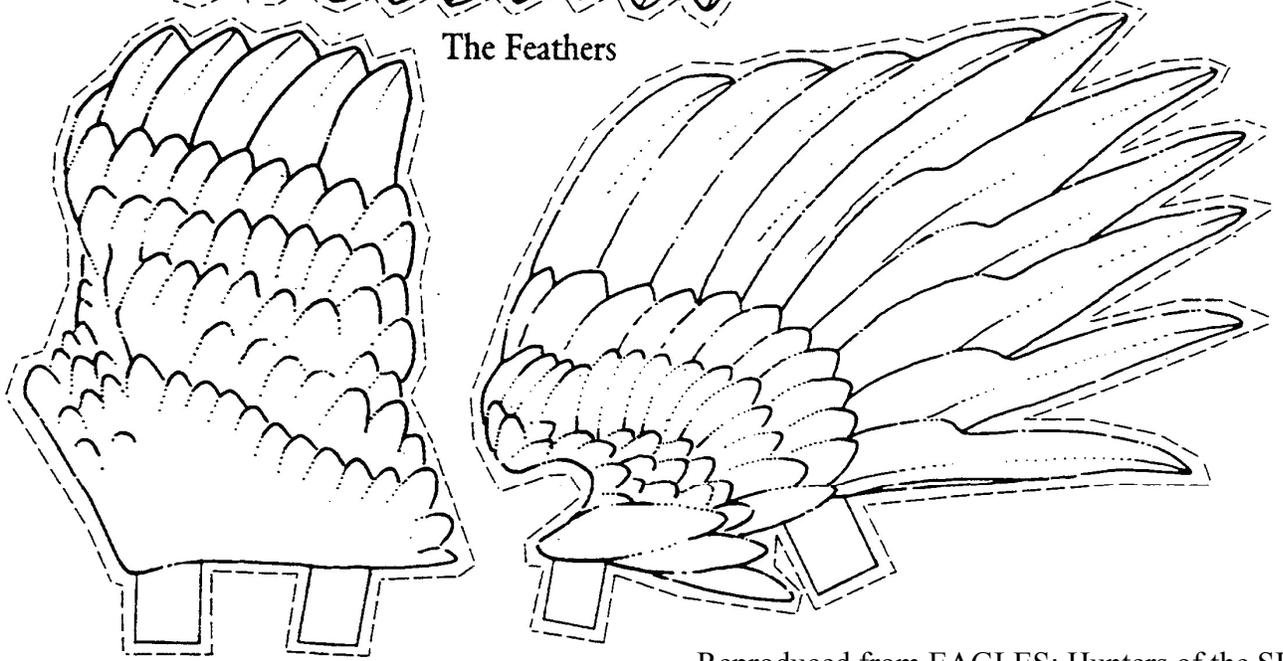
The Bones



The Muscles

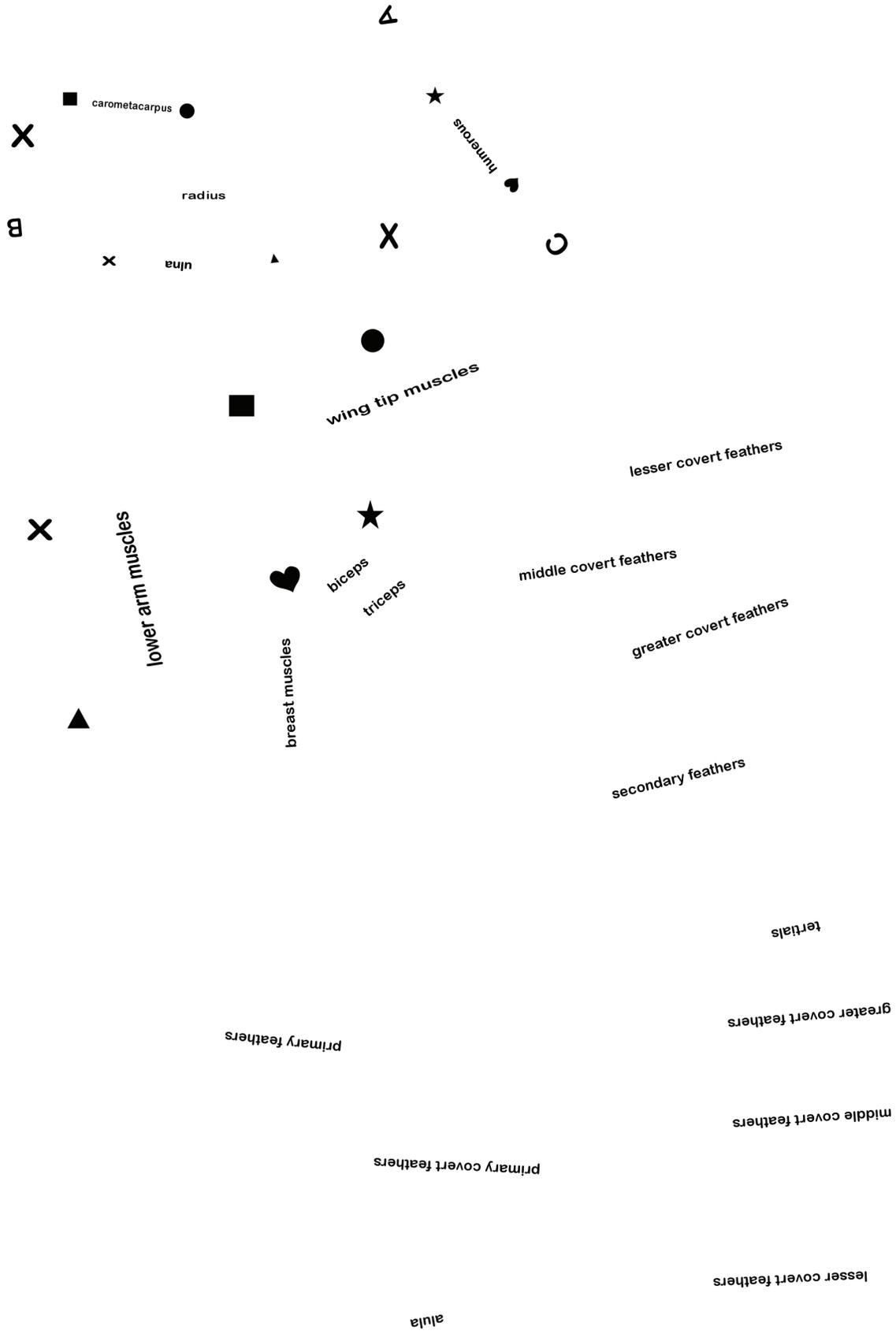


The Feathers



- Cut here to remove page from book -

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\* Match symbols and letters to like symbols and letters