

Humans supposedly are the most advanced and intelligent living things on Earth. Armed with knowledge and understanding we must **Try** to do our best to care for our **Ecosystem**, the Planet Earth our **home**. Naturally we are curious about all life on Earth and specifically how we are related to other living things. Understanding the **Code of Classification** may help us unlock the secrets to understanding this important relationship.

Code #1

Scientists use **Taxonomy**, a *system of organizing and naming of all life on earth using a universal scientific language which is written in Latin*. Create by Carl Linnaeus from Sweden in the 1700's. Today all scientists use this language to communicate about different organisms. This is so when scientists in Canada discuss organisms with scientists in Florida, they know if they are discussing the same organism. *Felis concolor* or cougar in Florida may be called locally a puma, but it is the same species as what we call mountain lion in B.C.

Code #2

Place living things in order from simple to more complicated life forms. This order helps us understand relationships between living things. Let's look at what bears and spiders share in common and how they are different. **Similarities:** Both are animals that are carnivores and eat meat. Both have furry bodies. To some extent, both are scary. Both are predators with long fangs. **Differences:** Spiders have eight legs while bears have two. Spiders lay eggs and bears give birth to live young. Spider babies require little care from their mothers, baby bears stay with their mothers for up to 3 years. Spiders have no teeth and eat their prey by injecting a chemical that dissolves their insides and then they slurp up the remains, while bears tear and chew up their food. Bears are large animals with an advanced brain.

Code #3

Living things are classified into various categories from a few more general groups to many specific species. To remember these classification groups, memorize this saying, "Kids play cool or fun games, sweet". As an example below is the classification of an animal we are all familiar with, *Felis domesticus* or the common house cat:

Kingdom	<i>Animalia</i> (Animal)
Phylum	<i>Chordata</i> (Animals with spinal cord or vertebrates)
Class	<i>Mammalia</i> (Animals with mammary glands used to feed young milk)
Order	<i>Carnivora</i> (Animals with teeth designed to tear and eat meat)
Family	<i>Felidae</i> (Cat family – all members retract claws and have rough tongues)
Genus	<i>Felis</i> (shortened name for the Cat Family)
Species	<i>domesticus</i> (domestic house cat species- species can mate and produce offspring that can also reproduce)



Code #4

Get the Keys to the Kingdoms. Natural ecosystems consist of living organisms from the five Kingdoms interacting with each other usually through the food chain and the non-living elements (sun, soil, air and water) in the environment. Non-living elements set the stage for the organisms that live there. From the 5 Kingdoms of Life on Earth there are:

1. Over 4,000 different kinds of bacteria in the Kingdom **Monera**
2. 80,000 different kinds of **Protista** like algae and amoebas
3. 72,000 types of **Fungus**
4. 270,000 **Plants**
5. In the **Animal** Kingdom 1.272 million types of invertebrates like spiders and insects and 52,000 animals with vertebrates or backbones.

From the **5 Kingdoms – 1) Monera, 2) Protista, 3) Fungi, 4) Plants, and 5) Animals**, there are 1.75 million species classified with an estimated 14 million still waiting to be discovered! Many of these organisms may unlock the secrets to cures for illnesses like cancer and Alzheimer, new crops for food, replacements for fossil fuels, or lurking diseases and fungus waiting to infect animals like the bird flu.

It is important to know about classification if you plan to work in the area of science so that you can communicate with other scientists and contribute to each others' discoveries. By understanding classification of organisms from more general to more complex, we get a glimpse into how organisms adapt and change due to environmental conditions. This may help us understand better changes to the earth like global warming and species adaptation to this.



Characteristics of Kingdoms

Characteristics	Role in Ecosystems	Examples
<p>1. Monera – single celled without a nucleus. Most fix or ingest carbon. Date back 4 billion years. Can survive in extreme conditions. Made our atmosphere aerobic so we can breath air.</p>	<p>Decompose organic material. Fix carbon and return oxygen to the air. Some bacteria can be used to make medicine.</p>	<p>Bacteria. Virus (scientists are not sure where to put viruses since they are unique organisms that depend on a host cell to live).</p>
<p>2. Protista – single celled. Colonial and rarely multi-celled organisms. 60,000 different species in this Kingdom. <i>Plant-like</i> protists can make their own food. e.g. algae. <i>Animal-like</i> protists ingest bacteria as food e.g. paramecium. Much larger than bacteria, very mobile swimming using long hair-like flagella that whips around.</p>	<p>Base of the marine food web. Major oxygen producers on Earth. Consumer of bacteria. Many have symbiotic relationships with other organisms.</p>	<p><i>Plant-like</i> protists include algae, diatoms. <i>Animal-like</i> protists include protozoa and paramecium.</p>
<p>3. Fungi – organisms lack chlorophyll and can't make their own food. Parasitic and can break down anything that is organic e.g. food, leather shoes, dead animals, grass clippings. Digest food outside of their bodies and absorb the food and nutrients through their cells. Live on the land and in the water. Some fungi are symbiotic and help other organisms that help them like some tree roots and lichen.</p>	<p>Help to break down nature's garbage. Food source – mushrooms and yeasts that help bread rise. Can break down various forms of toxic pollutants. Decomposers in the food chain. Some fungi such as certain lichens break down rock to create soil. Biological monitors for clean air. e.g. lichen. Used to make penicillin.</p>	<p>Examples of Fungi:</p> <ul style="list-style-type: none"> ▪ Mushrooms ▪ Bracket fungus ▪ Yeast ▪ Mold ▪ Lichen
<p>4. Plants – only organism that makes its own food through photosynthesis making them the producers in the food chain. Plant cells contain chloroplast essential for photosynthesis. Multicellular and found in water and on land.</p>	<p>Recycle water by taking it up through roots and giving it off to the air. Used for medicines. Food for many organisms. Consume CO₂ and produce oxygen. Create habitats for animals. Provide shade and shelter for animals.</p>	<p><i>Non Vascular plants</i> – mosses, liverworts and hornworts. <i>Vascular plants</i> – horsetails, ferns, gymnosperms (conifer trees), and angiosperms (flowering plants – shrubs, deciduous trees, wildflowers).</p>
<p>5. Animals – multicellular organisms in which the cells create tissues, which are arranged into organs and then into organ systems. Digest food internally. Off spring or young are from egg and sperm cells.</p>	<p>Consumers in the food web so help keep balance on Earth. Provide food for other animals. Used in research. Ability to alter the environment. Dead animals become soil.</p>	<p><i>Invertebrates</i> – e.g. insects, spiders, worms, centipedes, millipedes. <i>Vertebrates</i> – e.g. fish, amphibians, reptiles, birds, mammals.</p>

