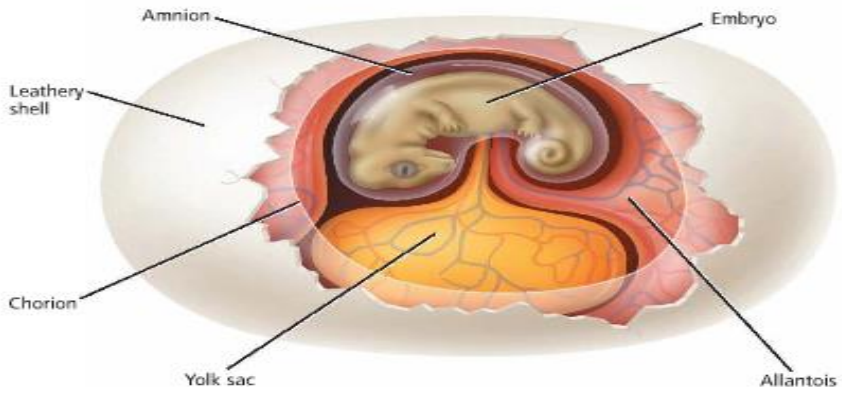
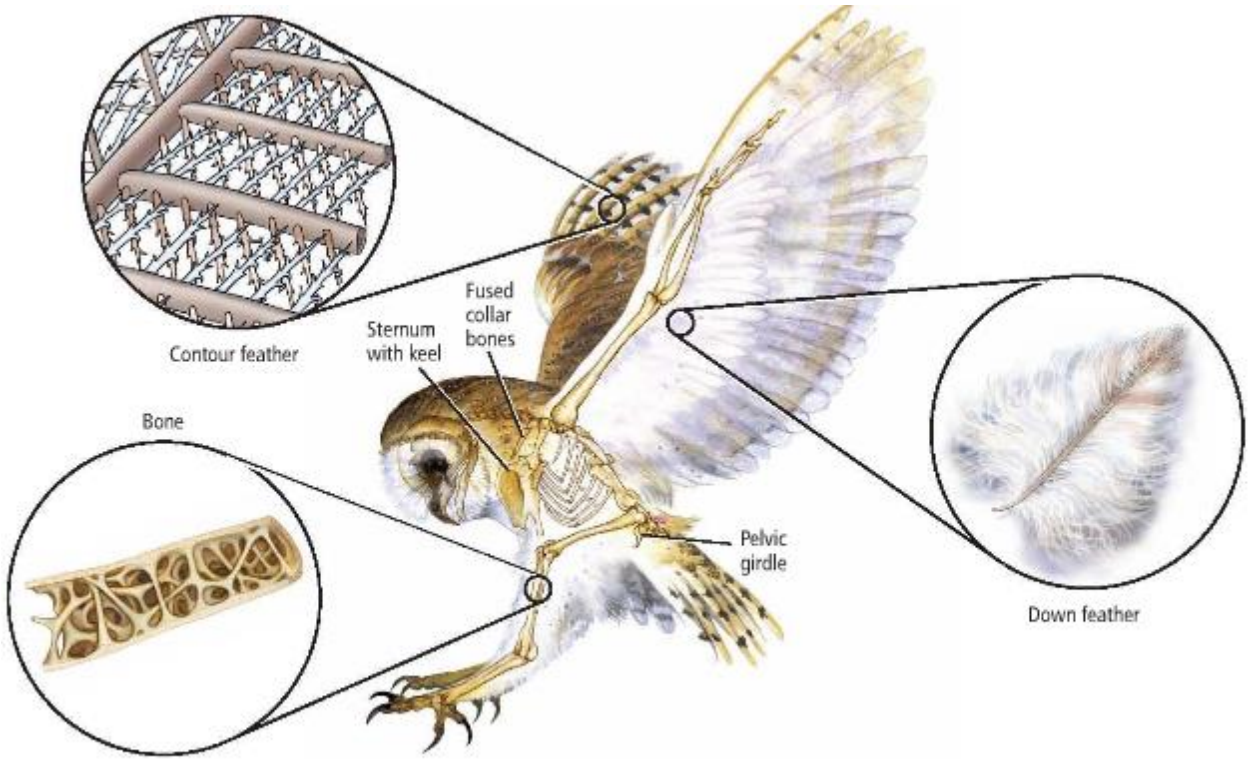
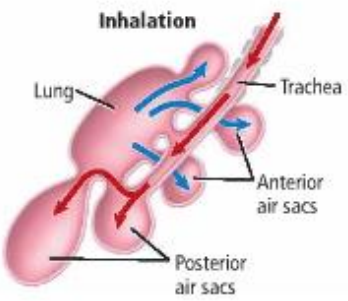
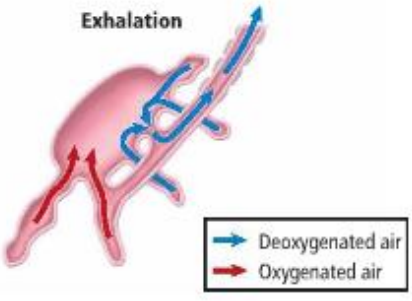
The amniotic egg is protected by a shell and membranes with fluid that help to protect the embryo and keep it from drying out during development.




Birds have contour feathers, down feathers, and lightweight bones.




When a bird breathes, air always flows in a single direction, and highly efficient gas exchange can be achieved.

birds have beaks that are adapted to the type of food they eat.

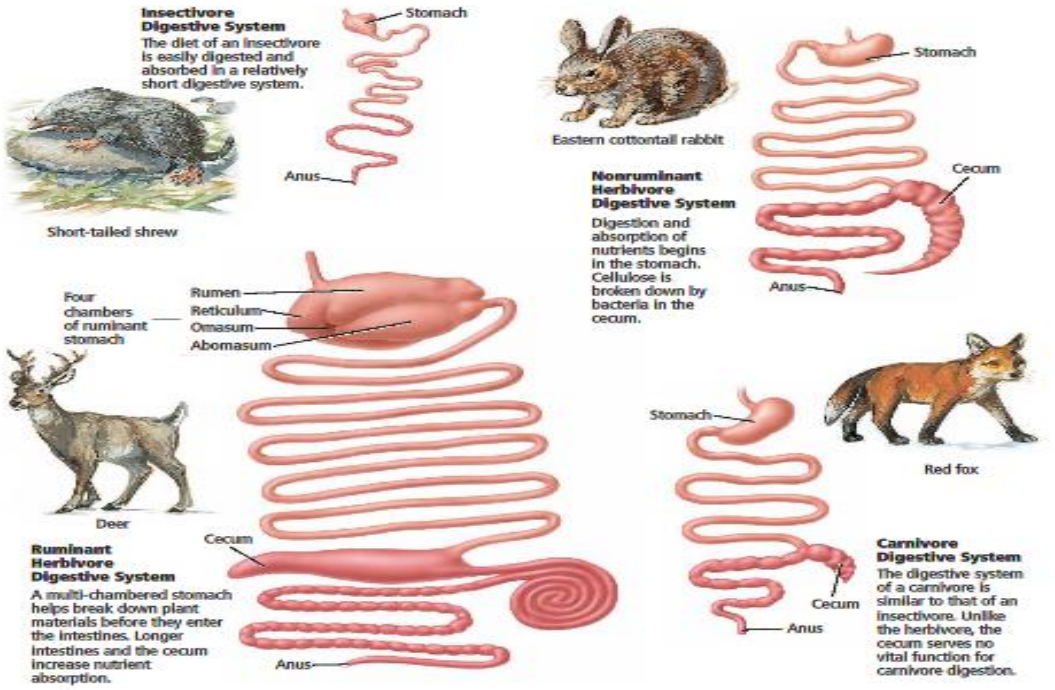
Herons use their long, thin, sharp bills to stab and capture fish and small amphibians as prey.

A pelican uses its beak to scoop fish out of the water.

Hummingbirds have long, thin beaks shaped for drinking nectar from flowers.

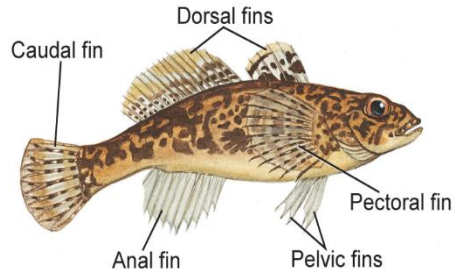
An eagle uses its sharp beak to tear flesh from its prey.

The digestive systems of mammals are adapted to maximize the digestion and absorption of food. The protein consumed by carnivores and insectivores is readily digestible. Plant materials contain cellulose, which resists digestion, water, and some carbohydrates. Compare the structure of each digestive system below.



## Part 1: Fish

Properties of Fish:
vertebrates have jaws, have paired fins, and are covered by scales, breath-using gills, two-chambered hearts (atrium, ventricle)
(vertebral column- Vertebrates: animals with a backbone)
Jaws: for predation or defense
Fin: paddle-shaped structure, used for balance , steering, and propulsion.
Types of scales:
Ctenoid, cycloid-like sardines, placoid like sharks, ganoid
Swim bladder: gas-filled space, like a balloon, found in bony fish that allows fish to control their depth.
Classes of fishes:



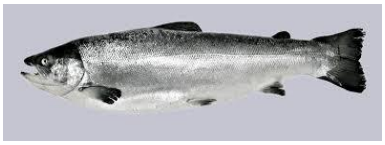

***Jawless***: hagfishes, lampreys

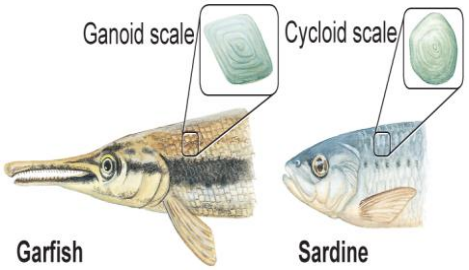


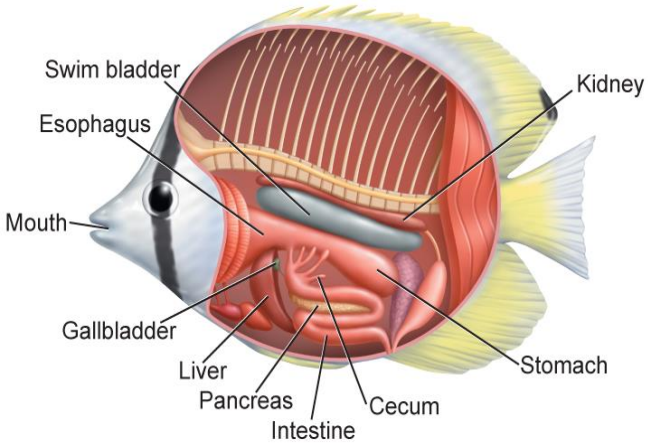
***Cartilaginous:*** sharks, skate



***Bony fishes***: salmon, tuna, greasy grouper




The **lateral line** is a sensory system that allows fishes to detect weak water motions and pressure gradients

**1** **Which adaptation made fish predatory species?**
**CH 5** **A** Jaws **B** Paired fins **C** Swim bladder **D** Scales
Fish have Jaws: for predation or defense. →A

**2** **What types of scales do sardines have?**
**CH 5** **A** Cycloid **B** Ctenoid **C** Placoid **D** Ganoid
Types of scales: Ctenoid, cycloid like sardines, placoid like sharks, ganoid. →A

**3** **Which fish has a swim bladder?**
**CH 5** **A** Shark **B** Greasy grouper **C** Dolphin **D** Seal (seadog)
Swim bladder: gas-filled space, like a balloon, found in bony fish that allows fish to control their depth.
Bony fishes: salmon, tuna, greasy grouper. →B

**4** **Which of the following is parasitic?**
**CH 5** **A** Shark **B** Sardine **C** Lamprey **D** Gar
Lampreys are parasites that feed by attaching themselves to other fishes. →C

**5** **Which of the following is jawless?**
**CH 5** **A** Shark **B** Whiptail stingray **C** Skate **D** Lampreys
Jawless fish: hagfishes, lampreys →D

**6** **Which is not a characteristic of fish?**
**CH 8** **A** Jaws **B** Gills **C** Vertebral columns **D** Open circulatory system
Fish have closed circulatory system →D

**7** **What enables a fish to detect movement in the water?**
**CH 5** **A** Optic system **B** Olfactory system **C** Lateral line system **D** Medulla oblongata
The lateral line is a sensory system that allows fishes to detect weak water motions and pressure gradients →C

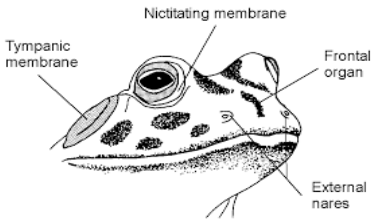
**1** **What is a shark's skeleton composed of?**
**Do It?** **A** Bone **B** Chitin **C** Cartilage **D** Notochord

## Part 2: Amphibian

**Characteristics:**
- Their body temperature changes according to their external environment (ectotherms), four-legged vertebrates, moist skin without scales
- Three chambered heart 2 atria, One ventricle
- Double looped circulatory system
- Adult amphibians breathe through their skin or lungs.
- Their larvae are aquatic and breathe by using gills, herbivores, and tails like a tadpole.

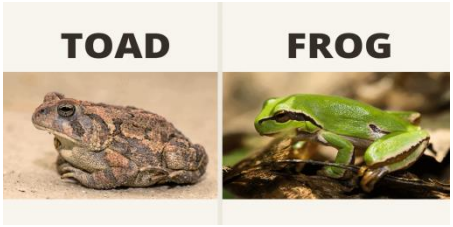
**Cloaca**: a chamber that receives the digestive wastes, urinary waste, and eggs or sperms before they leave the body.
- **Kidneys:** filters cellular wastes
- Excrete either ammonia or urea as the waste product of cellular metabolism.

**Nictitating membrane**: a transparent eyelid moving across the eyes for protection.
- Sexual reproduction, external fertilization.


**Amphibian diversity**

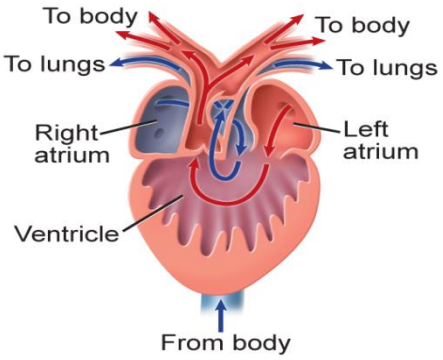
**- Order Anura**




**- Order Caudata**


**- Order Gymnophiona**

Wormlike caecilians, no limbs




**8** **Species that get their body temperature from the external environment are called**

CH 5 **A** Ectotherms **B** Endothermic **C** Euthermic **D** Thermic

Their body temperature changes according to their external environment (ectotherms). →A

**9** **Which of the following is not connected to tadpoles?**

CH 5 **A** Lungs **B** Gills **C** Tail **D** Herbivores

Amphibian larvae are aquatic and breathe by using gills, herbivores, and tails like a tadpole. →A

**10** **Where does urea form?**

CH 5 **A** Liver **B** Kidney **C** Bladder **D** Pancreas

Urea is made in the liver. →A

**11** **Which of the following makes salamanders different than a lizard?**

CH 5 **A** Number of limbs **B** Moist salamander skin **C** Fertilization in salamanders **D** Resistance to change in temperature

Adult Amphibians breathe through the lungs, their thin, ***moist skin***, and cavities in the mouth. →B

**12** **Which of the following is from the order Caudata?**

CH 5 **A** Frog **B** Toad **C** Salamander **D** Caecilians

Order Caudata: Newt, Salamander →C

**13** **Caecilians are different from frogs in that they're?**

CH 5 **A** Endothermic **B** Breath by two lungs **C** Amphibians **D** With no limbs

Wormlike caecilians, no limbs →D

**14** **How many heart chambers does an amphibian have?**

CH 5 **A** One atrium and one ventricle **B** Two atria and one ventricle **C** One atrium and two ventricles **D** Two atria and two ventricles

Three chambered heart two atria, One ventricle →B

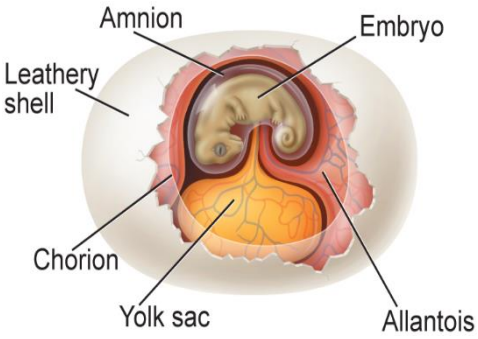
**2** **What part of an amphibian's body does the nictitating membrane cover?**

Do It? **A** Eardrums **B** Eyes **C** Skin **D** Lungs

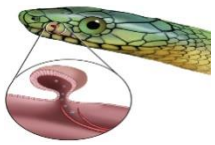
## Part 3: Reptiles

**Characteristics:**
Have dry scaly skin, breath through lungs, double-loop circulatory system, and blood is filtered in the kidney ectotherms (exothermic), which lay amniotic eggs.
**-Heart:** most reptiles have three-chambered hearts except for crocodiles, which have four-chambered hearts.
**- Jacobson's organs** are a pair of saclike structures that senses odors, they are at the top of the snake's mouth.
**Hearing in reptiles:** some have tympanic membranes, while others like snakes detect vibrations through their jawbones.
**Cloaca** enables reptiles to maintain homeostasis by reabsorbing water and minerals.
**Snakes** can keep their eggs inside its body until they hatch.
**Reptiles diversity:**
**- Order squamate**: snakes, lizards
**- Order Crocodilia:** crocodiles, alligators
**- Order Testudinata:** turtles, tortoises
**- Order Sphenodonta:** tuataras
Tuataras have a "third eye" located on the top of their heads that can detect sunlight.

**Amniotic eggs**




**Jacobson's organs**



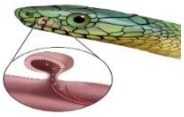
**15** **Crocodiles are similar to lions by?**
CH 5
**A** Ectotherms(exothermic)
**B** Thick skin
**C** Breath through lungs
**D** Same way of reproduction
Reptiles and mammals breathe by lungs. →C

**16** **Which of the following is true about reptiles?**
CH 5
**A** Endothermic
**B** Lay amniotic eggs
**C** Single-loop circulatory system
**D** Four-chambered heart
Reptiles have dry scaly skin, breath through lungs, a double-loop circulatory system, and blood is filtered in the kidney ectotherms (exothermic), which lay amniotic eggs.
-Heart: most reptiles have three-chambered hearts except for crocodiles, which have four-chambered hearts. →B

**17** **Which of the following is exothermic(ectotherm)?**
CH 5
**A** Crocodile **B** Monkey
**C** Cow **D** Camel
Crocodile because it belongs to reptiles →A

**18** **Which of the following has a four-chambered heart?**
CH 5
**A** Turtles **B** Frogs
**C** Fishes **D** Crocodiles
Most reptiles have three-chambered hearts except for crocodiles, which have four-chambered hearts. →D

**19** **Which of the following is the figure shown?**
CH 5
**A** Tongue
**B** Jawbone
**C** Teeth
**D** Jacobson's organs



Jacobson's organs are a pair of saclike structures that senses odors, they are at the top of the snake's mouth. →D

**20** **What does a snake detect with its Jacobson's organs?**
CH 5
**A** Heat **B** Odors
**C** Sounds **D** Visual images
Jacobson's organs are a pair of saclike structures that senses odors, they are at the top of the snake's mouth. →B

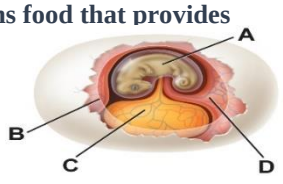
**21** **Which term describes the way reptiles maintain their internal temperature?**
CH 5
**A** Ectothermic **B** Endothermic
**C** Homeothermic **D** Thermodermic
Reptiles are ectotherms (exothermic). →A

**22** **What do snakes use for hearing?**
CH 5
**A** Carapace **B** Jaw bones
**C** Plastron **D** Tympanic membranes
Hearing in reptiles: some have tympanic membranes, while others like snakes detect vibrations through their jawbones. →B

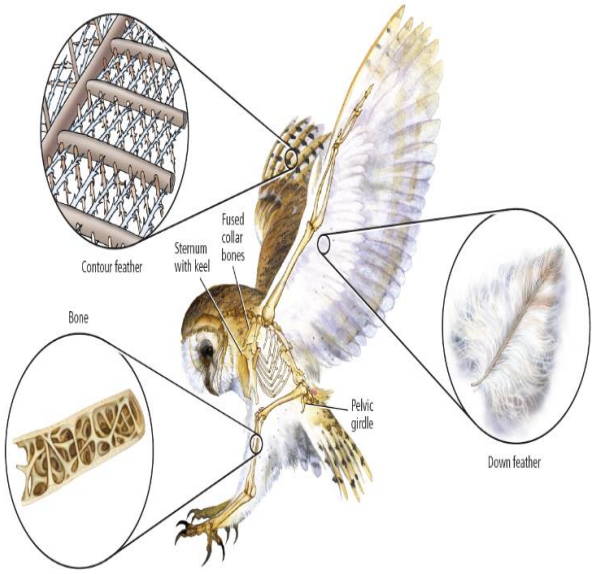
**23** **Which reptile mother can keep its eggs inside its body until they hatch?**
CH 1
**A** Turtle **B** Crocodile **C** Snake **D** Tuatara
Snakes can keep their eggs inside its body until they hatch. →C

**24** **How does the cloaca enable reptiles to maintain homeostasis?**
CH 5
**A** It filters blood to remove waste.
**B** It reabsorbs water and minerals.
**C** It secretes hormones and enzymes.
**D** It improves gas exchange in the lungs.
Cloaca enables reptiles to maintain homeostasis by reabsorbing water and minerals. →B

**3** **Which membrane contains food that provides nutrition to the embryo?**
Do It?
**A** A
**B** B
**C** C
**D** D



## Part 4: Birds




**Characteristics:**

Its body is covered with feathers, light-weight bones, and constant Body temperature, a heart made of four chambers (two arteries that receive blood, two ventricles that pump blood), does not have teeth, does not have a bladder, and contains air sacs that make oxygenated air rush through its lungs. The cerebellum is large because birds need to coordinate movement and balance during flight.

- Feathers are extra parts that grow from the skin of birds and are made mainly of keratin.
- **Types of feathers**:

Vanned feathers cover the exterior of the body, and down feathers are underneath the vanned feathers.

The pennaceous feathers are vanned feathers. Also called contour feathers, pennaceous feathers arise from tracts and cover the entire body.

- Digestive system build (Hummingbirds) Most common shapes of beaks are the shredder (eagles' beak), and the probe.

**Bird levels (Diversity of Birds):**

- Finches: Hummingbirds, like crows
- Penguins: It uses its wings as paddles or flippers to help it swim, Like penguins
- Ostriches: It does not fly, like ostriches
- Swans: Waterbirds, like swans and ducks

The reason causing the extinction of birds is the destruction of their habitats and illegal trading.

**25** **Which of the following animals has a stable body temperature?**

CH 5
**A** Frog **B** Snake
**C** Eagle **D** Turtle

Birds have constant body temperature →C

**26** **Which of the following animals doesn't have a bladder?**

CH 5
**A** Mammals **B** Amphibians **C** Reptiles **D** Birds

Birds do not have a bladder →D

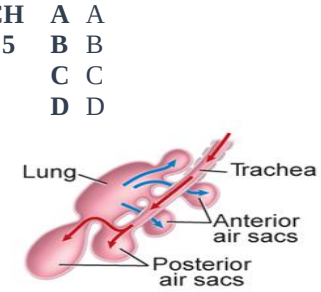
**27** **Which of the following contains a bladder?**

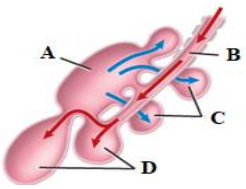
CH 5
**A** Bats **B** Penguins **C** Finches **D** Ostriches

Bats have a bladder because its classified as mammals not birds →A

**28** **The part that refers to the lung in the figure is**

CH 5
**A** A
**B** B
**C** C
**D** D




→A

**29** **Used in the formation of mammals' hair and birds' feathers**

CH 5
**A** Bakhtin **B** Chitin
**C** Keratin **D** Karenin

Feathers are extra parts that grow from the skin of birds and are made mainly of keratin →C

**30** **Which of the following is a characteristic of birds?**

CH 5
**A** Anterior air sacs
**B** Changing temperature
**C** Three-chambered heart
**D** Contains a bladder

Birds contain air sacs that make oxygenated air rush through their lungs. →A

**31** **Which correctly describes a bird's circulatory system?**

CH 5
**A** Two atria and one ventricle
**B** Four chambered heart
**C** Incomplete septum
**D** Single loop system

Birds heart made of four chambers (two arteries that receive blood, two ventricles that pump blood). →B

**32** **Why do birds have a large cerebellum in their brain?**

CH 5
**A** To control behavior
**B** To coordinate visual input
**C** To sense tastes and smells
**D** To carry out complex movement

The cerebellum is large because birds need to coordinate movement and balance during flight. →D

**33** **Which of the following leads to the extinction of some birds**

CH 5
**A** Diseases
**B** Temperature
**C** Destruction of habitats
**D** Rain

The reason causing the extinction of birds is the destruction of their habitats and illegal trading. →C

## Part 5: Mammals

**Special characteristics of Mammals:**
Hair, Mammary glands
**Other characteristics:** Constant body temperature, Teeth, four-chambered heart, have uterus, placenta, and gestation.
**Respiration:** Using lungs and it has a diaphragm
**Hair function:** Insulation, camouflage, sensory device.
**Mammary glands:** Produce and secrete milk that nourishes developing young
**Movement:** Leap as kangaroos, swim as dolphins, fly as bats, run as wolfs
**Reproduction:** Development of the embryo takes place in the female uterus.
**Insectivore:** Easily digested and absorbed in a relatively short digestive system, such as mouse with the long nose (short-tailed shrew).
**No ruminant herbivore:** Bacteria in the cecum, such as rabbits, break down Cellulose
**Ruminant herbivore:** Cellulose is broken down by bacteria in the stomach, such as deer
**Carnivores:** Such as foxes, lions and wolfs
***Animals that eat both plants and animals are called omnivores, such as raccoons***
**Mammals Teeth:** Teeth reveal the life habits of a mammal more than any other physical characteristics


Fox


Cow

**Mammals Classification**
- **Monotremes**: Mammals that reproduce by laying eggs, similar to those of reptiles. Ex: duckbilled platypus and echidna.
- **Marsupials:** pouched mammals that have a very short gestation period. Ex: kangaroos, opossum and macro pods.
- **Placental**: Have a placenta; they give birth to young that do not need further development within a pouch.
Ex: Whales, monkeys, humans, bats, and dolphins
*Placenta*: the organ that provides food and oxygen to and remove wastes from developing young.

**Placental Mammal Orders:**
- Order Carnivora: Cats and seals
- Order Cetacea: Whales and dolphins
- Order Artiodactyla: Dears and cattle's.
- Order Sirenia: Manatees and dugongs
- Order Lagomorpha: Rabbits and pikas
- Order Primates: Monkeys and humans
- Order Perissodactyla: Horses and zebras.
- Order Chiroptera: Bats, their wings a branes supported by modified forelimb.
- Order Xenarthra: Armadillos.
- Order Rodentia: Rats and squirrels

**34** **A special characteristic of mammals is…...** CH 5
**A** Changeable temperature
**B** Respiration through skin
**C** Three-chambered heart
**D** Hair and mammary glands
Special characteristics of Mammals: Hair, Mammary glands. →D

**35** **Faisal dissected some leftovers of an animal that he found in a small island, he noticed that it had a diaphragm muscle, this animal can be……** CH 5
**A** wolf **B** Turtle
**C** Toad **D** Hawk
Mammals using lungs and have a diaphragm. →A

**36** **Which animal has a diaphragm muscle……** CH 5
**A** Deer **B** Crocodile **C** Owl **D** Hawk
Mammals using lungs and have a diaphragm. →A

**37** **What is the special feature that the bats have while other mammals don't?** CH 5
**A** Sharp vision **B** Flying
**C** Feathers **D** Teeth
Bats can fly but other mammals cannot do. →B

**38** **Ruminant herbivores break down cellulose in the…** CH 5
**A** Large intestine **B** Mouth
**C** Small intestine **D** Stomach
Ruminant herbivore: Cellulose is broken down by bacteria in the stomach, such as deer →D

**39** **The mouse with the long nose (short-tailed shrew) is a mammal that eats……** CH 5
**A** Insects
**B** Meat
**C** Plants
**D** Plants and meat
Insectivore: Easily digested and absorbed in a relatively short digestive system, such as mouse with the long nose (short-tailed shrew). →A

**40** **Which figure represents the digestive system for wolfs** CH 5

**A** 

**B** 

**C** 

**D** 

Figure A →A

**41** **Example of an omnivore animal is……**
CH 5 **A** Raccoon **B** Rabbits **C** Lions **D** Deer
Animals that eat both plants and animals are called omnivores, such as raccoons →A

**42** **Which feeding level does this animal belong to ?**
CH 5 **A** Herbivores
**B** Insectivores
**C** Carnivores
**D** Detritivores (saprotrophs)

→A

Fox

Cow

**43** **A person found a skull of an animal similar to this picture, you expect the animal to be…**
CH 5 **A** Horse
**B** Fox
**C** Sheep
**D** Rabbit

→B

Fox

Cow

**44** **Which animal doesn't put its embryo in eggs.**
CH 5 **A** Bat
**B** Echidna
**C** Duck-billed platypus
**D** Penguin
Placental: Have a placenta; they give birth to young that do not need further development within a pouch. Ex: Whales, monkeys, humans, bats, and dolphins →A

**45** **Pouched mammals that have a short gestation period.**
CH 5 **A** Monotreme **B** Secondary **C** Marsupials **D** Placentals
Marsupials: pouched mammals that have a very short gestation period. Ex: kangaroos, opossum and macro pods →C

**46** **Which of the following reproduce by birth?**
CH 5 **A** Penguins
**B** Sharks
**C** Duck-billed platypus
**D** Dolphins
Placental: Have a placenta; they give birth to young that do not need further development within a pouch. Ex: Whales, monkeys, humans, bats, and dolphins →D

**47** **Which of the following is considered a mammal?**
CH 5 **A** Shark **B** Penguin **C** Dolphins **D** Octopus
Placental: Have a placenta; they give birth to young that do not need further development within a pouch. Ex: Whales, monkeys, humans, bats, and dolphins →C

**48** **Bats belong to which class...**
CH 5 **A** Birds **B** Mammals **C** Dolphins **D** Mice
Placental mammals: Have a placenta; they give birth to young that do not need further development within a pouch. Ex: Whales, monkeys, humans, bats, and Dolphins. →B

**49** **Manatees belong to which order.**
CH 5 **A** Proboscidea **B** Sirenia **C** Primates **D** Xenarthra
Order Sirenia: Manatees and dugongs →B

**50** **Which of the following belongs to order Rodentia?**
CH 5 **A** Rabbit **B** Dugongs **C** Squirrels **D** Toad
Order Rodentia: Rats and squirrels →C

**51** **Which of these is a primary function of hair?**
CH 5 **A** Insulation **B** Gestation **C** Excretion **D** Respiration
Hair provides a layer of insulation between the animal's skin and the environment. →A

**52** **Which of these mammals would be expected to have the highest metabolic rate?**
CH 5 **A** Elephant **B** Horse **C** Cheetah **D** Mouse
There is an inverse relationship between metabolic rate and body mass. Thus, the smaller mammal would have the highest metabolic rate. →D

**53** **Which mammal has a ruminant stomach with four chambers?**
CH 5 **A** Wolf **B** Buffalo **C** Rabbit **D** Shrew
Deer, cattle, sheep, and buffalo eat mostly grasses that contain large quantities of cellulose. These mammals have bacteria in their stomachs that break down the cellulose and release nutrients. →B

**54** **Which of these mammals' milk would likely contain the greatest percent of fat?**
CH 5 **A** Monkey **B** Tiger **C** Rabbit **D** Whale
Compared to land mammals, mammals from the sea tend to produce milk with a higher percentage of fat. This fat is necessary to provide energy for producing the layer of blubber that insulates the animal from the water. →D

**4** **In which group of mammals are the young born live and then they immediately move to the mother's pouch to continue development?**
Do It? **A** Marsupial **B** Monotreme **C** placental **D** Primate

Chapter 5: Do It Answer key

| 1 | 2 | 3 | 4 |
|---|---|---|---|
| C | B | C | A |

Fox