

## 26.3 Birds

### KEY CONCEPT

**Birds have many adaptations for flight.**



## 26.3 Birds

### ▶ Birds evolved from theropod dinosaurs.

- Birds and many theropods share anatomical features.
  - hollow bones
  - fused collarbones that form V-shaped wishbone
  - rearranged muscles in the hips and legs
  - “hands” that have lost their fourth and fifth fingers
  - feathers



### ▶ Two Hypotheses for Avian Evolution

- The “tree-down” hypothesis suggests that birds evolved from animals that used their feathers to glide down to the forest floor.
- The “ground-up” hypothesis suggests that birds evolved from running animals that used their feathered arms for balance.

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- The oldest undisputed fossilized bird is *Archaeopteryx*.

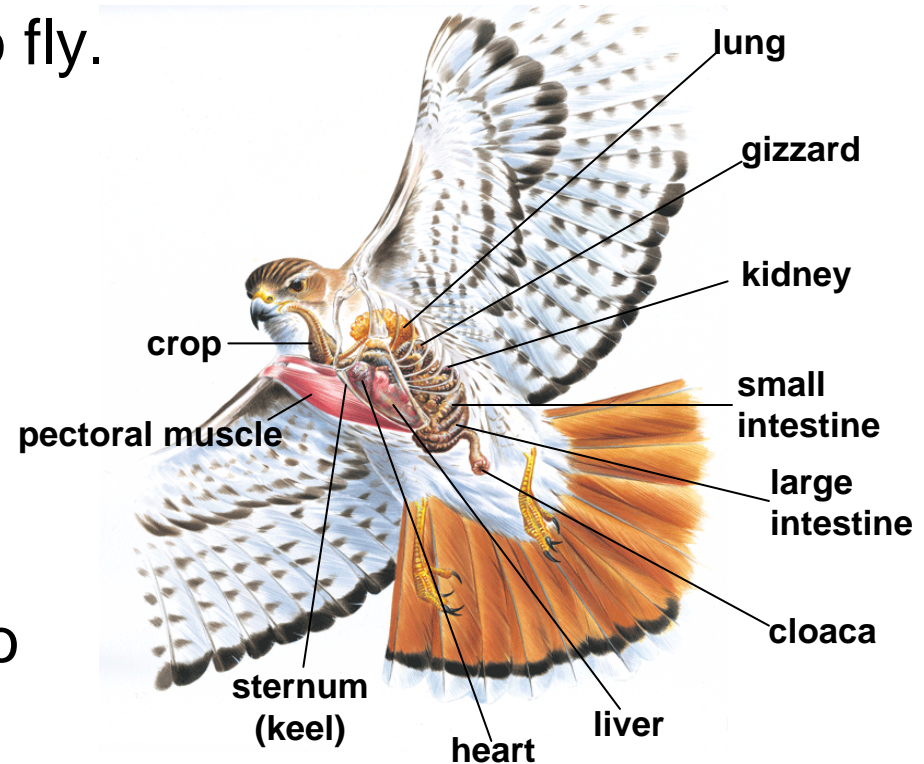




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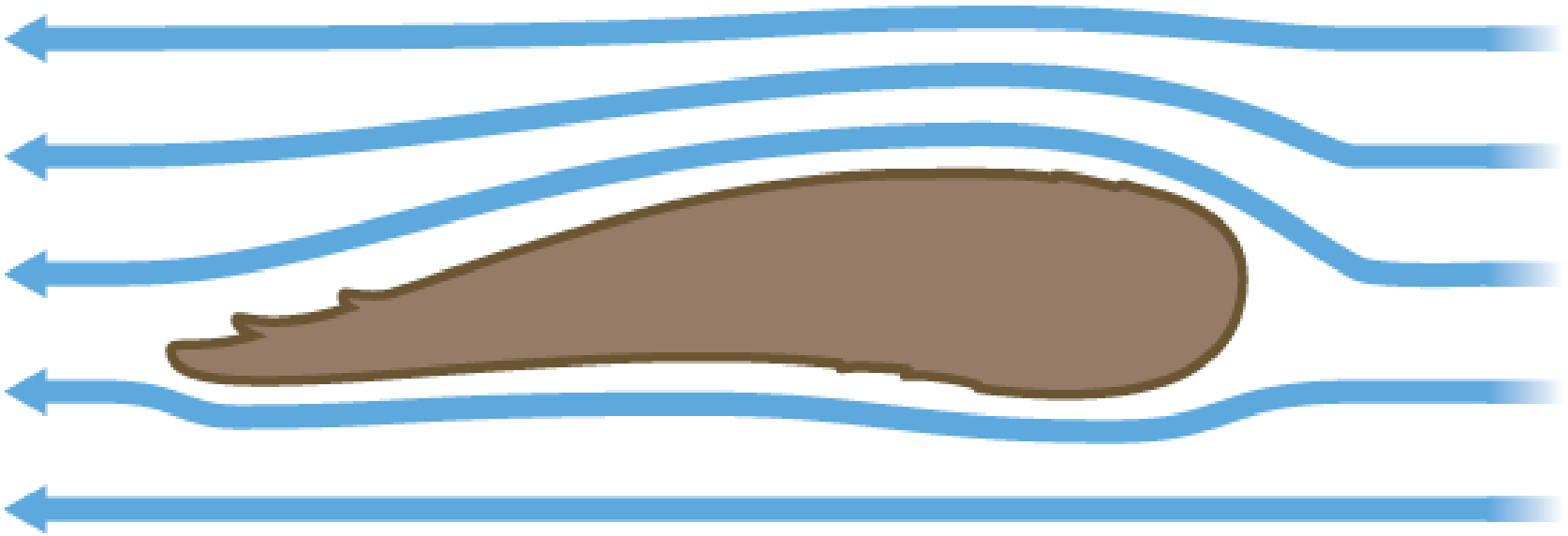
## ▶ A bird's body is specialized for flight.

- Birds have several unique features that allow them to fly.
  - wings to produce flight
  - strong flight muscles to move the wings
  - active metabolism that provides energy to the muscles
  - hollow bone structure to minimize weight
  - gonads active during only part of year



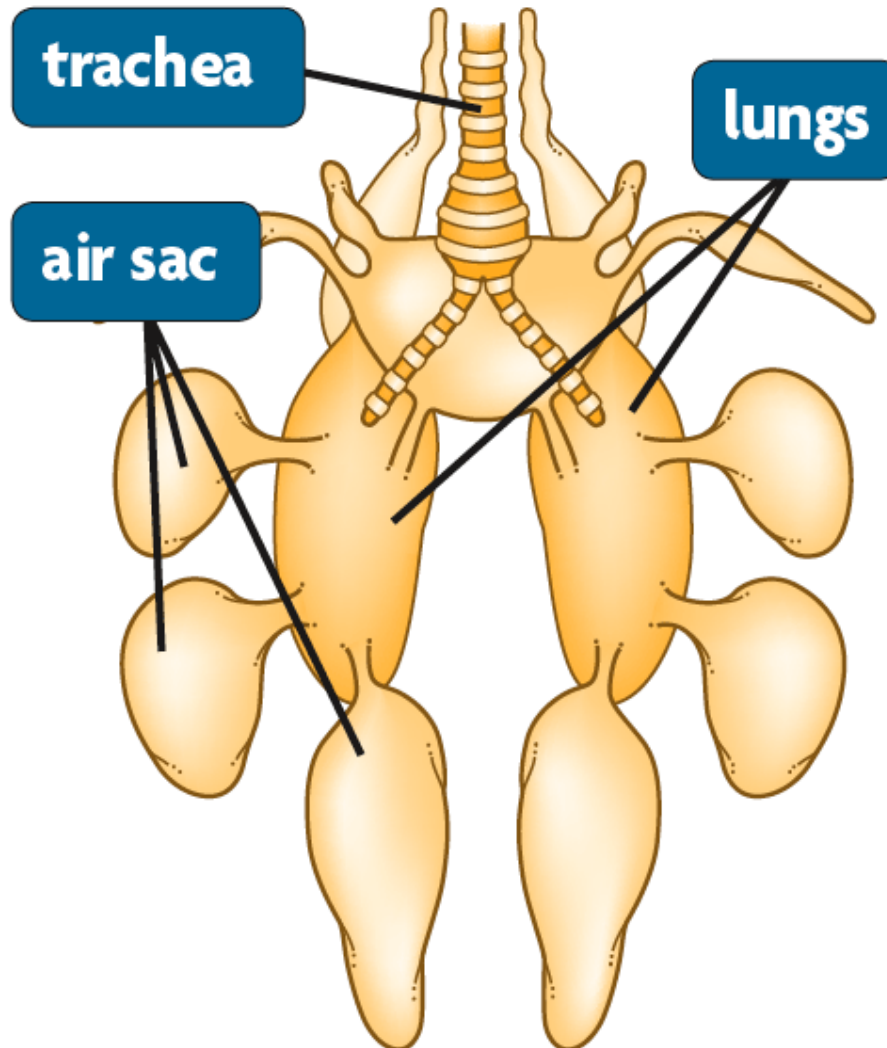
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- Wings are structures that enable birds to fly.
  - airfoil shape
  - covered with feathers



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- Air sacs help a bird meet its oxygen demand during flight.



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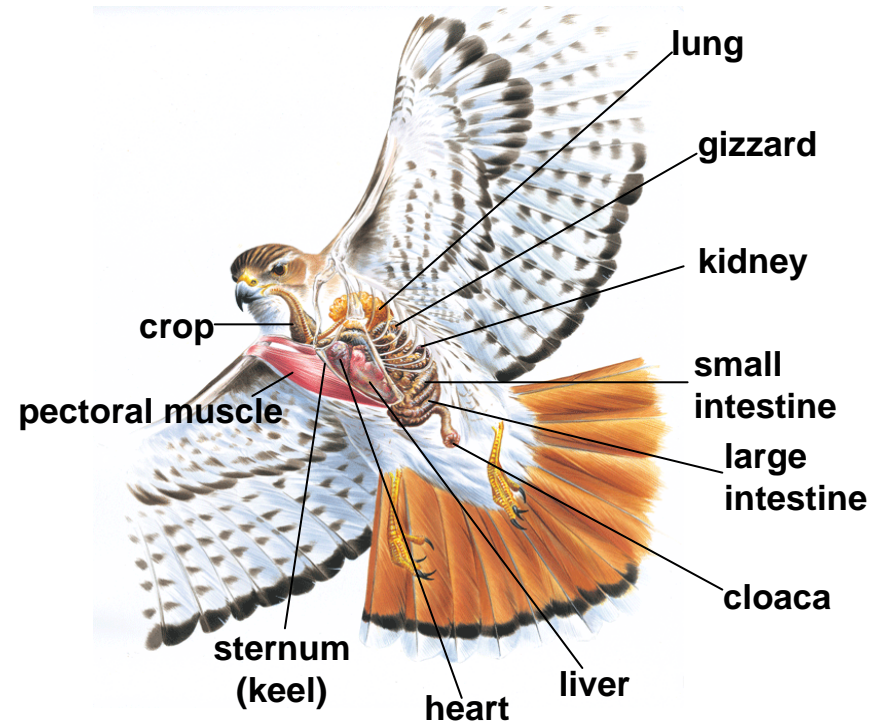
- ▶ **Birds have spread to many ecological niches.**
  - The shape of a bird's wing reflects the way it flies.
    - short and broad
    - long and narrow





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- The shape of a bird's wing reflects the way it flies.
  - wide and broad
  - stout and tapered



## 26.3 Birds

- Differences in the shape of a bird's beak reflects how it eats.
  - spearlike
  - hooked
  - chisel-shaped



blue-footed booby



Bald eagle



green woodpecker

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- Birds show great diversity in their foot shape.
  - webbed
  - heavy claws
  - different toe location



blue-footed booby



bald eagle



green woodpecker