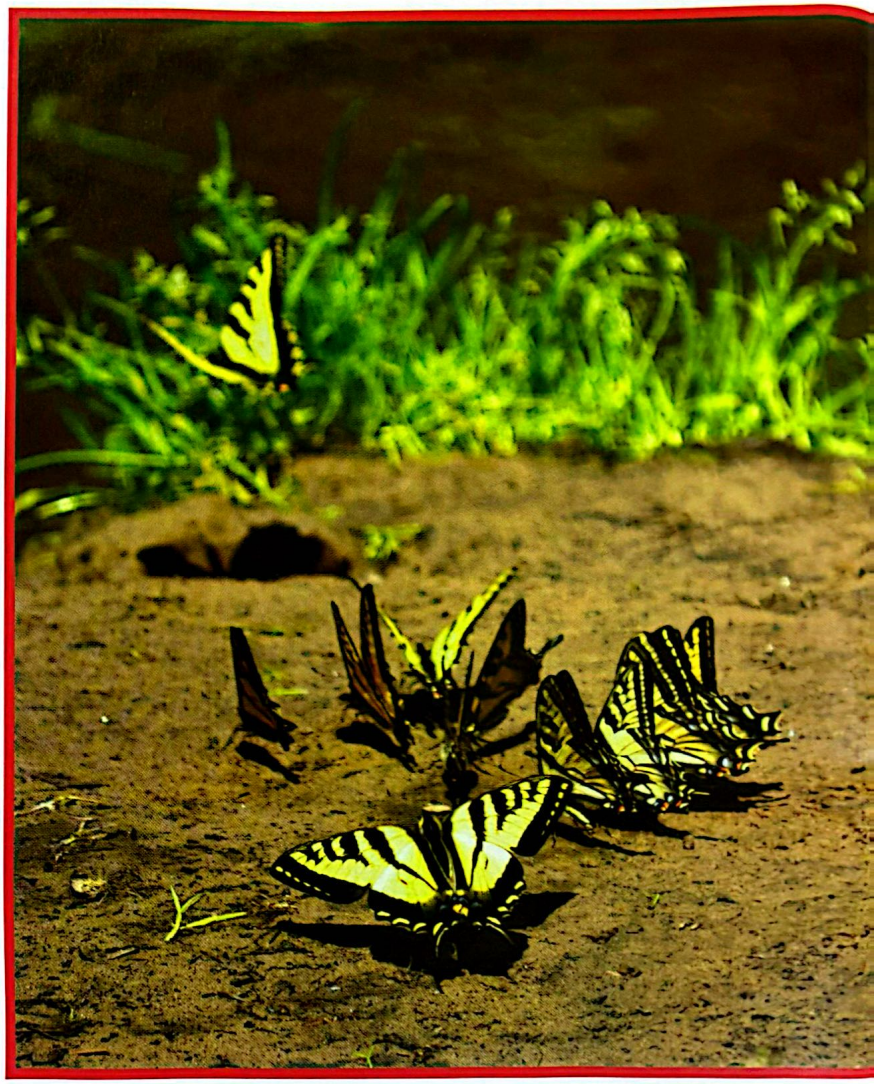
Classifying Living Things

the importance of Classification? helps scientists organize the diversity of life on Earth.

To organize the diversity of life on Earth, why scientists use classification? You realize the importance of classification when you consider how many living organisms there are o this planet.

There is a vast number of species of animals, plants, and other organisms.



The swallowtail butterfly is just one type of butterfly. The butterfly is just one type of insect. It is difficult to realize just how many living things are on the planet.

- There are close to 600 types of swallowtail butterflies.
- There are close to 16,000 types of butterflies, not including moths.
- If you combine the butterflies and moths, there are about 165,000 types.
- There are around 1,000,000 types of known insects. Insects are only one type of arthropods.
- Arthropods are one type of animal and there are 1,075,000 types.
- Animals are only one type of living things. There are close to 1,500,000 types of animals.

There are at least 140,000 species of protista (single-celled organisms), around 70,000 types of fungi, and close to 400,000 types of plants. Can you imagine ho many bacteria there are?!

butterfly → swallowtail (type)

group → insect

Why Classify?

You try it!

Research on the internet who Carl Linnaeus was and what his contribution is to classification.

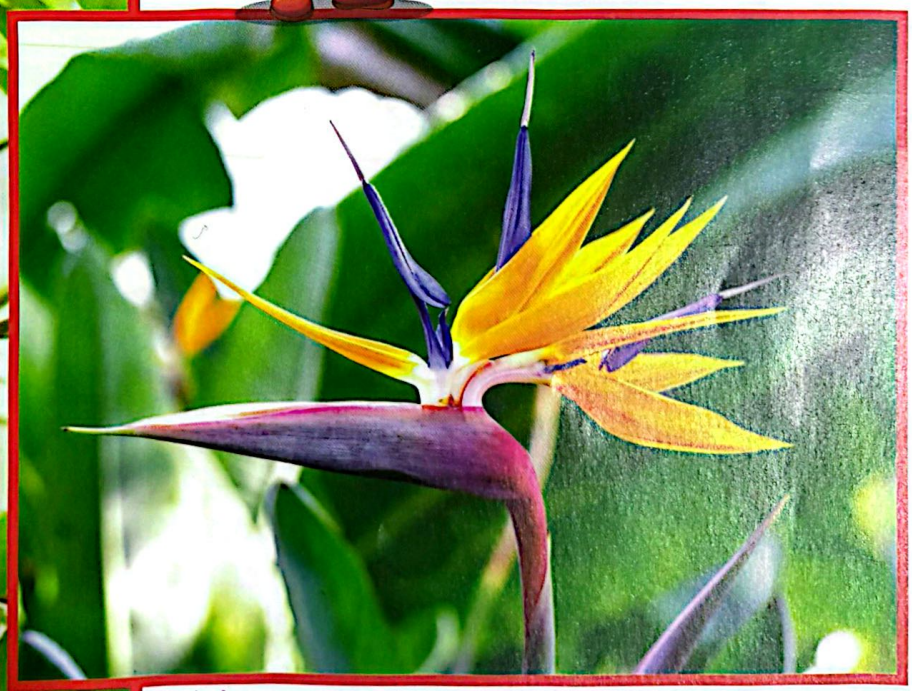
You can easily find what you need when you go shopping, because the markets organize and group things. Bread is in one section, meats are in another, and so on.

Define: Taxonomy is the science of naming and classifying living things. Scientists do this so they can make the process easier.

The Bird of Paradise is a type of bird AND a type of plant. This is an example of living things having the same name. We can't class these two together because they are very different: one is a plant, and the other is a bird. The system that scientists use helps us recognize the difference between the different characteristics in living things.

You Do It!

Find other plants that have animal names.



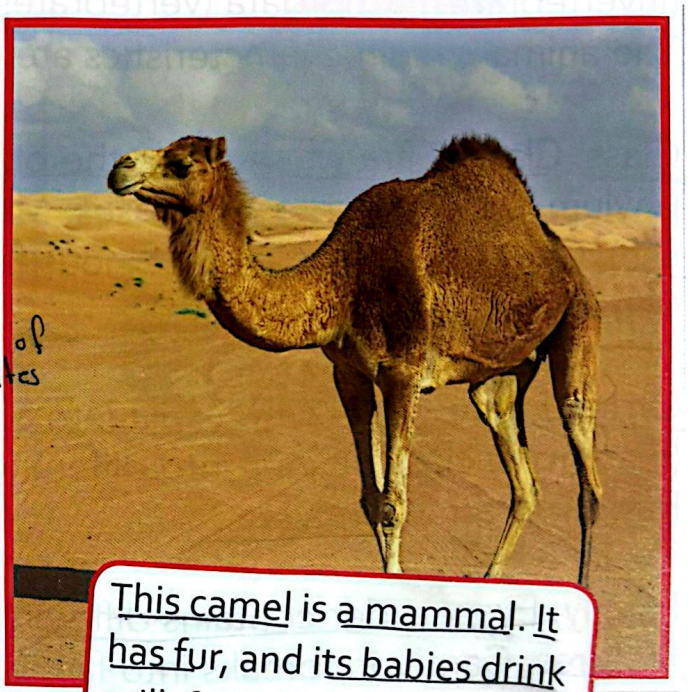
Domain Eukarya → **Kingdom Animalia**

All animals, even humans, are included in Kingdom Animalia. The two groups animals are divided in are invertebrates (they don't have a backbone) and vertebrates (they have a backbone).

Define Animals Animals

Vertebrates are animals that have an endoskeleton (internal skeleton) and a backbone. The backbone is a column of bones called vertebrae. Reptiles, fish, mammals, birds, and amphibians are all vertebrates. Only around 5% of the animal population consists of vertebrates.

examples of vertebrates



This camel is a mammal. It has fur, and its babies drink milk from its body.

Crabs are invertebrates. They live on land and in water. Camphibians)

example

Animals that do not have a backbone are called invertebrates. Some types of invertebrates include worms, insects, sponges, and jellyfish. Invertebrates make up around 95% of the animal population.

Animals are classified even further within these two groups depending on their body structures and what they eat.

This Is How Animals Are Classified.

Kingdom: The five kingdoms that all living organisms are placed in are the following: Animals, Plants, Fungi, Bacteria, and Protista (single-celled organi

Phylum: Forty smaller groups make up the animal kingdom. They are called phylum. Normally, animals are placed into one of five different phyla: Cnidar (invertebrates), Chordata (vertebrates), Arthropods, Mollusca, and Echinoder The animal's main characteristics are what determine which group they go in.

Class: Classes are what divide the phylum group. The Chordata (vertebrates) phylum is divided into six classes: Mammalia (mammals), Actinopterygii (bon fish), Chondrichthyes (cartilaginous fish), Aves (birds), Amphibia (amphibians), Reptilia (reptiles).

Order: Every class is then split into a smaller group called order. The Mamma (mammals) class divides into different groups that include Artigactyla, Primate Rodentia, and Carnivora.

Family: Every order contains different families of animals that have similar features. Carnivora breaks into families that include Mustelidae (weasels), Ursi (bears), Canidae (dogs), and Felidae (cats).

Genus: Every family is divided into a smaller group called a genus. Every genu has animals that are closely related and have similar features. Felis (small cats and domestic cats), Panthera (tigers, leopards, jaguars, and lions), and Puma (panthers/cougars) are some of the genus included in the Felidae (cat) family.

Species: All animal's scientific names are in Latin so that they can be understo all over the world. They contain two words, the first being the genus, and the second word being the species. Every single animal species within the genus named after its individual features and characteristics.

Species contains two words
① genus
the species

You try it!

Search for other classifications on this website:
http://eol.org/pages/328674/overview

Classification of a Tiger:

Kingdom:	Animalia (Animal)
Phylum:	Chordata (Vertebrate)
Class:	Mammalia (Mammal)
Order:	Carnivora (Carnivore)
Family:	Felidae (Cat)
Genus:	Panthera
Species:	Panthera tigris (Tiger)

Classification of an Orangutan:

Kingdom:	Animalia (Animal)
Phylum:	Chordata (Vertebrate)
Class:	Mammalia (Mammal)
Order:	Primates
Family:	Hominidae (Great Apes)
Genus:	Pongo
Species:	Pongo pygmaeus (Orangutan)

Domain Eukarya → Kingdom Plantae

There are over 260,000 species and they are all included in the Kingdom Plantae.

Kingdom Plantae gets broken down into smaller divisions depending on their characteristics. These include:

- tissue structure: divided into vascular and non-vascular plants;
- seed structure: further divided by how they reproduce through spores, covered seeds, or naked seeds;
- stature: divided into herbs, ferns, mosses, trees, vines, and shrubs.

There are at least four classification systems that are in common use. One being the same that is used for animals.

Classification of a Pomegranate:

Kingdom:	Plantae
Phylum:	Tracheophyta
Class:	Magnoliopsida
Order:	Myrtales
Family:	Lythraceae
Genus:	Punica
Species:	Punica granatum L. (pomegranate)

Classification of an Onion:

Kingdom:	Plantae
Phylum:	Tracheophyta
Class:	Liliopsida
Order:	Asparagales
Family:	Amaryllidaceae
Genus:	Allium
Species:	Allium cepa L. (onion)

Domain Eukarya → Kingdom Fungi

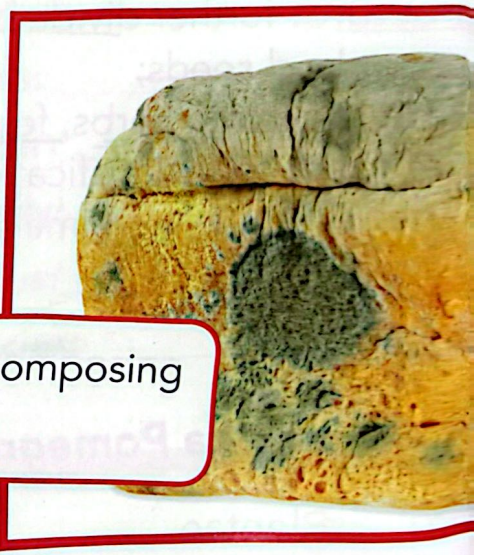
You try it!

Complete the classification
oyster mushroom
Kingdom: ___
Phylum: ___
Class: ___
Order: ___
Family: ___
Genus: ___
Species: Ple
ostre
(Oys

Molds, mushrooms, and yeasts are included in the Kingdom Fungi. Fungi are classified by the way they reproduce, size, and shape. There are at least four classifications that are commonly used.

Yeasts contain only one cell. You can only see a single yeast cell with a microscope.

Mold is a type of fungus that decomposes food.



The mold fungus is decomposing the bread for energy.

Classification of a Shiitake Mushroom:

Kingdom:	Fungi
Phylum:	Basidiomycota
Class:	Agaricomycetes
Order:	Agaricales
Family:	Marasmiaceae
Genus:	Lentinula
Species:	Lentinula edodes (Shiitak

Domain Eukarya → Kingdom Protista

Scientists classify protists depending on how they behave. Sometimes they may act like animals, fungi, or plants. Kingdom Protista is a very diverse kingdom. Most are made up of one cell. Some protists live in large colonies that look like a single organism.

You try it!

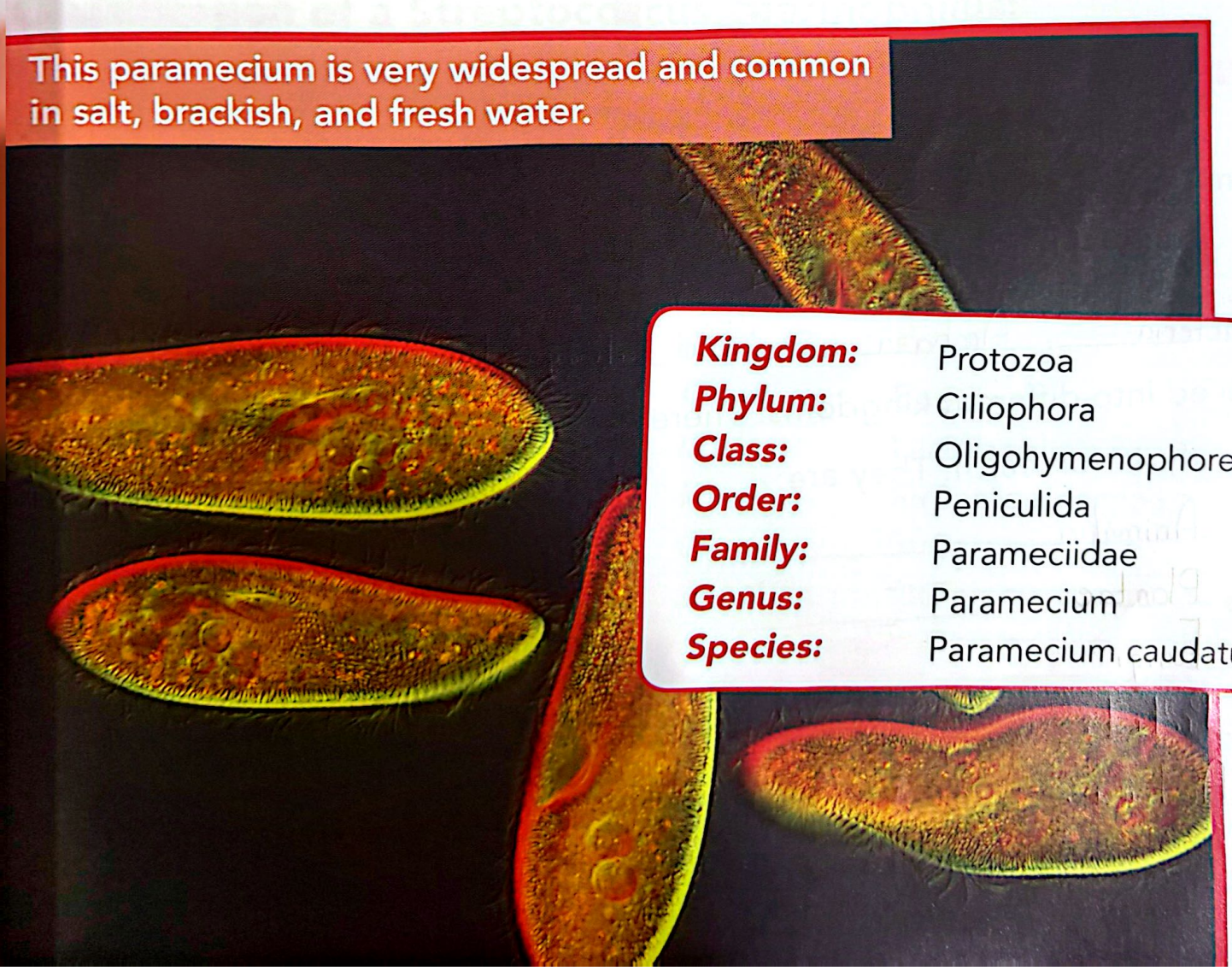
Complete the classification of another protist.

_____:

Kingdom: _____
Phylum: _____
Class: _____
Order: _____
Family: _____
Genus: _____
Species: _____

Draw a protist.

Classification of a Paramecium Caudatum:



This paramecium is very widespread and common in salt, brackish, and fresh water.

Kingdom:	Protozoa
Phylum:	Ciliophora
Class:	Oligohymenophorea
Order:	Peniculida
Family:	Parameciidae
Genus:	Paramecium
Species:	Paramecium caudatum

Activity 2

1 1. Fill in the blanks for dragon fruit and red kangaroo.

dragon fruit	
Kingdom:	_____
Phylum:	Magnoliophyta
Class:	Magnoliopsida
Order:	Caryophyllales
Family:	Cactaceae
Genus:	_____
Species:	Hylocereus undatus

kangaroo	
Kingdom:	Animalia
Phylum:	_____
Class:	Mammalia
Order:	_____
Family:	Macropodidae
Genus:	Macropus
Species:	Macropus rufus

2 Complete the sentence.

All living organisms are first placed into one of three domains: Bacteria, Archaea, and Eukarya. They are then placed into different kingdoms. There are five different kingdoms to classify life on earth. They are:

1. Animalia
2. Plantae
3. Fungi
4. Protista
5. Archaea

Domain Bacteria → **Kingdom Bacteria**

What is microscopic and can be found anywhere? Bacteria! Bacteria (singular: bacterium) even live in humans. They are the majority of living things on Earth. Some are beneficial, and others are harmful. Size, shape, how they get food, and whether they use oxygen or not are the criteria used to classify bacteria. Streptococcus thermophilus is one of the most common bacteria.

You try it!

Complete the classification of another bacterium.

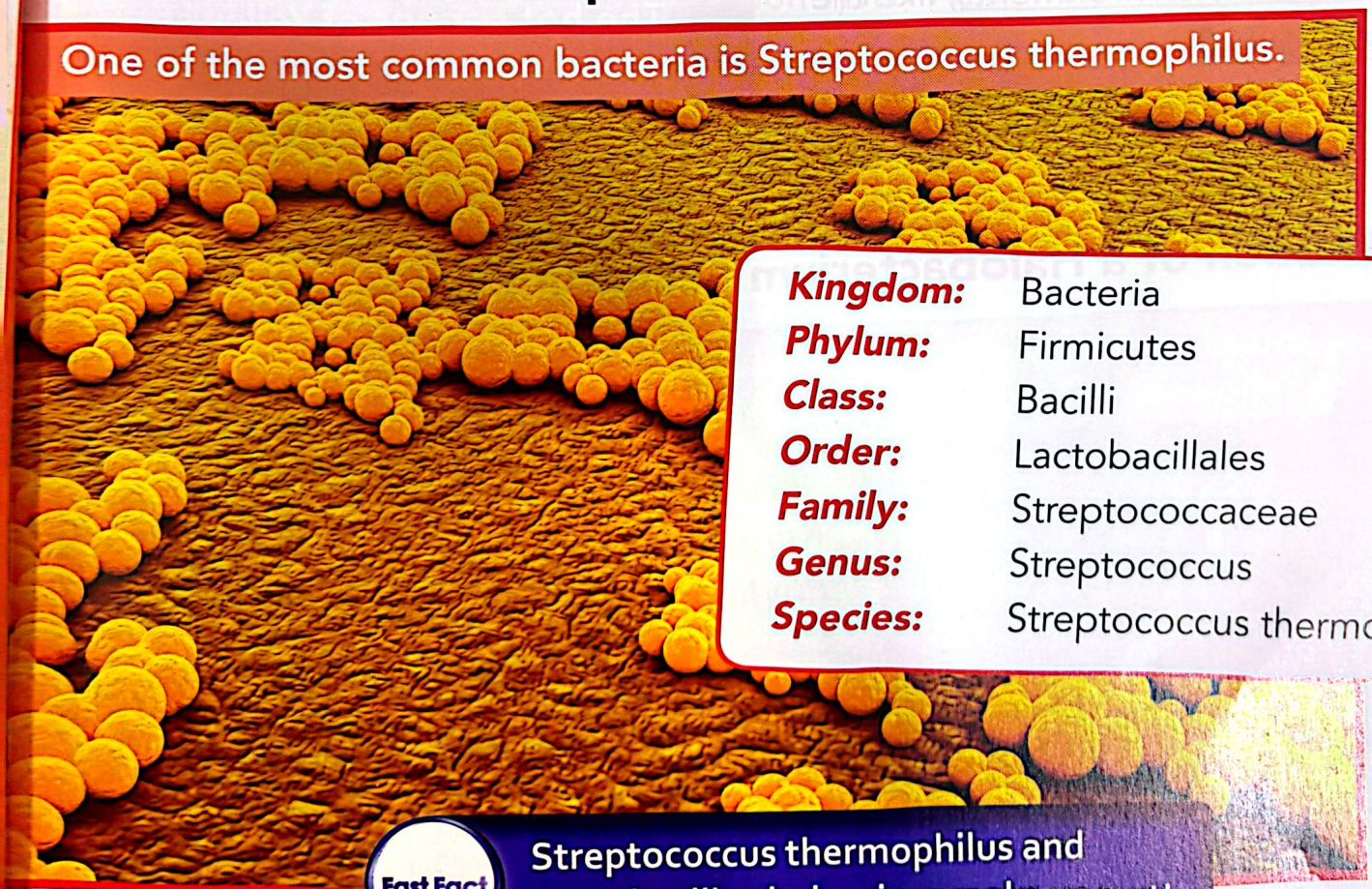
_____:

Kingdom: _____
Phylum: _____
Class: _____
Order: _____
Family: _____
Genus: _____
Species: _____

Draw it.

Classification of a Streptococcus Thermophilus:

One of the most common bacteria is Streptococcus thermophilus.



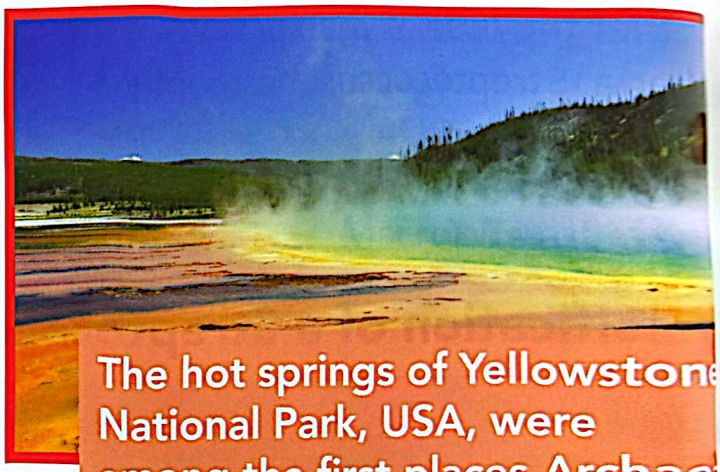
Kingdom:	Bacteria
Phylum:	Firmicutes
Class:	Bacilli
Order:	Lactobacillales
Family:	Streptococcaceae
Genus:	Streptococcus
Species:	Streptococcus thermophilus

Fast Fact Streptococcus thermophilus and Lactobacillus bulgaricus make yogurt!

Domain Archaea → Kingdom Archaea

Archaea are similar to bacteria. Their structure and genetic material is what mak them different. They aren't multicelled; they are single-celled. Archaea were not classified into their own domain until 1970.

Chemical structure is how archaea are classified. They can live in harsh environments and get energy from unusual sources. They can be found in very cold areas, like the Arctic ice, in high temperature areas, like hot springs, and even in very salty environments, like the Dead Sea.



The hot springs of Yellowstone National Park, USA, were among the first places Archae were discovered.

Classification of a Halobacterium Salinarum:

These were found in places with high salt content like Yellowstone National Park.

Kingdom:	Archaea
Phylum:	Euryarchaeota
Class:	Halobacteria
Order:	Halobacteriales
Family:	Halobacteriaceae
Genus:	Halobacterium
Species:	Halobacterium salinarum