



5

UNDERSTANDING DIVERSITY OF LIVING THINGS

Learning Outcomes

Candidates should be able to:

Knowledge, Understanding and Application

- (a) show an awareness of biodiversity as the variety of life on earth, including variety within each species of plant and animal
- (b) recognise that classifying living things into major taxonomic groups enables us to make sense of the biodiversity around us
- (c) show an awareness that bacteria could have beneficial or harmful effects (e.g. bacteria in the digestive tract could help in digestion or cause infections)
- (d) recognise the importance of biodiversity to the stability of natural systems, and its benefits to humans (provision of resources like food, medicine, raw materials, etc.)

Skills and Processes

- (a) construct and use simplified dichotomous keys in identifying and classifying living organisms

Ethics and Attitudes

- (a) discuss the reasons for the depletion or extinction of some plants or animals (e.g. hunting, disease, invasive species, changes to or destruction of habitat)
- (b) show an awareness of how teamwork and perseverance are important in the study of biodiversity



Classification of plant and animal life

MCQs

05-M-01

Organisms are classified according to certain fundamental features. Which of the following is **NOT** considered a fundamental feature?

- (A) The body structure of the animal.
- (B) How the animal reproduces itself.
- (C) The colour of the animal.
- (D) How the animal feeds.



05-M-02

What do puffer fish and penguin have in common?

- (A) They are cold blooded animals.
- (B) They are warm blooded animals.
- (C) They are vertebrates.
- (D) They are invertebrates.



05-M-03

Animal X has body temperature that fluctuates with their surroundings. It takes in oxygen through its gills and is protected by slimy hard scales. Which group is it most likely belong to_____?

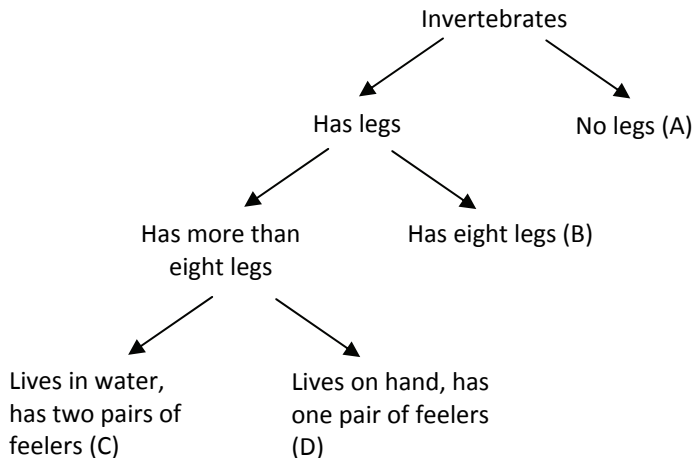
- (A) Reptile
- (B) Amphibian
- (C) Insect
- (D) Fish





05-M-04

In the dichotomous key below, the prawn would best fit into the group labelled _____.



05-M-05

Use the simple dichotomous key to identify the following six animals: Shark, Sheep, Monitor lizard, Dove, Mosquito, Frog:

Key

- | | |
|------------------------------|-------|
| 1. Has wings | 2. |
| Does not have wings | 3. |
| 2. Has backbone | (I) |
| Does not have backbone | (II) |
| 3. Lay eggs | 4. |
| Does not lay eggs | 5. |
| 4. Has dry scaly skin | (III) |
| Does not have dry scaly skin | (IV) |
| 5. Lives in water | (V) |
| Lives on land | (VI) |

	(I)	(II)	(III)	(IV)	(V)	(VI)
(A)	Dove	Mosquito	Monitor Lizard	Frog	Shark	Sheep
(B)	Mosquito	Dove	Monitor Lizard	Frog	Shark	Sheep
(C)	Dove	Mosquito	Frog	Monitor Lizard	Shark	Sheep
(D)	Mosquito	Dove	Frog	Shark	Monitor Lizard	Sheep



05-M-06

Which of the following are characteristics of the seedless plants, algae?

- (I) Have no roots.
- (II) Have no stems.
- (III) Have no leaves.
- (IV) Live in water or wet places.

- (A) (I) and (II)
- (B) (II) and (IV)
- (C) (III) and (IV)
- (D) All of them



05-M-07

Invertebrates are animals that _____.

- (A) have back bones
- (B) have exo-skeletons
- (C) do not have back bones
- (D) do not have exo-skeletons



05-M-08

What are the reasons why scientists classify living things?

- (I) Classification makes it easier for us to study the living things.
- (II) Classification allows us to understand living things better.
- (III) Classification allows us to easily identify new species of living things.
- (IV) Classification makes it easier for us to protect ourselves from harm.

- (A) (I) and (III)
- (B) (II) and (IV)
- (C) (I), (II) and (III)
- (D) (I), (II) and (IV)





05-M-09

Which of the following statement(s) related to mushroom is **INCORRECT**?

- (I) It is an algae.
- (II) It is reproduced by seeds.
- (III) It has no chloroplasts.
- (IV) It feeds on dead organisms.

- (A) (I) and (II)
- (B) (I) and (III)
- (C) (I), (II) and (III)
- (D) (II), (III) and (IV)

05-M-10

Which of the following reproduce(s) by spores?

- (I) Virus
- (II) Moss
- (III) Pine tree
- (IV) Bird nest fern

- (A) (II) only
- (B) (IV) only
- (C) (I) and (II)
- (D) (II) and (IV)

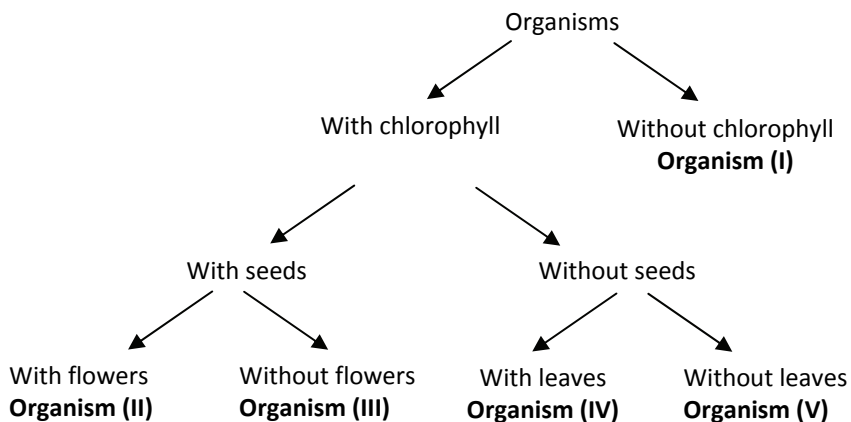
05-M-11

How is the scientific name of an organism obtained?

	<u>First name</u>	<u>Second name</u>
(A)	Species	Class
(B)	Species	Genus
(C)	Genus	Family
(D)	Genus	Species

05-M-12

The following is a simple dichotomous key used to identify several organisms:



	<u>Organism (I)</u>	<u>Organism (II)</u>	<u>Organism (III)</u>	<u>Organism (IV)</u>	<u>Organism (V)</u>
(A)	Fern	Grass	Pine	Moss	Algae
(B)	Moss	Pineapple	Grass	Algae	Fern
(C)	Fungus	Pineapple	Grass	Fern	Algae
(D)	Fungus	Grass	Pine	Moss	Algae

05-M-13

Dichotomous keys divide a group into _____.

- (A) two smaller groups each time.
- (B) three smaller groups each time
- (C) two smaller groups twice
- (D) three or less smaller groups each time

05-M-14

Linnaean taxonomy is a method of classifying living things and all species are classified in a ranked hierarchy. Which of the following shows the correct hierarchy?

- (A) Kingdom, phylum, class, order, family, genus, species
- (B) Kingdom, class, family, species, genus, phylum, order
- (C) Kingdom, family, phylum, order, class, species, genus
- (D) Kingdom, order, class, phylum, genus, family, species



05-M-15

Which of the following statements about amphibians is **INCORRECT**?

- (I) Amphibians spend all their lives in water.
 - (II) Young amphibians breathe through their lungs and skin.
 - (III) The body temperature of amphibians does not change with the environment.
 - (IV) The process of change from young to adult for amphibians is metamorphosis.
- (A) (I), (II) and (III)
 - (B) (I), (II) and (IV)
 - (C) (II), (III) and (IV)
 - (D) All of them



05-M-16

Which of the following statements about birds is correct?

- (I) All birds can fly.
 - (II) All birds have wings.
 - (III) Birds have streamlined bodies covered with feathers.
 - (IV) The body temperature of birds does not change with the environment.
- (A) (I), (II) and (III)
 - (B) (I), (II) and (IV)
 - (C) (II), (III) and (IV)
 - (D) All of them



05-M-17

Arthropods are invertebrates with segmented bodies and jointed limbs. Which of the following animals can be classified as an arthropod?

- (A) Bat
- (B) Frog
- (C) Lizard
- (D) Spider



05-M-18

Man is a mammal because _____.

- (A) he feeds on both plants and animals
- (B) he moves around to search for food
- (C) his temperature changes with the environment
- (D) he is warm blooded



05-M-19

Which of the following is NOT sea mammal?

- (A) Dugong
- (B) Platypus
- (C) Seal
- (D) Walrus



05-M-20

Which of the following plants produce seeds?

- (I) Pine
 - (II) Tulip
 - (III) Dragon's scale fern
 - (IV) Club moss
-
- (A) (I) and (II)
 - (B) (I) and (IV)
 - (C) (II) and (III)
 - (D) (III) and (IV)



05-M-21

Which of the following is **NOT** classified under the plant kingdom?

- (A) Conifers
- (B) Ferns
- (C) Mosses
- (D) Protists





05-M-22

How is a shark different from a whale?

- (A) A shark has moist skin unlike a whale.
- (B) A shark is warm blooded unlike a whale.
- (C) A shark has no backbone unlike a whale.
- (D) A shark breathes through its gills while a whale breathes through its lung.



05-M-23

Which of the following do **NOT** have true roots?

- (A) Conifers
- (B) Compound Ferns
- (C) Simple Ferns
- (D) Mosses



05-M-24

Which of the following animals have exoskeleton?

- (I) Butterfly
 - (II) Frog
 - (III) Lobster
 - (IV) Mite
- (A) (I), (II) and (III)
 - (B) (I), (III) and (IV)
 - (C) (II), (III) and (IV)
 - (D) All of them



05-M-25

Which of the following statements about annelids is correct?

- (A) Annelids may be parasitic or mutualistic.
- (B) Annelids have jointed legs on each segment.
- (C) Annelids take in oxygen through their scaly skin.
- (D) Annelids are soft-bodied animals with hard outer shells.



05-M-26

The following information is related to the habitat of algae, fern and mosses.

Habitat (I)	Habitat (II)	Habitat (III)
Damp and shady	Damp but bright	Very damp or in water

Which of the following shows the correct habitat for the above three plants?

	<u>Habitat (I)</u>	<u>Habitat (II)</u>	<u>Habitat (III)</u>
(A)	Fern	Mosses	Algae
(B)	Mosses	Fern	Algae
(C)	Fern	Algae	Mosses
(D)	Mosses	Algae	Fern



05-M-27

Which of the following shows the similarities between hibiscus and rose?

- (A) Both reproduce by spores.
- (B) Both have stems and leaves.
- (C) Both have needle-like leaves.
- (D) Both are non-flowering plants.





Questions

05-Q-01

- (a) What are the two major groups of plants?
- (b) The pine tree is a type of conifer that can be found in most of the northern hemisphere, while the bird's nest fern is a type of fern that can be found in tropical regions.
- (i) Write down two similarities between conifers and ferns.
- (ii) Write down two differences between conifers and ferns.
- (c) Algae are also considered as plants.
- (i) Write down two characteristics of algae.
- (ii) Write down a similarity between algae and ferns.
- (iii) Write down a difference between algae and ferns.
- (d) Can we classify fungi under Kingdom Plants? Provide a reason to support your answer.



05-Q-02

Construct a simple dichotomous key in the space provided below to identify the following animals:

- (a) Dolphin
- (b) Lizard
- (c) Snake
- (d) Dragonfly
- (e) Ant



05-Q-03

Lizard and salamander are classified under the same class of animals.

- (a) Is the statement above true or false?
- (b) Provide three reasons to support your answer.
- (c) State the classes which the lizard and salamander belong to.
- Lizard: _____
- Salamander: _____



05-Q-04

Animals can be classified based on the type of food they eat. Classify the following animals into three differently named groups.

Bear	Owl
Bee	Rabbit
Caterpillar	Scorpion
Chicken	Squirrel
Lizard	Toad
Man	Woodpecker

05-Q-05

An experiment was set up to show that tadpoles breathe through their gills.

- Write the procedures to describe how you would carry out this experiment.
- Write down your observation.
- Explain your observation.

05-Q-06

There are many different ways of classifying animals. Study the table below and fill in the blanks with the appropriate answers.

Animals	Body covering	Reproduction	Method of breathing
Crocodile	(a)	Lay eggs	Lungs
Eagle (b)	Feathers	Lay eggs	(b)
Rat (m)	(c)	(d)	Lungs
Salmon	(e)	Lay eggs	(f)
Swordtail	Scales	(g)	(h)
Termite	(i)	(j)	Breathing tubes



05-Q-07

(a) Arthropods can be sub-divided into insects, myriapoda, arachnids and crustaceans.

Fill in the blanks with a physical characteristic of the following sub groups.

Arthropods	Physical Characteristic
(i) Insects	
(ii) Myriapoda	
(iii) Arachnids	
(iv) Crustaceans	

(b) Can we classify arthropods under vertebrates? Provide a reason to support your answer.



Answer keys:**MCQs**

05-M-01	C
05-M-02	C
05-M-03	D
05-M-04	C
05-M-05	A
05-M-06	D
05-M-07	C
05-M-08	C
05-M-09	A
05-M-10	D
05-M-11	D
05-M-12	D
05-M-13	A
05-M-14	A
05-M-15	A
05-M-16	C
05-M-17	D
05-M-18	D
05-M-19	B
05-M-20	A
05-M-21	D
05-M-22	D
05-M-23	D
05-M-24	B
05-M-25	A
05-M-26	B
05-M-27	B

Questions**05-Q-01**

(a) Two major groups of plants are flowering plants and non-flowering plants.

(d) No

05-Q-03

(a) False

05-Q-06

(a) Scaly skin

(b) Lungs

(c) Fur

(d) Give birth to their young alive

(e) Scales

(f) Gills

(g) Give birth to their young alive

(h) Gills

(i) Exoskeleton

(j) Lay eggs

05-Q-07

(b) No