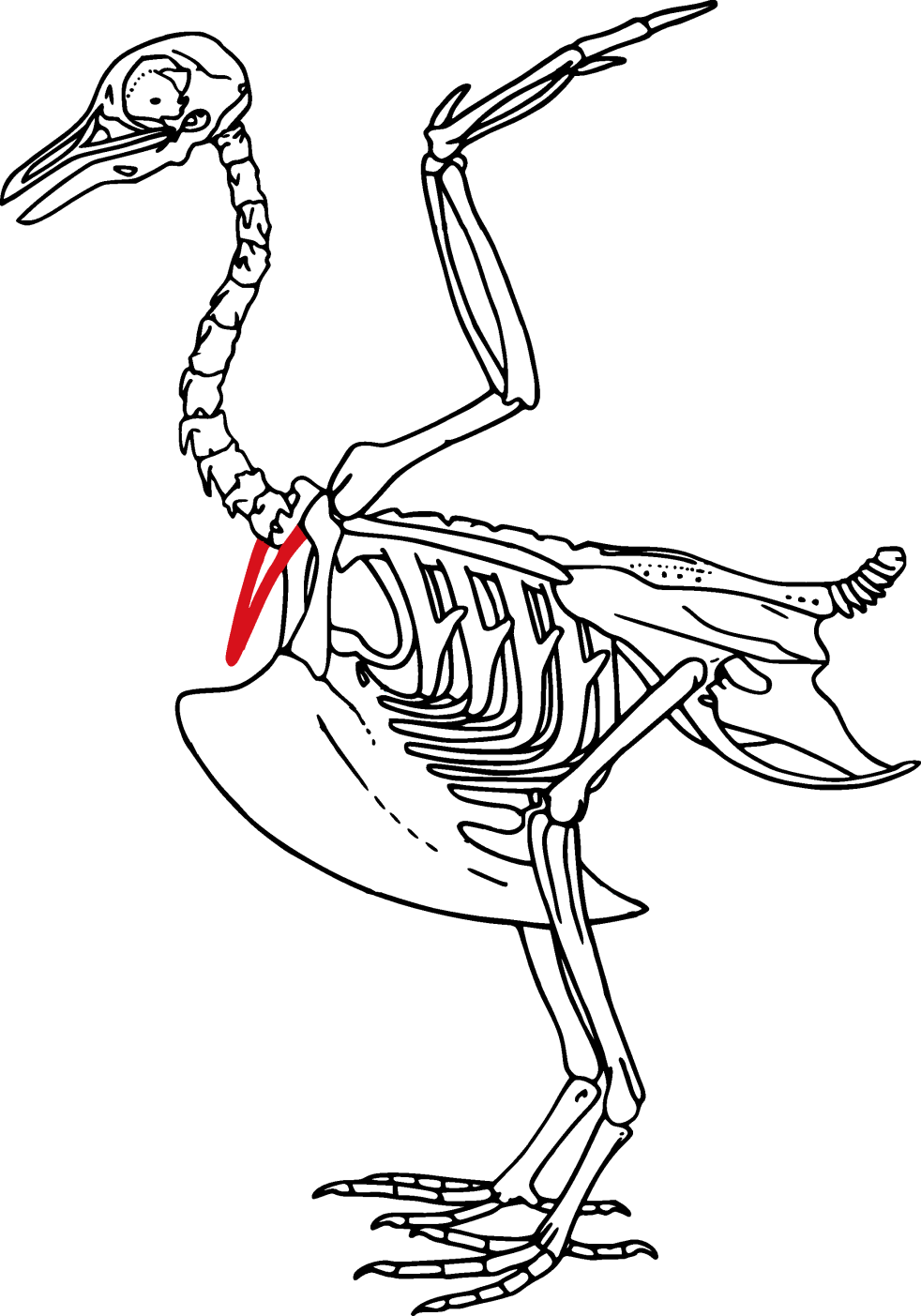
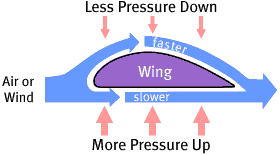
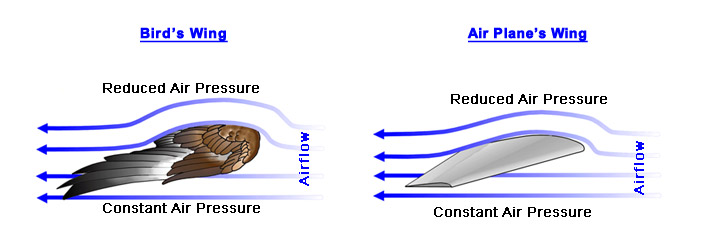
**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Per.:\_\_\_\_\_\_**

**Birds Part 2: Further \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ modifications for \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_:**

* **Furcula** The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to form a structure called the furcula or \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The furcula \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ during \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and spreads and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ during each wing beat. The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ may enhance \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ by assisting in moving \_\_\_\_\_\_\_\_ through the air \_\_\_\_\_\_\_\_\_\_.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Principle - “When the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (air) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, internal \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the fluid \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_”



\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of birds wing = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ The high pressure \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the airfoil will be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than the low pressure \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the wing, causing the bird to “\_\_\_\_\_\_\_\_\_\_\_\_\_” causing the bird to lift up.

Lift and thrust:

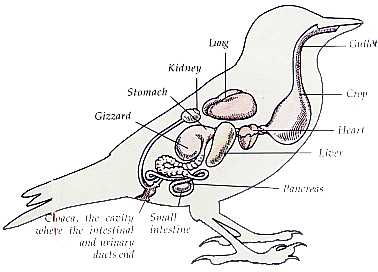
In order to fly both \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are required.

Thrust is mainly generated by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ feathers (the \_\_\_\_\_\_\_\_\_\_\_\_\_ ones at the end of the bird’s hand), which on the down \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, twist and acting like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ push the air \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is mainly generated by the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ feathers (the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ portion of the wing), which form an \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Avian lungs:



* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ - \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_flow of \_\_\_\_\_\_\_\_\_\_\_\_\_\_ is achieved by using a system of air sacs and a \_\_\_\_\_\_\_\_\_\_ breath cycle.
* On \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, air \_\_\_\_\_\_\_\_\_\_\_\_\_\_ down the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to air sacs below the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. On \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the air mass flows into the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ where \_\_\_\_\_\_\_\_\_\_ exchange takes place.
* With a second \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the air mass in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ flows into anterior \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and with a second \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ exits the body via the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Feeding and digestion:

* Because birds lack \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ they can’t process food much in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ so that is left up to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ system.
* Birds can frequently gather food \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than it can be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. This food is usually \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in the bird’s \_\_\_\_\_\_\_\_\_\_\_, an enlarged part of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* The \_\_\_\_\_\_\_\_\_\_\_\_\_ is also used to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ food that will later be \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to chicks.

Stomach:

* A bird’s stomach has \_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_ the anterior \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ proventriculus and the posterior \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Gizzard:

* The gizzard’s main \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ is to mechanically \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ food.
* The \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of the gizzard are thick and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and the gizzard often contains small \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, which the birds \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to assist in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the food. The gizzard thus fulfills the same \_\_\_\_\_\_\_\_\_\_\_\_ as the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in mammals.

Sensory systems: vision:

Most birds have excellent vision and this is reflected in the structure of the brain.

* In contrast, in most birds olfaction is unimportant and the olfactory bulbs are small.

Hearing:

* Birds have hearing that is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ in sensitivity to that of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ even though their \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ are much \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* However, they have proportionally much larger \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ which \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sensitivity to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. In addition, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ has about \_\_\_\_\_\_\_\_\_\_\_ as many hair \_\_\_\_\_\_\_\_\_\_ per unit in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ as a mammalian \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ does.

 Owls possess the most \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ hearing among birds

(comparable to that of a \_\_\_\_\_\_\_\_\_\_ ) and can

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ sounds very accurately even in complete

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Olfaction:

* [](http://images.google.com/url?sa=i&rct=j&q=kiwi+bird&source=images&cd=&cad=rja&docid=eo0k9BUodKE-8M&tbnid=ImXxrIVy3iCJmM:&ved=0CAUQjRw&url=http://www.flickr.com/photos/veryhappyhomemaker/5120593477/&ei=iEMEUYfLFum40QG7zoBQ&bvm=bv.41524429,d.dmQ&psig=AFQjCNE-QHoCe8okl6ie1yyFbrpVlEQgpw&ust=1359320328738109)Most birds have a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ developed sense of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, but a few groups do have a good sense of smell.

Kiwis, the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ birds that are the

national symbol of New Zealand, appear to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

out their earthworm \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

[](http://images.google.com/url?sa=i&rct=j&q=Sooty+Shearwaters+&source=images&cd=&cad=rja&docid=TM03Rj0ZPd16TM&tbnid=Q-JbSdmd6e8p2M:&ved=0CAUQjRw&url=http://www.ozanimals.com/Bird/Sooty-Shearwater/Puffinus/griseus.html&ei=bkYEUfyBOqnF0AGrr4GADQ&bvm=bv.41524429,d.dmQ&psig=AFQjCNGZyoJtMe1cQyUVtAgabfp9Z173Gg&ust=1359321071261343) Sooty Shearwaters and Northern Fulmars are attracted from

downwind to the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of fish oils, squid, and krill.