Classification of Animals

Synopsis

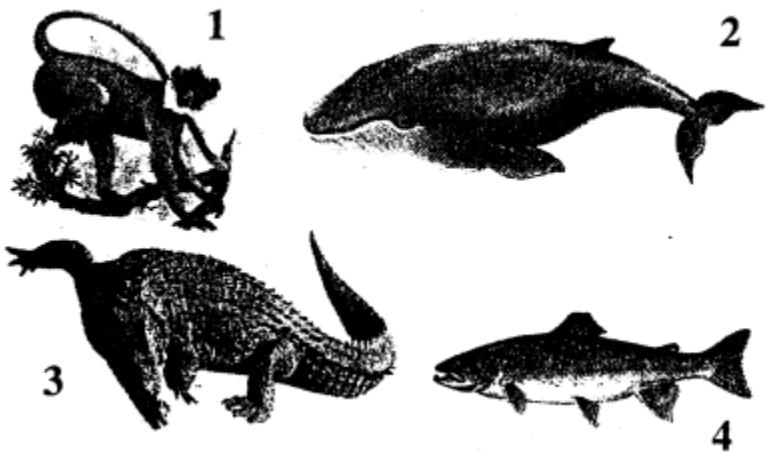
- The animals can move from one place to another in search of food and shelter and this is called locomotion.
- The vertebrates can be classified into five classes:
    1. Pisces (Fishes)
    2. Amphibia (Frogs)
    3. Reptilia (Lizards and Snakes)
    4. Aves (Birds)
    5. (Mammalia (Milk – nourishing animals)
- **Pisces / Fishes**
    1. have streamlined body shape
    2. Locomotion with the help of fins
    3. Body covered with scales.
    4. Breathe through gills.
    5. **Example:** Dogfish, Catla
- **Amphibia / Frogs**
    1. can live in water as well as on land.
    2. always lay their eggs in water.
    3. body covered by a slimy and slippery skin
    4. breathe through lungs and skin.
    5. **Example**: Frog and toads.
- **Reptilia**
    1. Mostly live on land
    2. Skin is dry and scaly
    3. Breathe through lungs
    4. Females lay eggs on land
    5. **Example:** Lizards, snakes, crocodiles
- A**ves / Birds**
    1. Body covered with feathers.
    2. Have wings to fly.
    3. Scales only on legs.
    4. Have jaws with homy beak and have no teeth.
    5. **Example:** Pigeon, hen
- **Mammalia / Milk – nourishing animals.**
    1. Body covered with hairs.
    2. Posses projecting external ears.
    3. Give birth to young ones.
    4. Mothers suckle their young ones.
    5. Have a tail and four limbs. (Tail may become vestigeal)
    6. **Example:** dog, tiger, man.
- **Invertebrates can be further divided into nine groups.**
    1. Protozoans

2. Porifera
3. Coelenterates
4. platyhelminths
5. Nemathelminths
6. Annelids
7. Molluscs
8. Arthropoda
9. Echinoderms

- **Coelenterates**
  1. Now called cnidarians
  2. Body is tube like with only one opening called the mouth.
  3. Mouth is surrounded by finger like processes called tentacles for catching food.
  4. Body radially symmetrical
  5. **Example:** Hydra, Sea-anemone, jelly fish
- **Flatworms / Platyhelminths:**
  are usually found as parasites in the bodies of other animals.
  Example: Tapeworm, liver fluke.
- **Ascaris:** The round worm is found in the small intestine of especially those who eat with the unwashed hands.
- **Annelids:**
  1. are also called segmented worms
  2. body is composed of rings or segments
  3. have a body cavity.
  4. have special organs of excretion called **nephridia.**
     Example: earthworm, leech.
- Arthropods can be further divided into
  1. **Crustacea :** head and thorax are fused and have many jointed legs.
     Example: crab, lobsters etc.
  2. **Myriagoda:** Body is divided into many segments and has one or two pairs of legs on each segment.
     Example: Centipede, millipede.
- **Insecta:** Body is divided into three regions – head, thorax and abdomen.
  — Has three pairs of legs.
  — Have two pairs of wings.
  Example: ant, housefly, butterfly.
- **Arachnida:** Head and thorax fused
  — Have four pairs of legs.
  — Have no wings.
  Example: Spider, Scorpion
- **Echinoderms**
  — also called spiny-skinned animals.
  — Body is star – like or ball – like
  — Have no head or tail.
  — Have no left or right side.
  Example: Starfish, sea urchin.

- A **species** can be defined as a group of individuals having common characteristics and which come together to pro¬duce young ones.
- Scientific name consists of two parts. The first part is the **genus** name while the second part is the **species** name.
  This type of naming is called Binomial nomenclature.
- The animals can be classified also on the basis of their food habits into as follows.
  (a) Herbivorous: Feed on plants e.g. cow, goat.
  (b) Carnivorous: Feed on the flesh of other animals e.g. lion, tiger etc.
  (c) Omnivorous: Feed on both plants as well as flesh of other animals, e.g. man, bear etc.
  (d) Parasites: Live either inside or on the outside of the body of other animals and plants and take food from them.
  Example: Leech, mosquitoes etc.

Activity 3
Look at the four animals shown alongside.
Which four classes of vertebrates are represented by them ? Name these classes.



Answer:
1. Class Mammalia
2. Class Mammalia
3. Class Reptilia
4. Class Pisces

Review Questions

MULTIPLE CHOICE QUESTIONS

1. Tick (✓) the appropriate answer:

(i) Identify the aquatic animal with scaly skin which breathe with gills –
(a) Rohu
(b) Tortoise
(c) Sparrow
(d) Rat

(ii) The unicellular organism causing malaria –
(a) Amoeba
(b) Paramecium
(c) Euglena
(d) Plasmodium

(iii) Identify the animal which is not an Arthropoda —
(a) Prawn
(b) Butterfly
(c) Earthwonn
(d) Spider

(iv) Scientist who introduced binomial nomenclature is —
(a) Charles Darwin
(b) Carolus Linnaeus
(c) Robert Hooke
(d) Gregor Mendel

Short Answer Questions
1. Give two examples of each of the following:
(i) Amphibians:
Ans. Amphibians: 1. Frog 2. Toad
(ii) Segmented worms:
Ans. Segmented worms: 1. Earthworm 2. Leech
(iii) Reptiles:
Ans. Reptiles: 1. Snake 2. Lizard
(iv) Coelenterates:
Ans. Coelenterates : 1. Hydra 2. Jellyfish
(v) Arthropods:
Ans. Arthropods: 1. Crab 2. Centipede
(vi) Flatworms:
Ans. Flatworms: 1. Tapeworm 2. Liverfluke

2. Give names of two animals which are found as parasites inside the human intestine.
Ans. (a) Tapeworm (b)Ascaris ’

3. Name one example each of an animal which shows the following characteristics:
(i) Fixed animals with a pore-bearing body:
Ans. Fixed animals with a pore-bearing body: sponge
(ii) Star-shaped body:
Ans. Star-shaped body: Star-fish
(iii) Can live in water as well as on land:
Ans. Can live in water as well as on land: Frog
(iv) Has a flattened ribbon-like body:
Ans. Has a flattened ribbon-like body: Tapeworm

4. Write one difference each between the following pairs:
(i) Porifera and Coelenterata.
(ii) Arthropoda and mollusca.
(iii) Invertebrates and Vertebrates
(iv) Platyheminthes and Nematoda
Answer:
(i) Porifera and Coelenterata.
Porifera

1. Body is porous i. e. bears many tiny pores to draw water into the body cavity.
2. e.g. Sponge

Coelenterata

1. Sac-like body with only one opening i.e. mouth.
2. e.g. Jelly fish, hydra,sea-anemone.

(ii) Arthropoda and mollusca.
Arthropoda

1. These are animals with
2. They have segmented body.
3. They may or may not have wings
   Example: Crab.

Mollusca

1. Move with the help of a muscular foot.
2. Soft body which is not segmented.

3. Body enclosed in a hard shell Example: Octopus

(iii) Invertebrates and Vertebrates

Invertebrates

1. The animals which do not have a back bone.
2. They are further classified into nine groups.
   Example: Octopus, Starfish.

Vertebrates

1. The animals which have a back bone or a vertebral column.
2. They are further classified in to five groups.
   Example: Human Being, Lizard.

(iv) Platyheminthes and Nematoda
Platyheminthes

1. Body thin and flattened.
2. Mostly live as parasites in the bodies of other animals (hosts)
   e.g. Tapeworm.

Nematoda

1. Body is rounded and unsegmented.
2. Mostly live as parasites in the body of animals including humans.
   e.g. Roundworm commonly called Ascaris.

5. Match the animals given under column A with their respective classification group given under column B –

Column A	**Column B**
(i) Sponge	**(a) Amphibia**
(ii) Snail	**(b) Reptilia**
(iii) Butterfly	**(c) Echinodermata**
(iv) Toad	**(d) Mollusca**
(v) Lizard	**(e) Arthropoda**
(vi) Starfish	**(f) Porifera**

Answer:

Column A	Column B
(i) Sponge	(f) Porifera
(ii) Snail	(d) Mollusca
(iii) Butterfly	(e) Arthropoda
(iv) Toad	(a) Amphibia
(v) Lizard	(b) Reptilia
(vi) Starfish	(c) Echinodermata

6. Write the characteristics of class Aves with reference to their body covering and jaws.

Answer:

The characteristics of class Aves are:

1. Body is covered with feathers.
2. They have wings to aid flying
3. They have scales on legs.
4. They have no teeth.
5. They have jaws provided with homy beaks

7. Categorise the following animals under their appropriate columns of classification.

Animals				
Dog	**Grasshopper**	**Rat**	**Scorpion**	**Toad**
Butterfly	**Lizard**	**Turtle**	**Frog**	**Bat**
Snail	**Honey bee**	**Pigeon**	**Liverfluke**	**Leech**
Cattle	**Snake**	**Rohu**	**Parrot**	**Ascaris**
Earthworm	**Cow**	**Rabbit**	**Monkey**	**Elephant**
Classification :				
Worms	**Molluscs**	**Fishes**	**Ampihbians**	**Reptiles**
Birds	**Mammals**			

Answer:
Worms – Arthropods, Butterfly, Ascaris, Scorpion, Honey bee, Liverfluke, Leech, grasshopper, Eathworm
Molluscs – Snail
Fishes – Rohu
Amphibians – Toad, Frog
Reptiles – Snake, Lizard, Turtle
Birds – Parrot, Pigeon
Mammals – Rat, Bat, Dog, Cattle, Cow, Rabbit, Monkey, Elephant

PRACTICE QUESTIONS

A. Fill in the blanks.

1. **Invertebrates** do not have a backbone, while vertebrates have it.
2. Cnidarians have **radially** symmetrical body.
3. **Tapeworm** and liver fluke live in the intestines of human beings and cattle.
4. **Earthworms** are considered as farmers' friend of farmers.
5. Annelids have special organs of excretion called **nephridia.**
6. **Tapeworms** live in the digestive tract of many vertebrates including human beings.
7. Most arthropods have a tough outer body covering called **exoskeleton.**

B. Fill in the blanks

1. **Insects** have three pairs of jointed legs.
2. Some **myriapods** have two pairs of legs per segment.
3. A **snail** has an external coiled shell.
4. **Lobster** is an example of a crustacean.

EXERCISES

A. Select the most appropriate answer.

1. The finger-like structures present around the mouth of cnidarians are called
a. pseudopodia.
b. tentacles.
c. spines.
d. bristles.

2. Organs of excretion in annelids are
a. gills.
b. nephridia.

c. suckers
d. lungs.

3. Annelids have a
a. soft, unsegmented, bilaterally symmetrical body.
b. soft, cylindrical, segmented, bilaterally symmetrical body.
c. soft, segmented, bilaterally symmetrical body.
d. soft, segmented, laterally symmetrical body.

4. Scorpions and spiders are
a. crustaceans.
b. arachnids,
c. myriapods.
d. insects.

5. The body temperature of warm-blooded animals
a. keeps fluctuating.
b. changes according to the temperature of the environment.
c. does not change with the change in the temperature of the environment.
d. decreases when the temperature of the envionment increases.

6. Bones with large air cavities are present in
a. cnidarians.
b. fish.
c. annelids.
d. birds.

7. Milk in the body of mammals is produced by
a. sweat glands.
b. salivary glands,
c. mammary lands.
d. none of these

B. Fill in the blanks.

1. The animals without a backbone whose body is soft and often covered by a hard shell are **molluscs.**
2. Invertebrates with jointed legs belong to **arthropods.**
3. The backbone of vertebrates is made up of a number of small bones called **vertebrae.**
4. Fishes obtain oxygen from water through **gills.**
5. Vertebrates which spend a part of their life on land but reproduce in water are called **amphibian**

C. Match the following.

Group		Characteristics
1. molluscs	a.	feed milk to young ones, warm-blooded
2. sponges	b.	bag-like body with tentacles around the opening
3. flatworms	c.	fins, gills and cold-blooded
4. mammals	d.	body with large opening and many small pores all over
5. fish	e.	jointed legs, exoskeleton
6. cnidarians	f.	have only one opening
7. arthropods	g.	hard shell, soft body
	h.	cylindrical, unsegmented body with mouth at one end and anus at the posterior end

Answer:

Group		Characteristics
1. molluscs	e.	jointed legs, exoskeleton
2. sponges	d.	body with large opening and many small pores all over
3. flatworms	f.	have only one opening
4. mammals	a.	feed milk to young ones, warm-blooded
5. fish	c.	fins, gills and cold-blooded
6. cnidarians	b.	bag-like body with tentacles around the opening
7. arthropods	g.	hard shell, soft body

D. Differentiate between
1. flatworms and roundworms
2. insects and crustaceans
3. amphibians and pisces
4. aves and mammals
5. radially symmertical and bilaterally symmetrical body
6. warm-blooded and cold-blooded animals.

Answer:

1. flatworms and roundworms

Flatworms

1. They are also called as Platyhelminthes.
2. They have flat ribbon like bodies.
3. They have a single opening to take in food and get rid of wastes.
4. e.g. Tapeworm, liver fluke.

Roundworms

1. They are also called as Nemathelminthes.
2. They have cylindrical bodies.
3. They have two separate openings for the mouth and anus.
4. e.g. Pinworm, Ascaris.

2. insects and crustaceans

Insects

1. Body of insects is divided into three regions-head, thorax and abdomen.
2. Most of them have three pairs of legs.
3. Most of them have wings.
4. e.g. Housefly, butterfly.

Crustaceans

1. Head and thorax are fused in crustaceans.
2. They have many number of jointed legs.
3. Wings are absent.
4. e.g. Crab, lobster.

3. amphibians and pisces

Amphibians

1. They can live both on land and in water.
2. Body of amphibians is covered with slimy- slippery skin.
3. They breathe through lungs and skin.
4. e.g. Frogs, toad.

Pisces

1. They live in water.
2. Their body is covered with scales.
3. They breathe through gills.
4. e g. Shark, sea-horse.

4. aves and mammals

aves

1. Their body is covered withfeathers.
2. Forelimbs are modified into wings to fly.
3. They have a horny beak with no teeth.
4. They lay eggs. with no teeth.
5. They don't have mammary glands.
6. They have hollow bones.
7. e.g. Crow, parrot.

Mammals

1. They have hair on their body. .
2. Forelimbs exist as hand, paw or hooves.
3. They have a mouth with teeth.
4. They give birth to young ones.
5. They have mammary glands i.e. they suckle their babies.
6. They have solid bones.
7. e.g. Humans, dog.

5. radially symmertical and bilaterally symmetrical body

Radially symmertical

1. It is a body that can be divided vertically into two equal halves along any plane passing through the central point.
2. Examples: Starfish, jellyfish, Hydra, corals, etc.

Bilaterally symmetrical body

1. It is a body that can be divided into two equalhalves only through one plane.
2. Examples: Tapeworm,insects, lizard, humans, etc.

6. warm-blooded and cold-blooded animals.

Warm-blooded

1. The temperature of the body of warm-blooded animals remains constant and does not change with the temperature of their surroundings.
2. Examples : Birds, humans, dogs, etc.

Cold-blooded animals

1. The temperature of the body of cold-blooded animals changes with the temperature of their suroundings.
2. Examples: reptiles, fish, frogs, etc

E. State if the following statements are true or false. Correct the statement if it is false.

1. A tapeworm is a flatworm that lives in the human intestine.
   True.
2. Arthropods have a soft, outer covering called endoskeleton.
   False : Arthropods have a tough, outer covering called exoskeleton.
3. Insects belong to the amphibian group of animals.
   False : Insects belong to the arthropod group of animals.
4. Fish have fins, scales and they breathe through gills.
   True.
5. Reptiles have a scaly skin. They lay eggs with a hard shell and are warm-blooded animals.
   False : Reptiles have a scaly skin. They lay eggs with a hard shell and are cold-blooded animals.

F. Find the odd one out. Give reasons.

1. ant, cockroach, spider, dragonfly
Ans. spider : spider is odd one out because it is an arachnid whereas rest three are insects.
2. frog, shark, seahorse, carp
Ans. frog : frog is an amphibian while other three are fishes.
3. snail, oyster, earthworm, octopus
Ans. earthworm : earthworm is an annelid whereas rest three are molluscs.
4. snake, alligator, eel, turtle
Ans. eel: eel is a fish whereas the other three animals are reptiles.
5. sea urchin, starfish, brittle star, jellyfish
Ans. jellyfish : jellyfish belongs to Cnidarians whereas the rest three are echinoderms. ,
6. jellyfish, Hydra, sea anemone, butterfly
Ans. butterfly : butterfly is an insect whereas rest three are Cnidarians.

G Write short answers. –

Question 1.
What are invertebrates ?
Answer:
Invertebrates are animals without a backbone, e.g. Insects, worms.

Question 2.
(a) What do you mean by radially symmetrical body ? (b) Give two examples of Platyhelminthes.
Answer:
(a) Radially symmetrical body is the body that can be divided into two identical halves along any plane, e.g. Star fish, jelly fish.
(b) Two examples of Platyhelminthes are tapeworms and liver fluke.

Question 3.
Name the special organs of excretion in annelids ?
Answer:
Annelids have a special organ of excretion called nephridia.

Question 4.
What is an exoskeleton ? How is it different from a backbone ?
Answer:
Exoskeleton is a tough outer covering of an animal body. e.g. Crab, lobster have exoskeletons.

Exoskeleton

1. It is a rigid external covering of the body that provides support and protection to the body.
2. It is present in invertebrates.
3. Examples : Crab, lobster, spiders, scorpions, etc.
4. It is in the form of shell, or scales or feathers, etc.

Backlone

1. It is an internal skeleton (endoskeleton) that provides support and protection to the body.
2. It is present in vertebrates.
3. **Examples:** Humans, fish lions, dogs, etc.
4. It is made up of number of vertebral joined to form a vertebral column.

Question 5.
Write two examples of myriapods.
Answer:
Centipede and Millipede

Question 6.
How are the bones of birds different from those of other vertebrates ?
Answer:
The bones of birds have large air cavities (are hollow) and hence are light. This enables them to fly. On the other hand, bones of other vertebrates are dense and solid and form a _ heavy skeleton.

H. Answer in detail.

Question 1.
Write a short note on annelids.
Answer:
Annelids are invertebrates which include segmented worms. They are found in moist soil and pond water. They have a soft, cylinderical and bilaterally symmetrical body. Their body surface is marked into ring-like compartments called segments which help in movement. They have a special organ of excretion called nephridia. Examples : Leech and earthworm.

Question 2.
Name the different classes of arthropods. Write one characteristic feature of each class.
Answer:
Arthropods are inverteberates with joined legs, segmented body and bilaterally symmetrical body which is divided into head, thorax and abdomen.
Anthropods are further classified into –

1. **Arachnids –** They have fused head and thorax, four pairs of legs, hard exoskeleton, no wings and antennae. Examples : Scorpions and spiders.
2. **Crustaceans –** They have fused head and thorax, appendages on all segments, variable number of jointed legs and two pairs of antennae extending from the head. Examples: lobsters and sprimps.
3. **Myriapods –** Body divided into large number of segments and have two pairs of legs per segment (example: millipede) or one pair of legs per segment (Example : centipede). Number of legs may vary from 20 to 200.
4. **Insects –** Their body is divided into head, thorax and abdomen. They have three pairs of legs, two pairs of wings (some have one pair or none) and a pair of antennae. Examples : ants and butterflies.

Question 3.
Write two characteristics each of
a. birds
b. amphibians .
c. reptiles
d. mammals
Answer:
Two characteristics of:
a. Birds:

1. They are warm blooded animals with feathers on their body.
2. They have homy beak and do not have teeth.

b. Amphibians:

1. They are animals which can live both on land and in water.
2. They breathe through lungs and skin.

c. Reptiles :

1. They are land animals with dry scaly skin on then- body.
2. They breathe through lungs.

d. Mammals:

1. They are warm blooded animals with hair on their body.
2. They give birth to babies and are the only animals that produce milk for nourishing their young ones.

Question 4.
List two notable characteristic of birds which is not found in any other group of animals ?
Answer:
The most notable characteristic of birds which is not found in any other group of animals is the presence of feathers. They are the only animals on earth which have a backbone as well as feathers which cover their entire body.
Also, their skeleton is light as their bones have air cavities and are hollow. They also have beaks with no teeth.

Question 5.
Why are mammals regarded as the most advanced animals ?
Answer:
Mammals are regarded as the most advanced animal because they are the most recently evolved vertebrates who have the most advanced, complex brain, are the only animals that produce milk for their young ones and give birth to babies.

Question 6.
How will you classify animals according to the food they eat ?
Answer:
On the basis of food they eat, animals are classified as –

1. **Herbivores –** They eat only green plants as food. Examples : cow, goat, etc.
2. **Carnivores –** They eat only the flesh of other animals as food. Examples : tiger and lion, etc.
3. **Omnivores –** They eat both plants as well as the flesh of other animals as food. Examples : bear, crow, man, etc.

Question 7.
List four characteristics of reptiles.
Answer:
Four characteristics of reptiles are :

1. They are cold blooded vertebrates.
2. They have dry skin covered with scales.
3. They lay eggs that have leathery shells.
4. They breathe through lungs.
   e. g. : Lizard, crocodile.

Question 8.
How do fish exchange gases ?
Answer:
Fish exchange gases in water through gills. Gills enable the fish to obtain oxygen dissolved in the water.

Question 9.
How are the bones of birds different from those of other vertebrates ?
Answer:
The bones of the birds are hollow and filled with large air cavities. This makes their skeleton light and enable them to fly. On the other hand, bones of other vertebrates are dense and solid and form a heavy skeleton.

Question 10.
You are asked to classify an animal in the correct group. The animal has a soft body and arm-like tentacles. You dissect the animal and find that it has an internal shell. Is the animal a cnidarian or a mollusc ? Explain your answer.
Answer:
The animal is a mollusc because although both molluscs and cnidarians have soft bodies and tentacles but only molluscs have shells (internal or external) and cnidarians don’t.

Question 11.
How do warm-blooded and cold-blooded animals differ?
Answer:
Warm blooded animals are those animals whose body temperature remain same and is not affected by the temperature of their surroundings, e.g. Birds, Humans.
Cold blooded animals change their body temperature with the change in the temperature of their surroundings, e.g. Fish, reptil

I. Classify the given animals into different categories indicated.
Question 1.
Jellyfish, liver fluke, pinworm, Ascaris, tapeworm, Hydra, sea anemone into cnidarians, Platyhelminthes and Nemathelminthes.
Answer:

- **Cnidarians —** Jelly fish, Hydra, sea anemone.
- **Platyhelminthes —** Liver fluke, tapeworm.
- **Nemathelminthes —** Pinworm, Ascaris.

Question 2.
Crab, millipede, butterfly, ant, scorpion, centipede, spider, lobster, moth, prawn into arachnids, crustaceans, myriapods and insects.
Answer:

- **Arachnids —** Scorpion, spider.
- **Crustaceans** — Crab, lobster, prawn.
- **Myriapods** — Millipede, centipede.
- **Insects** — Fly, ant, moth.

J. Give reasons for the following.

Question 1.
What happens to the body temperature of a fish when the temperature of water drops ?
Answer:
Since fish are cold blooded animals, the temperature of their body also drops when the temperature of water drops.

Question 2.
Why do adult amphibians tend to stay near water ?
Answer:
Adult amphibians tend to stay near water because they have to return to water to reproduce and they always lay their eggs in water, e.g. frog. ‘

K. Given below are groups of animals, and their characteristics features. Some of the features are incorrect. Identify the odd one out in each.

Group	Characteristic Features	Odd one out
Porifera	**porous animals, have tentacles, fixed to surface**	
Amphibia	**cold blooded, lungs in adults, scaly skin**	
Aves	**cold blooded, wings, feathers, bones with large air spaces**	
Pisces	**live in water, scaly skin, warm blooded, fins for swimming**	

Answer:

Group	Characteristic Features	Odd one out
Porifera	porous animals, have tentacles, fixed to surface	have tentacles
Amphibia	cold blooded, lungs in adults, scaly skin	scaly skin
Aves	cold blooded, wings, feathers, bones with large air spaces	cold blooded
Pisces	live in water, scaly skin, warm blooded, fins for swimming	warm blooded