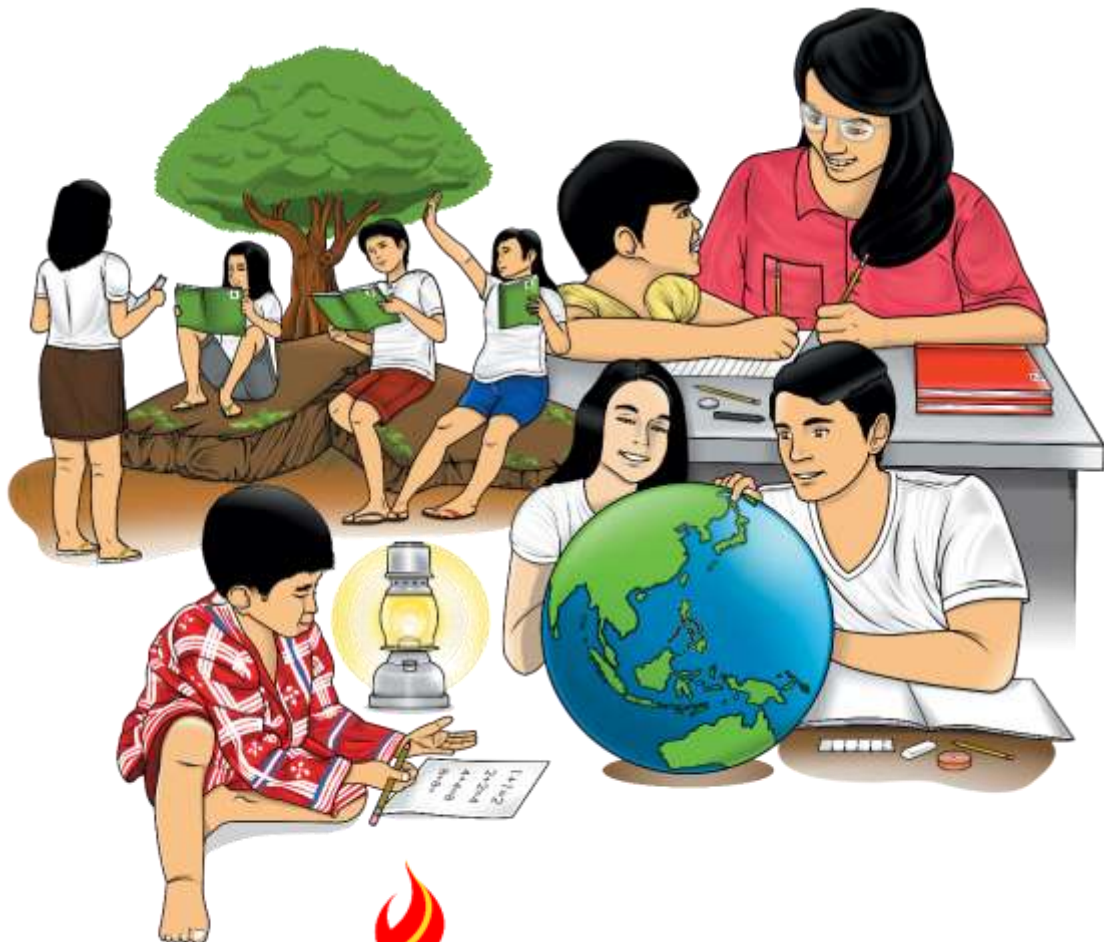


Science

Quarter 4 – Module 6: Hierarchical Taxonomic System of Classification



Science – Grade 8
Alternative Delivery Mode
Quarter 4 – Module 6: Hierarchical Taxonomic System of Classification
First Edition, 2020

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Science

Quarter 4 – Module 6: Hierarchical Taxonomic System of Classification

Introductory Message

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.



What I Need to Know

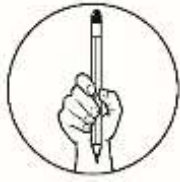
This module was designed and written with you in mind. It is here to help you master the hierarchical taxonomic system of classification. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the learner's material you are now using.

The module contains:

- **Lesson 1** – Hierarchical Taxonomic System of Classification

After going through this module, you are expected to:

1. Familiarize the Linnaean Hierarchical System of Classification;
2. Use the genus and species level of classification in naming living organism;
and
3. Classify organisms using the hierarchical taxonomic system (**MELC Week 4 S8LT-IVh-20**).



What I Know

Directions: Choose the letter of the correct answer. Write your answers on a separate sheet of paper.

- Which is the largest category in classifying organisms?
A. class
B. domain
C. family
D. species
- Which biological classification comprises organisms that serve common characteristics and are capable of reproducing their own kind?
A. class
B. domain
C. family
D. species
- Which two domain systems were used by scientists to classify living organisms before they came up with the three domain systems?
I. Archaea II. Bacteria III. Eukarya IV. Protista
A. I and II
B. I and III
C. II and III
D. I, II and III
- Which arrangement reflects the Linnaean Hierarchical System of Classification in descending order?
A. domain–kingdom–phylum–class–order–family–genus–species
B. domain–phylum–genus–species–class–order–family–kingdom
C. kingdom–domain–phylum–genus–species–class–order–family
D. kingdom–domain–phylum–genus–species–class–family–order
- Which of the following is the common characteristic of fishes, birds, mammals, reptiles, and amphibians?
A. They are vertebrates.
B. They are invertebrates.
C. They are all warm-blooded.
D. They possess mammary glands.

6. Scientific names are derived from the _____.
- species classification using its species as first name
 - genus classification using its genus as first name
 - binomial system of classification having the first name based on its genus and second name based on the species classification
 - binomial system of classification having the first name based on its genus and second name based on the species classification written in italicized form
7. Which of the scientific names below is INCORRECTLY written?
- | | |
|-----------------------------|--------------------------|
| I. <i>Felis catus</i> | III. <i>Oriza sativa</i> |
| II. <i>Canis familiaris</i> | IV. panthera leo |
- I only
 - I only
 - III only
 - V only
8. Which of the following describes artificial system of classification?
- Uses morphological characteristics of organisms
 - Groups comparable organisms capable of reproducing their own kind
 - Classifies organisms based on their structure and economic importance
 - A system related to the evolutionary development, history, and relationships among individuals or groups of organisms
9. Who is the Father of Modern Taxonomy who first named plants and other living organisms?
- | | |
|----------------------------|------------------|
| A. Antonie van Leeuwenhoek | C. Gregor Mendel |
| B. Carolus Linnaeus | D. Isaac Newton |
10. Which of these groups live and settle in diverse places and even in the most extreme environments?
- | | |
|---------------|-------------|
| A. Archaea | C. Eukarya |
| B. Eubacteria | D. Protista |
11. Which group of living organisms belongs to Archaea Domain?
- | | |
|------------------|--------------------------------|
| I. Algae | III. Mammals |
| II. Thermophiles | IV. Methanogens and Halophiles |
- I and II
 - II and III
 - II and IV
 - I and IV

12. Which two big groups of plants are classified in terms of presence or absence of vessels for food and water transportation?
- vascular and nonvascular
 - gymnosperms and angiosperms
 - seed-bearing and cone-bearing plants
 - flowering plants and non-flowering plants
13. Which of the following kingdoms are under the domain Eukarya?
- | | |
|-----------------------|--------------------------|
| I. Fungi | III. Animal |
| II. Plant and Protist | IV. Protist and Bacteria |
- I only
 - I and III
 - I, II and III
 - I, II and IV
14. How did scientists come up with the three domain systems?
- Prokaryotes have been divided into two domains: Archaea and Bacteria
 - The eukaryote group has been retained and now classified under the fifth domain Eukarya
 - The eukaryote group has been retained and now classified under the fourth domain Eukarya.
 - Prokaryotes have been divided into two domains namely: Archaea and Bacteria while the eukaryotes have been retained and now classified under the third domain Eukarya.
15. Which statement is correct about the difference between the domains Archaea and Bacteria?
- Archaea domain possesses true nucleus while bacteria domain does not.
 - Bacteria domain possesses true nucleus while Archaea domain does not.
 - Archaea species can live and settle in diverse places and some even in the most severe environments while bacteria species cannot.
 - Bacteria species can live and settle in diverse places and some even in the most severe environments while Archaea species cannot.

Lesson

1

Hierarchical Taxonomic System of Classification

Understanding the concepts and principles of taxonomic system of classification enhances your ability to classify living things. It also helps you to understand how species are named and classified.

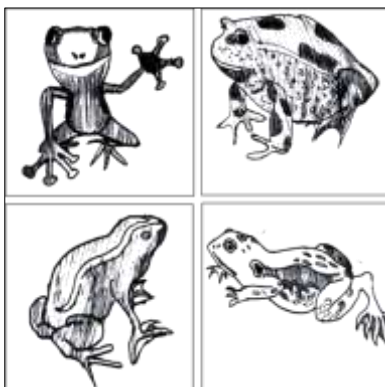
Organisms are classified according to their physical characteristics from the highest in the taxonomic hierarchy which is the Domain, to the lowest in the taxonomic hierarchy, the Species.



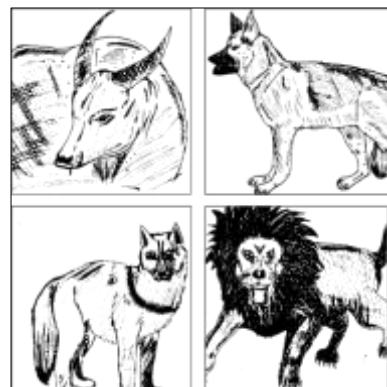
What's In

Activity 1. Four Pics One Word

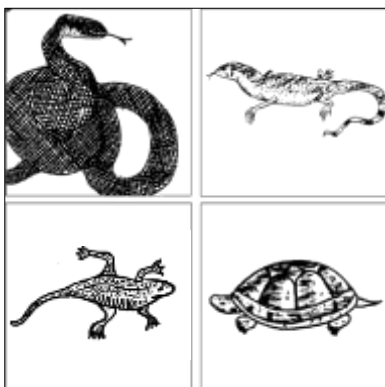
Directions: Supply the missing letters to complete the word that refers to each set of four pictures. Write your answers on a separate sheet of paper.



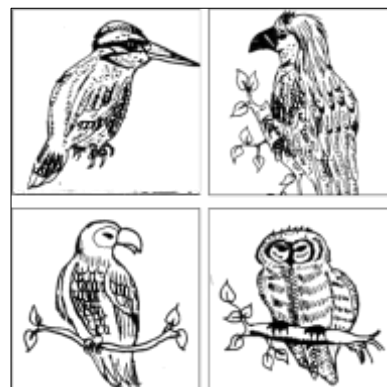
1. A _ P H _ _ IA _ _



2. M A _ _ _ L _



3. R E _ _ I L _ _



B _ _ _ S

Illustrated by: Jubane, Jame-Son G.



What's New

Activity 2. Writing Scientific Name!

Directions: The scientific name of the given organisms below are incorrectly written. Write the correct form of the scientific name on a separate sheet of paper. Number one (1) is done for you.

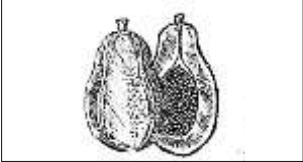
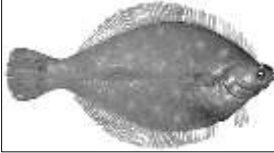








<p>1. Papaya</p>  <p>Scientific Name: CARICA PAPAYA Answer: <i>Carica papaya</i></p>	<p>6. Flat fish/ Padpad</p>  <p>Scientific Name: PSEUDORHOMBUS DUPLICIOCELLATUS</p>
<p>2. Common Name: Blue pea</p>  <p>Scientific Name: CLITORIA TERNATEA</p>	<p>7. Common Name: Human</p>  <p>Scientific Name: HOMO SAPIENS</p>
<p>3. Common Name: Star fish</p>  <p>Scientific Name: PROTOREASTER NODOSUS</p>	<p>8. Common Name: Jackfruit</p>  <p>Scientific Name: ARTOCARPUS HETEROPHYLLUS</p>
<p>4. Common Name: Brittle star</p>  <p>Scientific Name: OPHIOTHRIX FRAGILIS</p>	<p>9. Common Name: Cacao</p>  <p>Scientific Name: THEOBROMA CACAO</p>
<p>5. Miracle tree/ Calabash</p>  <p>Scientific Name: CRESCENTIA CUJETE</p>	<p>10. Cardava bananas</p>  <p>Scientific Name: MUSA ACUMINATA</p>

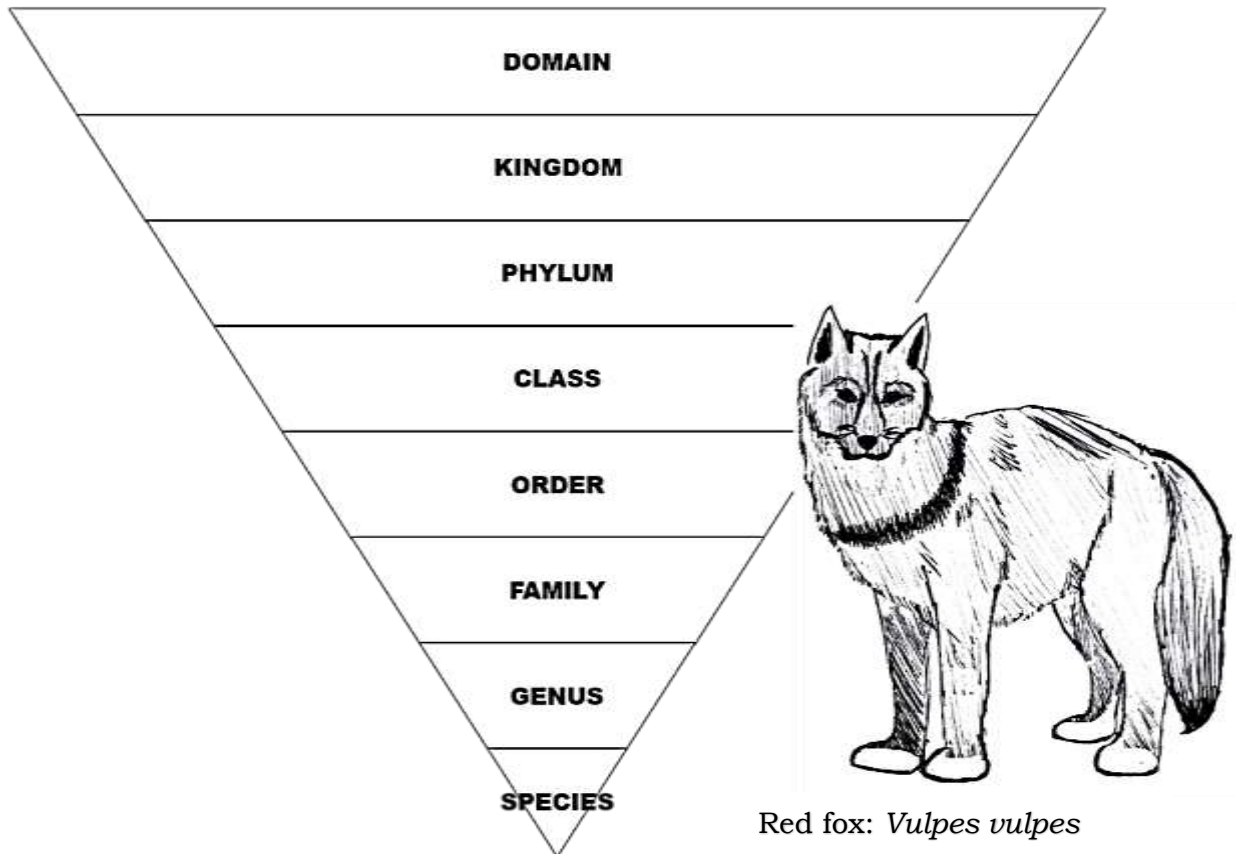
Photo credit: Jubane, Jame-Son G.



What is It

Classifying and Naming Organisms

Scientists group organisms into meaningful classifications. Large groups include many organisms with few similarities. Small groups include few organisms having more similarities. The classifications are categorized into the following hierarchy: domain, kingdom, phylum, class, order, family, genus, and species. Figure 1 below shows an inverted pyramid indicating the hierarchy in descending order.



Illustrated by: Jubane, Jame-Son G.

Figure 1: Hierarchical System of Classification

Domain is the largest category into which organisms are classified. Back then, organisms were only grouped into eukaryotes and prokaryotes. Then scientists came up with the three-domain systems of classification.

Recently, prokaryotes have been divided into two domains namely: Archaea and Eubacteria. The eukaryote group was retained and includes the protists, fungi, plants, and animals.

Kingdom is the taxonomic rank after domain. In the late century 18th century, studies of organisms resulted in only two-kingdom classification system. But with the invention of the microscope and with more evidences gathered about different forms of life, various scientists have proposed three to four, then five, and later six or even eight-kingdom classification.

Here are the six-kingdom classification: Archaeobacteria, Eubacteria, Protist, Fungi, Plant, and Animal kingdoms.

A **phylum** consists of different classes. Each **class** has several orders, and each **order** has different families. A **Family** consists of several genera (sing. genus), with each **genus** being composed of the smallest group of various species.

Species is a group of organisms that can reproduce. This means that only members of an equivalent species can mate and produce fertile offspring. The dog, Waling-Waling (an orchid), Milkfish (local name, Bangus), rice plant, and humans are examples of species.

Each organism has a common name and a scientific name. In Biology, a common name of organism, is also known as a vernacular name, English name, trivial name, country name, popular name, or farmer's name. ~~A name that~~ is based on the normal language of everyday life.

The scientific name based on the binomial system of classification is composed of two names, where the first name as based on its genus and second name refers to the species where the organism belongs. Both names are in Latin or latinized.

Scientific names are written either italicized (e.g., *Panthera leo*) or underlined (e.g., Panthera leo), with only the first letter of the genus written in uppercase.

Fast Facts!

Did you know that scientists classify organisms? These organisms are classified to understand the relationships between them.

Scientists classify organisms based on the three systems: artificial, natural, and phylogenetic system of classification. Phylogenetic is relating to the evolutionary development, history and relationships among individuals or groups of organisms.



Illustrated by: Jubane, Jame-Son G.

Sir Carolus Linnaeus is the Father of Botany, the scientific study of plants, including their structure and economic importance. He was the first to name and classify plants and other organisms.

The Three Domains of Life

Archaea Domain: Kingdom Archaeobacteria

Organisms of this kingdom are all microscopic, meaning we cannot see them with our unaided eyes. Archaeobacteria has no nucleus and even organelles. Their genetic materials float freely in cytoplasm. They live and settle in diverse places, some even in the most extreme environments. Methanogens, halophiles, and thermophiles are examples of Archaeobacteria. Methanogens can survive in places where there is little to no oxygen, like the digestive tracts of animals and ponds. An important characteristic of this group is they produce methane gas. Halophiles are adapted to very salty environments. Examples of halophiles are *Halococcus dombrowski* and *Halobacterium salinarium*. Thermophiles can live in places with high temperature. These include volcanic hot springs with temperatures from 80 to 110°C.

Bacteria Domain: Kingdom Eubacteria

Members of Eubacteria are unicellular and microscopic. They do not have true nucleus and organelles and are regarded as the true bacteria. Their cell walls are made of peptidoglycan, the basic unit of the cell wall in bacteria, which confers mechanical rigidity to the cell, protects the cytoplasmic membrane and determines the cell form.

Members of Domains Eubacteria and Archaeobacteria are called prokaryotes because of they lack a true nucleus and membrane-bound organelles.

Domain Eukarya

Eukarya consists of organisms that have a true nucleus and structures called organelles that are surrounded with by membranes. Organisms in the domain Eukarya keep their genetic material in a nucleus and include the plants, animals, fungi, and protists.

Kingdom Protista

Members of Kingdom Protista come from unrelated ancestors thus, this grouping is referred to by biologists as an artificial grouping. They can be classified into three groups: plant-like, animal-like, and fungi-like protists. The grouping is based on their method of obtaining energy and ability to locomote.

Photoautotrophs are like plants in that they have chlorophyll, and they can produce their own food through photosynthesis. This group includes the algae, dinoflagellates, and euglenoids. These protists are generally considered as plant-like. Some of them have the ability to locomote (locomotory) like dinoflagellates that can cause red tide, while others are non-locomotory like the algae.

Heterotrophs are those that obtain energy from organic matter by feeding on other organisms. These include radiolarians, foraminiferans and amoeba. Some heterotrophic protists can also locomote by means of pseudopodia, cilia, or flagella,

hence, they are referred to as animal-like protists because of their heterotrophic and locomotory nature. Examples of these include *Amoeba* which uses pseudopodia to locomote, *Paramecium* that uses cilia, and *Trypanosoma* that uses flagella. A group of protists called Sporozoa has members that are non-locomotory because of the absence of any locomotory structure. An example of this is *Plasmodium*, four species of which are known causative agents of malaria.

The third group of protists are the fungi-like protists that are classified based on their similarity in characteristics to fungi in that they reproduce by forming spores and are considered as saprotrophic. Saprobies or saprotrophs are organisms that derive energy from organic matter, hence, they are considered as heterotrophs, but they perform extracellular digestion by releasing enzymes into dead organic matter and absorbing the products of digestion. Examples of this are slime molds and water molds. Both are known decomposers in their habitats.

Domain Eukarya: Kingdom Fungi

Fungi are eukaryotic, non-vascular, non-motile and heterotrophic organisms. They may be unicellular or filamentous. They reproduce by means of spores and exhibit the phenomenon of alternation of generation. Fungi lack chlorophyll and hence cannot perform photosynthesis.

Volvariella sp. (paddy straw mushroom) and *Pleurotus sajor caju* (oyster mushroom) are examples of edible fungi. Yeast is the type of fungi which exist as the single cell, reproduce asexually, and are used in food, beverages, etc. On the other hand, molds are multicellular with hyphae that makes the vegetative form of the fungus called mycelium and may function for the absorption of nutrients. They can reproduce sexually or asexually; used in making antibiotics, and cheese, etc.

The fungi help in decomposing organic matter, play a big part in material biodegradation, and enable recycling of materials in all ecosystems. The enzymes and mycotoxins can also inhibit the growth of other molds and microorganisms. Decomposition is made faster using *Trichoderma harzianum*. An important mold to mention is *Penicillium notatum*, which is used in making **penicillin**, a drug that kills disease-causing bacteria.

Domain Eukarya: Kingdom Plantae

You knew earlier that plants belong to the eukaryote group. They are multicellular and because they have chlorophyll, they can make their own food. Plants consist of two big groups: those which do not have tissues to transport water and food (**nonvascular**) and those that have such transport system (**vascular**). Some examples of vascular plants include maize, mustard, rose, cycad, ferns, clubmosses, grasses, etc. Some examples of non-vascular plants include moss, liverwort, and hornwort.

Gymnosperms

These are seed plants composed of those which bear seeds contained in cones and those inside a protective layer of tissue. Plants with seeds borne in cones are called gymnosperms. Examples of gymnosperms are the conifers (e.g., Pine trees, cypresses), cycads, ginkgoes, and gnetophytes.

Angiosperms

They are also called flowering plants since flowers, as well as fruits, are involved in their reproduction and development.

Eukarya Domain: Kingdom Animalia

Animals are divided in two major groups, the **invertebrates** and **vertebrates**. Invertebrates are those that do not possess a vertebral column or backbone while Vertebrates are those where vertebral column or backbone is present.

Invertebrates: Sponges

The simplest animals belong to Phylum Porifera. They live in shallow and deep oceans. The young of sponges are motile, while adults are attached to solid materials like rocks. The body of a hard sponge is supported by a “skeleton” composed of spicules, that are made of glasslike silica or calcium carbonate. A network of protein fibers supports soft sponges. This is the one used for bathing and washing.

Invertebrates: Cnidarians

Members of Phylum Cnidaria consist of animals whose tentacles contain stinging cells called nematocysts. These poison-filled structures are used for defending themselves and for capturing their prey and food. Once released, this poison can be painful to their enemies. Examples of these are jellyfish or sea jellies, corals, and sea anemones. Corals form colonies of various colors and secrete a hard skeleton. These accumulate to form coral reefs which are of great importance as they are one of the world's most productive ecosystems.

Invertebrates: Flatworms

They belong to Phylum Platyhelminthes (in Greek platys means flat, helminth means worm). As their names suggest, they are flat and ribbonlike organisms. Flatworms are found in freshwater, in wet places and marine waters. They include the free-living or nonparasitic worms, the parasitic flukes, and the tapeworms group. Planaria is an example of a free-living flatworm. Tapeworms are ~~also~~ parasitic flatworms like flukes with incomplete digestive system.

Invertebrates: Roundworms

These are members of Phylum Nematoda. Compared to flatworms, roundworms, also known as nematodes, have long, cylindrical, and slender bodies. A roundworm has a complete digestive system, which includes both a mouth and an anus. This is a significant difference from the incomplete digestive system of flatworms. The roundworm digestive system also includes a large digestive organ known as the gut. Digestive enzymes that start to break down food are produced here. There is no stomach, but there is an intestine which produces enzymes that help absorb nutrients. The last portion of the intestine forms a rectum, which expels waste through the anus. Example of roundworms. *Ascaris lumbricoides* (also called human roundworm), which is the most common roundworm infection, and affects as many as one billion people worldwide.

Invertebrates: Segmented Worms

The third group of worms among the animal phyla belongs to Phylum Annelida, also called annelids. These worms are characterized by a segmented or repeated body parts which enable them to move easily with flexibility. Segmented worms include the common earthworm and leeches. They have a digestive system, nervous system, and circulatory system.

Invertebrates: Mollusks

These soft-bodied invertebrates are mostly covered with shells. They have complex respiratory, reproductive, circulatory, digestive, and excretory systems functioning together for their survival. Mollusks consists of three classes: The Gastropods, Bivalves and Cephalopods. Gastropods, also called univalves and has only one shell. They are mostly marine and freshwater and terrestrial members. Bivalves are mollusks consists of two shells attached to each other. Some bivalves are attached to rocks while others remain in the sand or mud. The cephalopod group includes the squid and cuttlefish with internal skeleton. The chambered nautilus has external skeleton while the octopus is shell-less.

Invertebrates: Echinoderms

Diverse marine invertebrates that include sea urchins, sand dollars, star fish, sea cucumbers and brittle stars. They are recognizable by their pentameric radial symmetry. They have a star-like appearance and are spherical or elongated. They are exclusively marine animals and organisms are spiny-skinned. They also exhibit organ level of organization. Examples of an echinoderm include a starfish, a sand dollar, a brittle star, a sea urchin, and a sea cucumber.

Invertebrates: Arthropods

Phylum Arthropoda is considered the most successful of all animal phyla as they are present in almost all types of habitats. Arthropods walk or crawl, some can fly, while others swim in salty and freshwaters. They have segmented body with a head, a thorax, and abdomen segments. Appendages on at least one segment. A nervous system and a hard exoskeleton made of chitin, which gives them physical

protection and resistance to drying out. Examples of arthropods are Chelicerata: horseshoe crabs, spiders, scorpions, sea spiders and mites. Myriapoda: millipedes, centipedes, pauropods and symphylans (known as glasshouse symphylans or garden centipedes) Crustacea: brine shrimp, barnacles, lobsters, crabs, shrimp and remipedes.

Vertebrates: Chordates

Animals that belong to Phylum Chordata have four characteristics that are present in any stages in their life cycle. These are the notochord, the dorsal hollow nerve cord, gill slits, and a post-anal tail. Notochord serves as a source of midline signals that pattern surrounding tissues and as a major skeletal element of the developing embryo.

a. Fishes

Fishes can be classified into either Class Osteichthyes or Class Chondrichthyes. Include Chondrichthyes is a class of jawed fishes having a cartilaginous skeleton. The class includes a diverse group of fishes including sharks, rays, skates, and chimaeras. They are mostly marine fishes. The other group of fishes are bony fishes, which are included in the class Osteichthyes. These are cold-blooded animals with backbone and are found in either saltwater or freshwater. Most possess scales for protection, a paired fin for movement and gills for gas exchange. Fishes may lay eggs to reproduce or give birth to live young.

b. Amphibians

Class Amphibia refers to cold-blooded animals that live part in water and part on land, from which amphibians got their name. Most lay small, shell-less eggs surrounded by jellylike substance in wet places or in water. These hatch into larvae with gills and tails. The species in this group include frogs, toads, salamanders, and newts. All can breathe and absorb water through their very thin skin. Amphibians also have special skin glands that produce useful proteins.

c. Reptiles

Class Reptilia include cold-blooded animals that exhibit more adaptations for living on land. They lay eggs with shells to protect them from drying up. They even have smooth or rough scales that cover their body to minimize loss of water. Some reptiles have smooth scales like lizards and snakes, while others have rough scales like crocodiles and alligators. Alligators live in freshwater and are only found in North and South America. They include crocodiles, snakes, lizards, turtles, and tortoises.

d. Birds

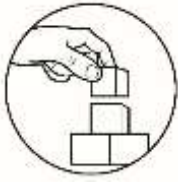
Birds belong to Class Aves, and most are adapted to fly. Their adaptation for flight includes wings and feathers, large flight muscles attached to their breastbone, and reduced bone weight. Some birds are warm-blooded, while others are cold-blooded. Flightless birds are birds which cannot fly. They rely on their ability to run or swim and have evolved from their flying ancestors. These are Penguin, Ostrich, Kiwi, Kakapo and Cassowary.

e. Mammals

Class Mammalia differ from other animals because they have mammary glands that produce milk to nourish their young and most have hair or fur. They inhale air, have four-chambered hearts and are warm-blooded. Most of them also give birth to live young and care for them (Campo et al. 2013, 228-264).

Table 1: Example of how organisms are classified.

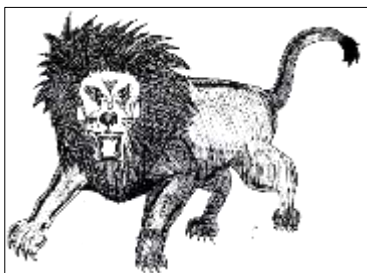
Category	Domesticated Cat	Dog	Bangus	Malunggay	Pineapple
Domain	Eukarya	Eukarya	Eukarya	Eukarya	Eukarya
Kingdom	Animalia	Animalia	Animalia	Plantae	Plantae
Phylum	Chordata	Chordata	Chordata	Vascular	Magnoliophyta
Class	Mammalia	Mammalia	Actinopterygii	Dicotyledon	Monocotyledon
Order	Carnivora	Carnivora	Gonorynchiformis	Brassicales	Poales
Family	Felidae	Canidae	Chanidae	Moringaceae	Bromeliaceae
Genus	<i>Felis</i>	<i>Canis</i>	<i>Chanos</i>	<i>Moringa</i>	<i>Ananas</i>
Species	<i>catus</i>	<i>familiaris</i>	<i>chanos</i>	<i>olifera</i>	<i>comosus</i>



What's More

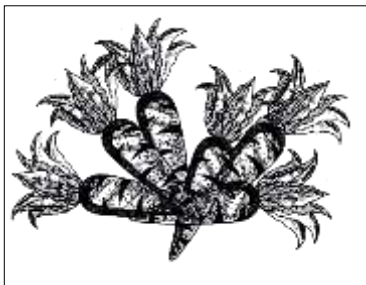
Activity 3. Let us Classify!

Directions: Below are pictures of organisms with incorrect order of levels of taxonomic classifications beside each. Complete the table below by indicating the correct order of levels of classifications for each of these organisms. Write your answers on a separate sheet of paper.



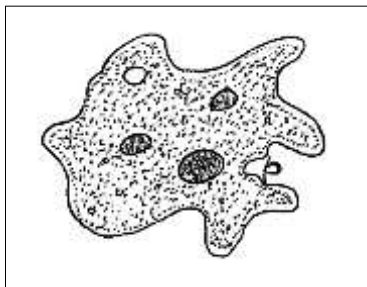
Illustrated by: Jubane, Jame-Son G.

Mammalia (a mammal under chordata)
Panthera (a mammal under Felidae)
Animalia (a kingdom under Eukarya)
Panthera leo (scientific name of a lion under the genus)
Chordata (a mammal under Animalia)
Felidae (a mammal under Carnivora)
Carnivora (a mammal under Mammalia)
Eukarya (The domain, possesses with true nucleus)



Illustrated by: Jubane, Jame-Son G.

Daucus carota L. (scientific name of a carrot)
Magnoliophyta (a plant under Kingdom Plantae)
Eukarya (The domain, possesses with true nucleus)
Magnoliopsida (a seed plant under Magnoliophyta)
Daucus (a seed plant under Apiaceae)
Plantae (a kingdom under Eukarya)
Apiales (a seed plant under Magnoliopsida)
Apiaceae (a seed plant under Apiales)

















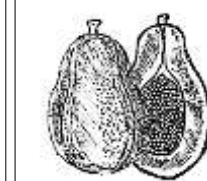





Illustrated by: Jubane, Jame-Son G.

Amoebidae (an amoeba under Amoebida)
Amoebozoa (an amoeba under Protista)
Eukarya (The domain, possesses with true nucleus)
Amoebida (an amoeba under Tubulinea)
Amoeba proteus (scientific name of amoeba)
Protista (a kingdom under Eukarya)
Tubulinea (an amoeba under Amoebozoa)
Amoeba (an amoeba under Amoebidae).

Classifications	Lion	Carrot	Amoeba
Domain			
Kingdom			
Phylum			
Class			
Order			
Family			
Genus			
Species			

Activity 4. Let's Do It By Kingdom and Class!

Directions: Classify the following organisms according to their kingdom in Table 1 and class in Table 2. Write your answers on a separate sheet of paper.

Algae 	Blue ternate 	Cabbage 	Cactus 	Dolphin 
Eagle 	Human 	Fly agaric 	Fox 	Frog 
Lion 	Monitor lizard 	Oyster mushroom 	Orchid 	Papaya 
Rabbit 	Rose 	Shark 	Snake 	Toad 

Illustrated by: Jubane, Jame-Son G.

Table 1: Kingdom Animalia, Kingdom Plantae and Kingdom Protista

Kingdom Animalia	Kingdom Fungi	Kingdom Plantae	Kingdom Protista
1.	1.	1.	1.
2.	2.	2.	
3.		3.	
4.		4.	
5.		5.	
6.		6.	
7.			
8.			
9.			
10.			
11.			

Table 2: Classes under the Phylum Chordata (animals with backbone).

Mammalia	Reptilia	Amphibia	Aves (Birds)	Fish
1.	1.	1.	1.	1.
2.	2.	2.		
3.				
4.				
5.				



What I Have Learned

Activity 5. Filling in the Blanks!

Directions: Complete the statement by writing the correct word or phrase in the blank. Write your answer on a separate sheet of paper.

- _____ is a type of protist that has pseudopodia for movement. These include radiolarians, foraminiferans and amoeba.
- _____ are called flowering plants since flowers, as well as fruits, are involved in their reproduction and development.
- Microscopic organisms such as Methanogens, halophiles, and thermophiles that live in various places, some even in the most severe environments are called _____.
- Members of _____ are unicellular and microscopic organisms, referred to as the true bacteria and are usually called the “bacteria” group.

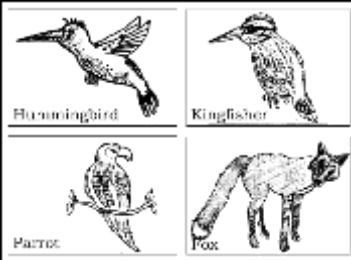
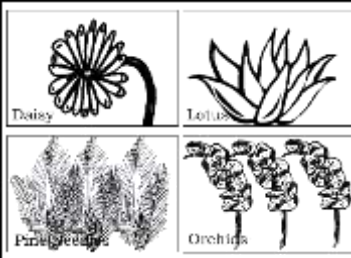
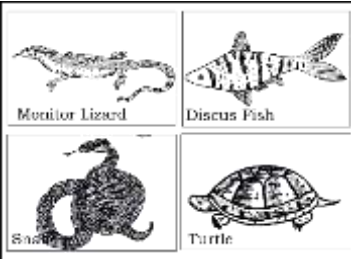
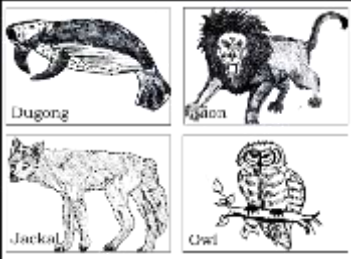
5. This _____ kingdom consists of two big groups: those which do not have tissues to transport water and food (nonvascular) and those that have such transport system (vascular).
6. The Animal Kingdom consists of two major groups, the invertebrates and vertebrates. Invertebrates lack _____ which is present in vertebrates.
7. This means “double life” from which _____ got their name. This refers to animals that live part in water and part on land.
8. The seed plants are composed of those which bear seeds contained in cones and those inside a protective layer of tissue. These plants are classified as _____.
9. These are soft-bodied invertebrates with most of them covered by a shell. Animals with these characteristics are called _____.
10. _____ relates to the evolutionary development, history, and relationships among individuals or groups of organisms.



What I Can Do

Activity 6. One Out!

Directions: Study each set of pictures. Determine which organism does **NOT** belong to the group and state your reasons in the space provided. Write your answers on a separate sheet of paper.

Groups of Organisms	Organism which does not belong to the group	Reason why the organism does not belong to the group
1. 		
2. 		
3. 		
4. 		

Illustrated by: Jubane, Jame-Son G.

Scoring Rubric

Points	Descriptions
3	Discussions do not have misconceptions and with complete scientific evidence.
2	Discussions do not have misconceptions and with incomplete scientific evidence.
1	Discussions have misconceptions and with incomplete scientific evidence.
0	No discussions.



Assessment

Directions: Choose the letter of the correct answer. Write your answers on a separate sheet of paper.

- In which kingdom do organisms without true nucleus and organelles that cannot live in an extreme environment belong?
 - archaea
 - bacteria
 - fungi
 - protista
- Which of the following species belong to a fungi group?
 - Yeast
 - Panthera leo*
 - Saccharomyces rouxii*
 - Pleurotus sajor caju*
 - I and II
 - II and III
 - III and IV
 - I, III and IV
- Which vertebrates can live both on land and in water?
 - Amphibians
 - Birds
 - Fishes
 - Mammals
- Which group is considered as the most successful of all animal phyla because they are present in almost all types of habitats?
 - Phylum Annelida
 - Phylum Chordata
 - Phylum Molluska
 - Phylum Arthropoda

5. Which group of protists possess chlorophyll and can produce their own food?
- A. plant-like
 - B. animal-like
 - C. fungi-like
 - D. protist-like
6. The following are direct uses and importance of fungi in industry and community **EXCEPT**
- A. Use in making penicillin
 - B. Promote growth of the plant
 - C. Use as ingredients in making bread
 - D. Help in decomposition of organic materials
7. Which statement below BEST explains why plants belong to domain Eukarya?
- A. Their cells are composed of true nucleus and organelles.
 - B. Plants are autotrophs and they can make their own food.
 - C. They are composed of organelles but do not possess a true nucleus.
 - D. Plants are composed of true nucleus in their cells but without organelles.
8. Which two big groups of plants are classified in terms of food and water transportation?
- A. vascular and nonvascular
 - B. gymnosperms and angiosperms
 - C. seed-bearing and cone-bearing plants
 - D. flowering plants and non-flowering plants
9. Mr. James discovered a new species. It has scales, beak, and feathers. Which class does the new species belong according to the Linnaean Hierarchical System of Classification?
- A. aves
 - B. fish
 - C. mammal
 - D. reptile
10. Which statement BEST differentiates the characteristics of mammals from reptiles?
- A. Mammals are cold-blooded while reptiles are warm blooded.
 - B. Mammals have hair or fur while reptiles possess scales and wings.
 - C. Mammals possess mammary glands to feed their young while reptiles do not.
 - D. Mammals do not have hair or fur and they possess mammary glands to feed their young while reptiles possess scales and lay eggs.
11. Which is the correctly written scientific name of the lion?
- A. Panthera Leo
 - B. *Panthera leo*
 - C. **Panthera leo**
 - D. Panthera Leo

12. Which of the following species belong to the same group?
- I. Leopard II. Lion III. Parrot IV. Bear
- A. I, II and III C. I, III and IV
B. I, II and IV D. II, III and IV
13. Which of the following is the common characteristic of fishes, birds, mammals, reptiles, and amphibians?
- E. They are vertebrates.
F. They are invertebrates.
G. They are all warm-blooded.
H. They possess mammary glands.
14. Which statement BEST describes the difference between angiosperm and gymnosperm?
- A. Gymnosperms are seed-bearing plants while angiosperms are cone bearing plants.
B. Gymnosperms are non-flowering plants while angiosperms are flowering plants.
C. Gymnosperm are cone bearing plants and angiosperms are seed bearing plants.
D. Gymnosperms are flowering plants while angiosperms are non-flowering plants.
15. Which arrangement reflects the Linnaean Hierarchical System of Classification in ascending order?
- A. species-genus-family-order-class-phylum-kingdom-domain
B. species-phylum-genus-species-class-order-family-domain
C. family-domain-phylum-genus-species-class-order-kingdom
D. kingdom-domain-phylum-genus-species-class-family-order



Additional Activities

Activity 7. Let us Compare!

Directions: Study the figure below and answer the question that follows. Write your answer on a separate sheet of paper.



Illustrated by: Jubane, Jame-Son G.

Question: At what hierarchical classification do discus fish and dog started to differ? Explain your answer.

Scoring Rubrics

Points	Descriptions
3	Discussions do not have misconceptions and with complete scientific evidence.
2	Discussions do not have misconceptions and with incomplete scientific evidence.
1	Discussions have misconceptions and with incomplete scientific evidence.
0	No discussions.



Answer Key

What I Know

1. B
2. D
3. D
4. A
5. D
6. D
7. D
8. A
9. B
10. A
11. C
12. D
13. C
14. D
15. C

What's In Activity 1: Four Pics One Word

1. AMPHIBIANS
2. MAMMALS
3. REPTILES
4. AVES

What's New

Act. 2 Writing a Scientific Name

1. *Carica papaya*
2. *Citroea ternatea*
3. *Protoreaster nodosus*
4. *Ophiotrix fragilis*
5. *Crescentia cujete*
6. *Pseudorhombus dupliciocoellatus*
7. *Homo sapiens*
8. *Artocarpus heterophyllus*
9. *Theobroma cacao*
10. *Musa acuminata*

What's More

Activity 3:

Lion

Domain: Eukarya
Kingdom: Animalia
Phylum: Chordata
Class: Mammalia
Order: Carnivora
Family: Felidae
Genus: *Panthera*
Species: *Panthera leo*

Carrot

Domain: Eukarya
Kingdom: Plantae
Phylum: Magnoliophyta
Class: Magnoliopsida
Order: Apiales
Family: Apiaceae
Genus: *Daucus*
Species: *Daucus carota*

Amoeba

Domain: Eukarya
Kingdom: Protista
Phylum: Amoebozoa
Class: Tubulinea
Order: Amoebida
Family: Amoebidae
Genus: *Amoeba*
Species: *Amoeba proteus*

Activity 4: Let's Do It By Kingdom and Class! (The answers could be interchanged)

Kingdom Animalia
Dolphin, Eagle, Human, Fox, Frog, Monitor lizard, Rabbit, Shark, Snake, Toad

Kingdom Protista
Algae

Kingdom Fungi
Fly agaric

Kingdom Plantae
Oyster mushroom, Blue pea, Cabbage, Cactus, Orchid

Mammalia
Papaya, Rose

Dolphin, Human, Fox, Lion, Rabbit, Reptilia
Snake

Monitor Lizard, Amphibia
Toad and Frog

Aves
Eagle

Fish
Shark

What I Have Learned

Activity 5: Fill in the Blank

1. Heterotrophs
2. Angiosperms
3. Kingdom Archaeabacteria
4. Kingdom Eubacteria
5. Plant Kingdom
6. Backbone
7. Amphibian
8. Gymnosperms
9. Mollusks
10. Phylogenetic tree

What I Can Do! Activity 6: One Out!

1. Fox (*Fox is a mammal.*)
2. Pine needles (*Pine needles are not flowering plants.*)
3. Discus fish (*Discus fish is a fish not a reptile.*)
4. Owl (*Owl is a bird not a mammal.*)

Assessment

1. B
2. D
3. A
4. D
5. C
6. B
7. A
8. A
9. A
10. C
11. B
12. B
13. A
14. B
15. A

Additional Activities

Activity 7: Let us Compare!

Possible Answer: Dog and discus fish started to differ in a class group because discus fish is not a mammal unlike dog, rabbit, cat, fox and jackal.

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