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Vertebrates

Vertebrates

Vertebrates are animals **with backbones**. Vertebrates can be classified into either cold blooded or warm blooded.

The cold blooded vertebrates can vary or change their body temperature according to the temperature of the surrounding environment. Examples of cold blooded animals are: fish, Amphibians, reptiles.

The warm **blooded** animals such as birds and mammals, have a constant body temperature irrespective of temperature changes in the environment.

Fish

Example is tilapia



Tilapia

Characteristics

They live permanently in water.

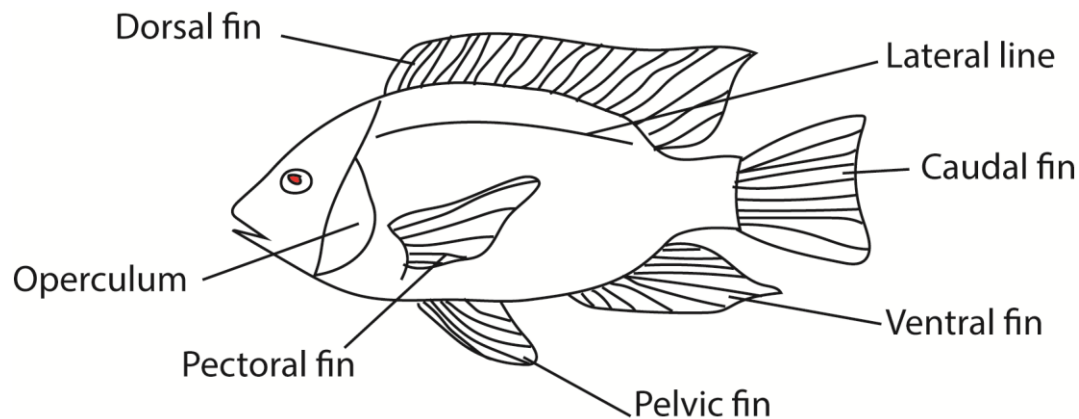
Their bodies are protected with scales or hard skin

They extract oxygen from water using gills.

Their body temperature varies with that of environment, that is, they are cold blooded.

The eggs and sperms are shed in water where they fuse. That is fertilization is external.

A drawing of a tilapia



Functions of parts of fish

1. Operculum protects gills
2. Dorsal fin prevents fish from rolling.
3. lateral lines detect sound waves
4. caudal fin used for propulsion
5. Pectoral, pelvic and ventral fins for balancing.
6. The fish's body is protected with scale.
7. The scales are covered by slippery layer which help

Easy escape from the grip of its enemy

to reduces friction while moving

Class Amphibia

These are amphibians which include Toads, newts, and frogs.



Characteristics

1. they live both on land and in water.
3. They have soft moistened skin with no scales
4. They lay eggs in water and are fertilized externally.
5. they are coldblooded That is, their body temperature varies with environmental temperature.
6. They breathe using gills when they are still young (tadpoles) and lungs when they mature.

Reptiles

Examples are snakes, crocodiles, lizards, turtles, tortoise, python and chameleons.



General characteristics

1. they have a dry skin with horny scales
2. they use lungs for gaseous exchange
4. they are cold blooded
5. they lay eggs with a shell

Note that

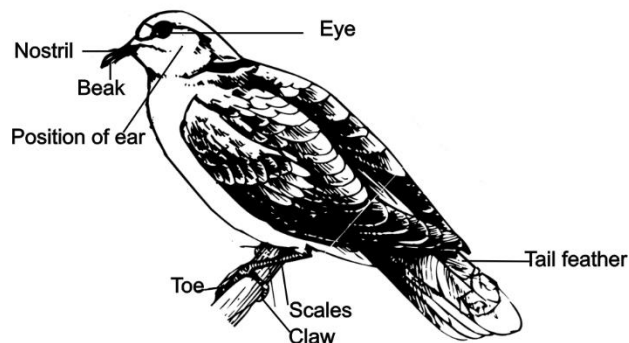
1. Chameleon protects its self by changing color to look like the surrounding not to be noticed by predator
2. Tortoise protects itself by hiding in its shell.
3. Reptiles that live in water include turtles, some snakes and crocodile
4. Land crocodile lizards, tortoises and snakes.

Birds

These are birds e.g cock, hens, ducks, eagles, peacock.

Characteristics of birds

1. Their skin is covered with feathers except legs that are covered with scales.
2. they have skeletons made of hollow bone.
4. have beaks for feeding.
5. they are homiothermic. That is they regulate their body temperatures.
6. they lay eggs with shells
7. they undergo internal fertilization
8. parents take care of the young ones



Feathers

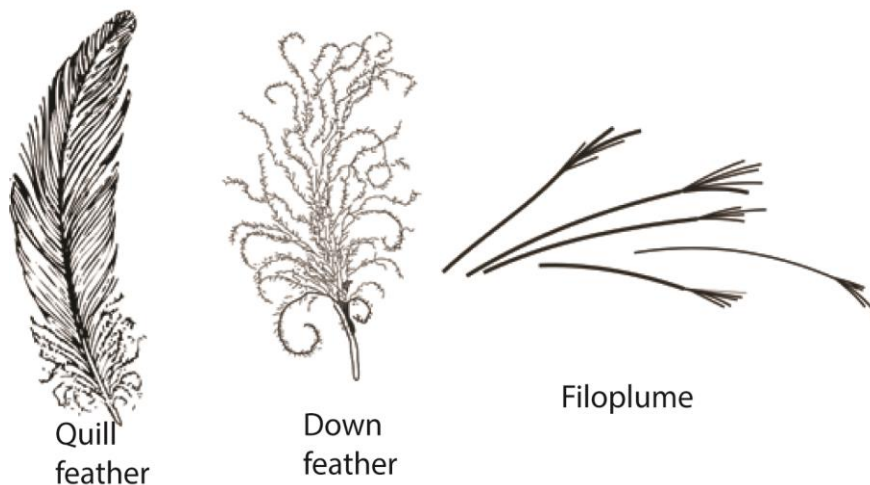
Functions of feathers

1. protect inner part of the body .
2. Keep the body warm and dry
3. some feathers e.g. quill feather is used for flight.

Types of feathers.

- (a) Quill feather: used for flight, protection and warmth.
- (b) Down feather for protection and warmth

Types of feathers



NB: Ostrich, kiwi, penguin are flightless because they lack strong flight muscles.

Bird's beaks

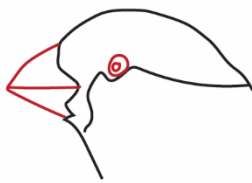
Grain eaters like chicken have short, strong and pointed beaks for picking up grains or **seeds** from the ground.

Filter feeders like ducks have flat and broad beak for sieving or filtering fish, and other water animals from mud

Nectar feeders like sunbird and humming bird have long, thin and slanted beaks to reach through the petals of a flower to suck the nectar.

Flesh eaters like Hawks have strong, short and hooked beak that is used for tearing flesh or meat from the bones of their prey. They feed on animals such as rats and chicks.

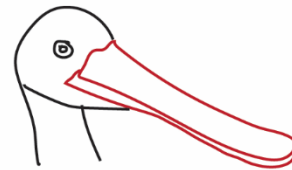
Modification of bird's beaks to feeding



Seed cracker



Nectar eater



filter feeder



Tearing flesh



Insect eater

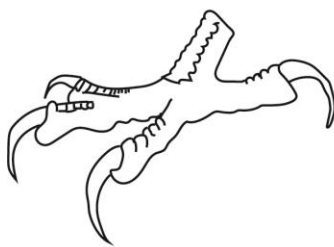


Fishing

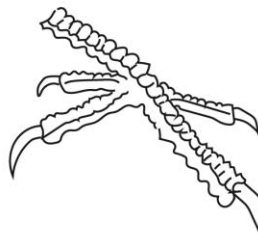
Bird's feet

These are modified according to their use as shown below

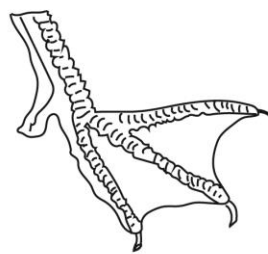
Adaptation of bird's feet



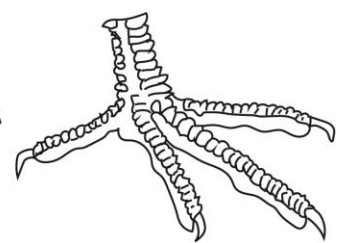
Catching prey
Eagles



Climbing
Woodpecker



Swimming
Duck



Walking
Chicken

Mammals

Examples are cow, man, dogs and cats.

What characteristics do mammals have?

Mammals have the following characteristics:

1. Has specialized teeth
2. Has external ear
3. Has teats leading to mammary glands
4. Body is covered with fur or hair

Others

5. They breathe by the use of lungs
6. Most mammals live on land, though some for example whales, seals and dolphins live in water. These mammals that live in water are called marine mammals.
7. Most have four limbs - some walk on two legs for example man, some walk on four limbs for example cats and cows, some fly using wings for example bats, some hop or leap like the kangaroo, while others swim for example dolphins and whales.

The mammals that have hooves and are called hooved mammals. They include cows and goats. The kangaroo has a pouch on its stomach area which it uses to carry its young one.

8. They reproduce by giving birth to young ones though some primitive ones called **monotremes**, lay eggs which hatch to produce young ones. An example of mammals that lay eggs is the duck-billed platypus.
9. Fertilization is internal

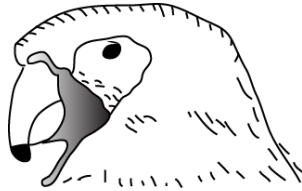
Classification of mammals

Mammals may be classified according to their feeding habits.

- (a) Herbivores feed on plants only e.g. cow, goat, sheep
- (b) Carnivores feed on animal flesh only, examples, lion, leopard
- (c) Omnivores feed on both plants and animals, examples, man, pig

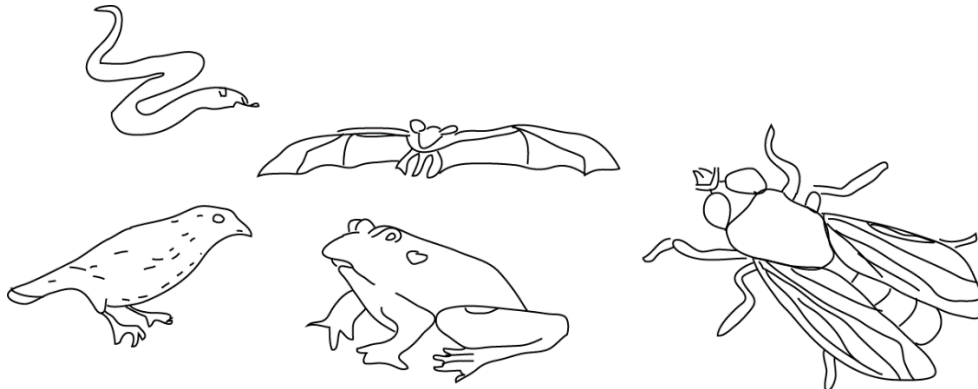
Revision questions and answer

1. The diagram below shows the beak of a bird. Why do you think a bird with this kind of beak is a meat eater?



It has strong pointed and hooked mouth tearing flesh.

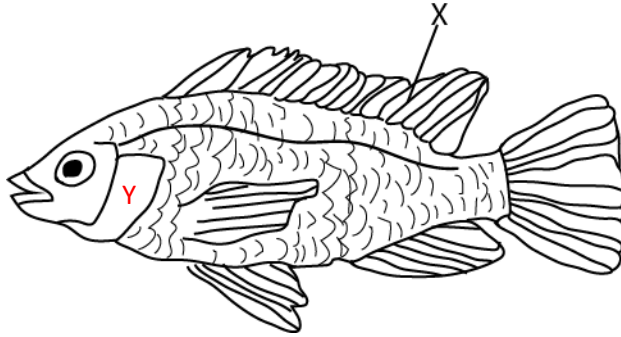
Use the drawing below to answer questions 4 to 6



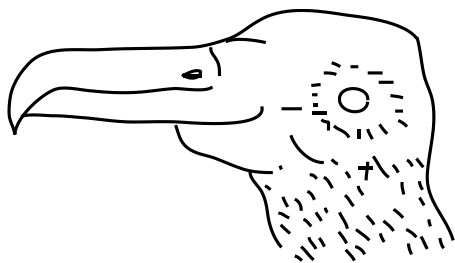
2. Which animal lay eggs?
Snake, bird, frog and housefly
3. Which of these animals are cold blooded?
Snake, frog, house fly
4. Which of these animals has no back bone?
Housefly
5. Which these animals can fly?
Bat, bird and housefly
6. Which of these animals is a mammal?
Bat
7. Why would an egg from a layer not hatch into a chick after it has incubated for 21 days?
When the egg is not fertilized
When the egg lacks a yolk
When the egg was damaged

8. The chameleon is a slow-moving animal. State one way by which it protects itself.
It changes color to match with environment not to be seen easily

9. The diagram below is of a fish. Study it and answer the questions that follow.



- (a) Name the part labelled X
Dorsal fin
- (b) Mark with Y the position of the gills
- (c) How does the fish take in oxygen?
Swallow water with oxygen, this passes over the gills where gaseous exchange takes place
10. A female fish lay eggs in water. How are these eggs fertilized?
They are fertilized externally by sperms of male fish
11. (a) State one way in which you can distinguish between a poisonous snake and a nonpoisonous one
Poisonous snakes has fangs while nonpoisonous snake does not have fangs
- (b) Give an example of a poisonous snake.
Cobra
Puff adder
Black mamba
- (c) What First Aid is given to a person bitten by a poisonous snake?
Put a black stone to absorb poison
12. State a mammal which lives in both land and water in Uganda.
Hippopotamus
- Use the picture of an animal below to answer question 13 and 14



13. What does the animal shown in the picture above feed on?

Flesh

14. Why do you think the animal above is important in our community?

Get ride off dead bodies from the environment

15. (a) State one reason why a frog is able to live both on land and water comfortably.

In water it breathes through the skin, on land through the lungs

(b) To which group of animals does it belong?

Amphibians

(c) What helps a frog to swim easily?

It has webbed feet

How does it protect its eggs?

It spreads spawn jelly around the eggs

16. Use the animals below to answer questions that follow.

Mouse, chameleon, frog, python

(a) Which two animals can be grouped together?

Chameleon and python

(b) Give a reason for your answer in (a) above.

They are reptiles

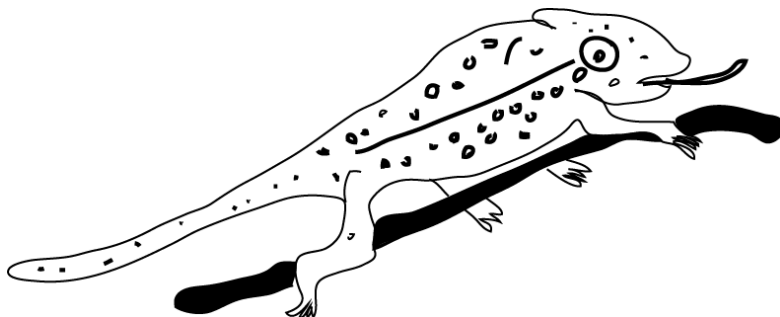
(c) Which animal has a different form of reproduction from others?

Mouse gives birth to young ones the rest lay eggs

(d) In which environment do you find the frog?

Wet and cold environment

The diagram below shows an animal commonly found in the school surroundings. Use it to answer questions 17 and 18



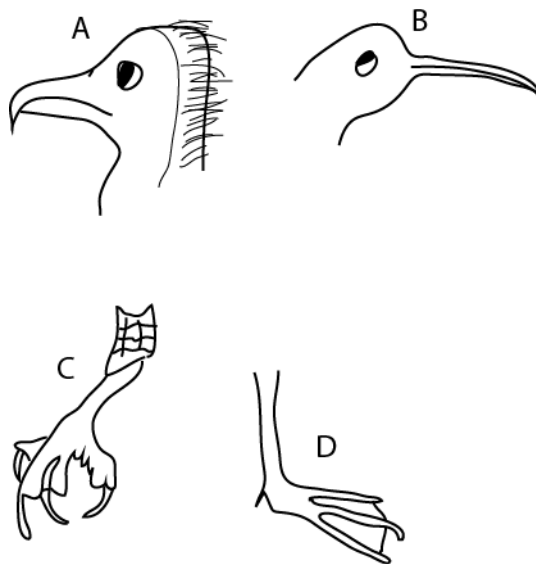
17. To which group of animals does this belong?

Reptiles

18. How does the animal protect itself from its enemies?

By changing color to blend with environment so that it is not easily seen.

19. The diagram below shows the beaks and feet of birds. Use it to answer the questions that follow.



(a) Suggest the type of food that part labelled **A** feed on.

Flesh

(b) How does the bird use the claw (foot) labeled **C** for feeding?

Holding or picking its prey

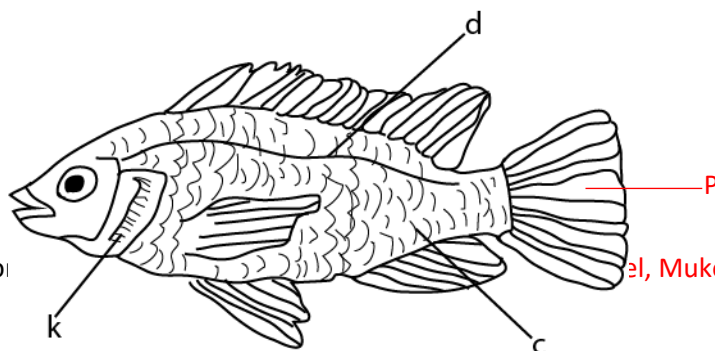
(c) What type of food is suitable for the bird's beak labelled **B**?

Nectar, insects

How useful is the foot labelled **D** to the bird?

For swimming in water

20. The diagram below is a fish. Study it and answer the questions which follow.



- (a) Mark with letter P, the part which enables the fish to move forward.
 (b) What is the function of part marked C?

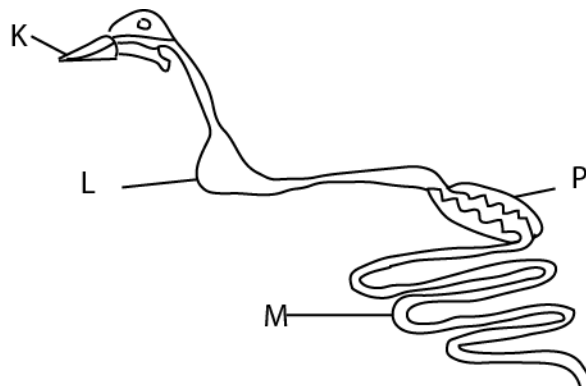
Protect inner part of the body

It is slippery and reduces friction while swimming

- (c) Complete the table to compare the parts marked k and d to those of a goat.

Parts in fish	Name the similar part in a goat
(i) k	Lungs
(ii) d	Ears

21. The diagram below shows the alimentary canal of a bird. Use it to answer the questions that follow.



- (a) What does the bird use part K for?
For picking food
For defense
 (b) What is the function of part L?
Softens food
Pounds food
 (c) What takes place in part marked P?
Grinding food
 (d) How is part marked M useful to the bird?

It is where absorption of food takes place.

22. Give one reason why a bat is a mammal not a bird.

They produce young one alive while birds lay eggs

23. Which of the following animals: fish, frog, lizard, rat and snail is warm blooded?

Rat

24. In which way is the breathing of crocodile different from that of a fish?

Crocodile breathe through lungs while fish breathe through gills

25. State any one agent responsible for dispersing mango seeds

Animals

bird

26. Study the table below and answer the question that follow

LIST A	LIST B
Tilapia	Rat
Frog	Goat
Crocodile	Lion
Dove	whale

(a) What is the similarity in the way animals in list **A** reproduce?

They all lay eggs

(b) To which class of animals do those in list **B** belong?

Mammals

(c) In which way is tilapia in list **A** similar to a whale in list **B**?

Tilapia and bird are swimming animals

(d) What is common about the animals in list **A** and list **B**?

They are vertebrates

27. How does a bat differ from all the other mammals?

A bat flies

28. Draw an example of a foot of a swimming bird in the space provided below.



29. How does each of the following animals protect itself against its enemies?

- (a) Tortoise **by hiding in its shell**
- (b) Wasp **by stinging its enemy**
- (c) Millipede **it coils its body**
- (d) Chameleon: **by changing color to match with environment**

30. Give any one reason why animals move from one place to another

To look for food

To look for mates

31. How does the breathing of an adult frog differ from of a tadpole?

Adult frog breathes by lungs whereas tadpole use gills

32. A cow and a bat are classified as mammals. To which class do the tortoises and lizard belong?

Reptile

33. Give any one way in which the breathing of a housefly is different from that of a rat.

Insects breathes through spiracles whereas rat breathe through lungs.

34. The table below shows different group of vertebrates

Use it to answer the question that follow

A	B	C
Birds	Mammals	Amphibians

(a) to which group of vertebrates does each of the following belong?

- (i) Bat: **mammals**
- (ii) Frog: **amphibian**

- (b) Give any way in which the reproduction of animals in group B is different from that of animals in group C

Animals in group B produce younger ones alive while birds lay eggs

- (c) Give any one other group of vertebrate which is missing from the table.

Reptile

35. Which reptile changes the colour of its body as it moves from one place to another?

Chameleon

36. How are bats different from hens in their way of reproduction?

Bats give birth to young ones whereas hens lay eggs.

37. (a) Give any two characteristics that are common to a frog and a crocodile apart from being vertebrates.

(i) they are both cold blooded animals

(ii) they are both aquatic animals

- (b) How is fertilization of a frog different from that of a crocodile?

Fertilization in frog is external while that of crocodile is internal.

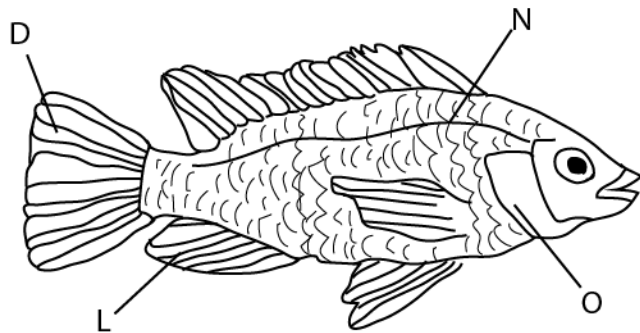
- (c) Name any one other vertebrate that can be classified with a frog

Toad

Salamander

38. The diagram below is of a fish

Study it and answer the questions that follow



- (a) Name the structure marked L

Ventral fin

(b) What is the function of each of the structure marked **D** and **N**?

D: propels the fish

N: detects sound waves

(c) State the function of the structure covered by the part marked **O**

The structure covered is the gills that are used for gaseous exchange

39. Name one cold- blooded vertebrate that has a body shell.

Tortoise, snake,

40. 6. To which down group of animals does the one shown in the diagram below belong?



Mammals

41. How does fish help in controlling the spread of malaria?

Feed on mosquito larvae reducing mosquitoes

42. Give any one use of reptiles to man.

Provide skin for making drums

Provide income from tourist attraction

They are source of medicine such a venom

Source of food

43. Name one domestic used for protection in a home.

Dog

44. Give one pest which destroys the roots of root crops in gardens

Moles, rats or squirrels

45. Write activity that can help to reduce snake bites in homes.

Slashing the bushes around a home and rearing cat to eat snakes

46. Why is an ostrich unable to fly?

Has small wings that cannot support the body

It is too heavy

47. Give one way in which claws are important to birds.

Hunting and gripping prey

Killing and tearing prey

48. The diagram below shows a stage of development of an animal.

Use it to answer the question that follows.



Name one animal that develop from this stage.

Frog or toad

49. (a) Name two scavengers in the environment

(i) Vulture

(ii) Marabou stork

(iii) crows

(iv) Hyena

(b) In which way are scavengers useful in the environment?

Clean the environment

(c) Give the difference between a predator and a scavenger.

Predator kills its prey while the scavengers feed on dead organism

50. (a) Name two water resources in Uganda that provide us with proteins.

(i) fish

(ii) snakes

(iii) hippopotamus

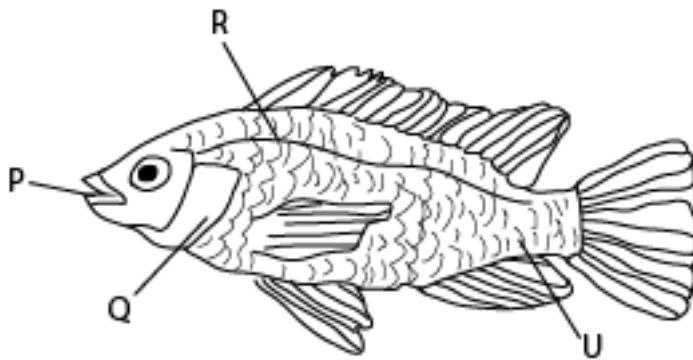
(b) Give two human practices that can lead to the destruction of such resources.

(i) over fishing

- (ii) fishing young fish
- (iii) using poison to kill fish

51. The diagram below is of a fish.

Use it to answer the follow



- (a) Name the part labeled R

Lateral line

- (b) Give the function of the part labeled **P** and **U**

(i) P - **Eating**

(ii) U- **scales protect inner part of the body**

- (c) What structure is covered by the part labeled Q?

Gills

52. (a) states two differences between birds and mammals

- (i) Birds are covered by feathers while animals are covered by hair
- (ii) Mammals have mammary glands while bird do not have

- (b) Give two similarities between birds and mammals

- (i) both are warm blooded
- (ii) both undergo internal fertilization

53. Name any one mammal that lives in water.

Whale,



dolphin,



hippopotamus,



seal



54. 45. Match each animal in A with the correct group to which it belong in B

A	B
Chameleon	Mammals
Toad	Birds
Bat	Reptiles
Ostrich	Amphibians

(a) Chameleon - **reptile**

(b) Toad - **amphibian**

(c) Bat - **mammal**

(d) Ostrich - **bird**

55. Give any one example of a swimming bird.

Duck,



Goose



Penguin



56. How does a fish benefit from its slippery body?

Easily escape from the grip of its enemy

It reduces friction while moving

57. The table below shows lists of animals. Use it to answer the questions

That follow

P	Q	R
Toad	Chameleon	rat
Newt	Snake	Monkey
frog	lizard	Cow

(a) Which characteristic is common to all the animals in the table?

They have a backbone

They have endo skeleton

(b) How is the reproductive in the animals in list P similar to those in list Q?

They lay eggs

(c) Which list has warm blooded animals?

List R

(d) Why would you place a tortoise in list Q?

It is a reptile

58. How is reproduction in whale different from that of fish?

Whales produce younger one alive while fish lay eggs.

Whale undergo internal fertilization while fish undergo external fertilization.

59. Mention the group of birds to which a crested crane belongs

Wading birds



Crested crane

1. Which disease is spread to human by rats?
Plaque

60. (a) To Which class of vertebrates does a toad belong?

Amphibians

(b) Give one way in which the breathing of a toad is different from that of a tadpole

Toad use lungs whereas tadpole use gills for gaseous exchange

(c) State any two ways in which the jelly round the eggs of a toad is important.

(i) protect the eggs from predators

(ii) keep the eggs floating

61. State any one characteristic which shows that a bat is a mammal

Has specialized teeth

Has external ear

Has teats

Body is covered with fur

62. The following is a list of animals that belong to different classes of vertebrates. Use it to answer the questions that follow.

Monkey, parrot, crocodile, Tilapia

(a) In which class of vertebrates does a crocodile belong?

Reptiles

(b) Name the class of vertebrate which is not represented in the above list.

Amphibian

(c) Identify any one animal from the above list which is cold blooded.

Crocodile or tilapia

(d) How is the reproduction of tilapia different from that of the parrot?

Fish undergo external fertilization while parrot undergo internal fertilization

Compiled by Dr. Bbosa Science