


Student Name: \_\_\_\_\_



## 7<sup>th</sup> Grade Science- Week 1

Complete the following assignments for week 1.

Week	Topic/TEKS	Agenda
1	<p><b>Classification: Domains and Kingdoms</b></p> <p>6.12(C) recognize that the broadest taxonomic classification of living organisms is divided into currently recognized domains</p> <p>6.12(D) identify the basic characteristics of organisms, including prokaryotic or eukaryotic, unicellular or multicellular, autotrophic or heterotrophic, and mode of reproduction, that further classify them in the currently recognized kingdoms</p>	<ol style="list-style-type: none"> <li>1. <b>Video: Domains and Kingdoms</b> <ul style="list-style-type: none"> <li>• Watch this video for an introduction to Domain and Kingdoms.</li> <li>• <a href="https://youtu.be/TBO0c1laNtw">https://youtu.be/TBO0c1laNtw</a></li> </ul> </li> </ol>  <ol style="list-style-type: none"> <li>2. <b>Reading Classification of Organisms</b> <ul style="list-style-type: none"> <li>• Read the article. While you read, complete the Linking Literacy: Concept Definition Map.</li> <li>• After you read, complete Linking Literacy: Categorize Cut and Paste.</li> </ul> </li> <li>3. <b>Practice: Classification of Organisms Graphic Organizer</b> <ul style="list-style-type: none"> <li>• Cut out the trait cards and complete the graphic organizer and questions</li> </ul> </li> <li>4. <b>Math Connection: Classification of Organisms</b> <ul style="list-style-type: none"> <li>• Analyze the data table and complete the questions.</li> </ul> </li> <li>5. <b>Reading in Science: What's in a Name?</b> <ul style="list-style-type: none"> <li>• Read and annotate the text and answer the questions.</li> </ul> </li> <li>6. <b>Claim-Evidence-Reasoning</b> <ul style="list-style-type: none"> <li>• Read the scenario and complete the CER.</li> </ul> </li> <li>7. <b>Assessment: Classification of Organisms</b> <ul style="list-style-type: none"> <li>• Complete the assessment.</li> </ul> </li> </ol>



# Classification of Organisms

## Reflect

Organization helps us make sense of our surroundings. Some people organize their sock drawers by color. Books in a library are often organized by topic. Food in a grocery store is organized so we to know just where to find something.

For scientists, organization is an essential tool. The organization of similar organisms into groups helps scientists understand how living things are related. It also allows scientists to communicate about all forms of life. For example, suppose a scientist in the United States writes about a specific group of animals. Other scientists around the world will know exactly which group of animals the writer is referring to. But, how do scientists decide which organisms to group together? Do they use a particular process?

### Scientists classify organisms in different ways.

Scientists organize the living world using a process called *taxonomy*, which is the science of classifying organisms based on shared structures, functions, and relationships to other organisms.

For example, organisms can be classified based on their cellular structure. Organisms that have **nuclei** are *eukaryotes*. Eukaryotes also have *organelles*, or specialized structures bound in a membrane. They are in a different group than *prokaryotes*, which are organisms that do not have nuclei. Also, many **unicellular** organisms are in a different group than **multicellular** organisms. For example, bacteria are unicellular organisms. They are in a different group than animals, which are multicellular.

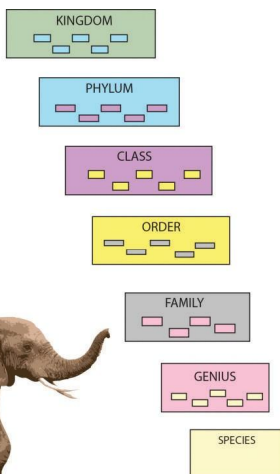
**nuclei:** plural for nucleus; part of a cell that holds structures which control cell activities

**unicellular:** made up of one cell

**multicellular:** made up of more than one cell

Living things also can be classified according to the way in which they obtain food. Think about the differences between plants and animals. Plants make their own food and are called *autotrophs*. Animals must consume other organisms and are called *heterotrophs*. This difference classifies plants and animals into two separate groups.

Method of reproduction can be used to classify organisms into even smaller groups. The two main reproductive methods are asexual and sexual reproduction. In asexual reproduction, only one parent is involved in producing offspring. In sexual reproduction, two parents are involved: a male and a female.

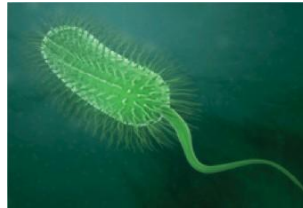


Taxonomy is the process of classifying organisms based on similarities.

# Classification of Organisms

## What Do You Think?

Take a look at the images below. Which organisms would you group together? Why? What additional information would you need to know about the organisms to improve how you classified them?

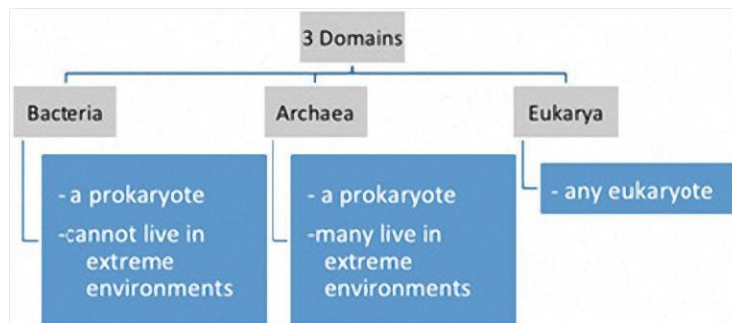


### Scientists classify organisms into three domains.

Scientists use a branching system of classification. The broadest group is the domain. Each domain is subdivided into kingdoms, followed by phyla, class, order, family, genus, and species. We will focus on domains and kingdoms.

All living organisms are classified into one of three domains: Bacteria, Archaea, and Eukarya. Domain Bacteria includes

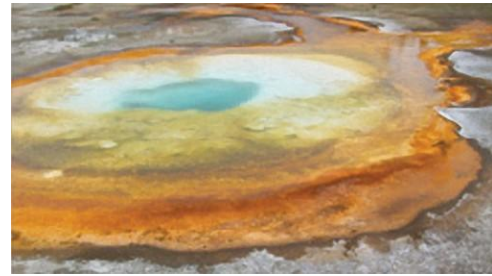
organisms commonly referred to as bacteria, which are unicellular prokaryotes. They are tiny organisms that reproduce asexually. Some bacteria are autotrophs (make their own food), but most of them are heterotrophs (consume their food.)



# Classification of Organisms

## What Do You Think?

The organisms in Domain Archaea are a specialized group of unicellular prokaryotes. Scientists discovered these unique organisms living in areas of extreme conditions. Some archaea are found in hot springs and are called thermophiles (“heat loving”). Other archaea are found in very salty conditions and are called halophiles (“salt loving”). Similar to bacteria, archaea reproduce asexually. Some archaea are autotrophs and others are heterotrophs. You might wonder why archaea and bacteria are divided into separate domains. After all, they are both unicellular prokaryotes. In the 1970s, a study revealed that the cellular structures of archaea are so different from bacteria they deserved their own domain. For example, archaea have a unique plasmid membrane structure not found in any other organisms.



Some of the first archaea were discovered in hot springs like this one. Hot springs are natural pools of extremely hot water.

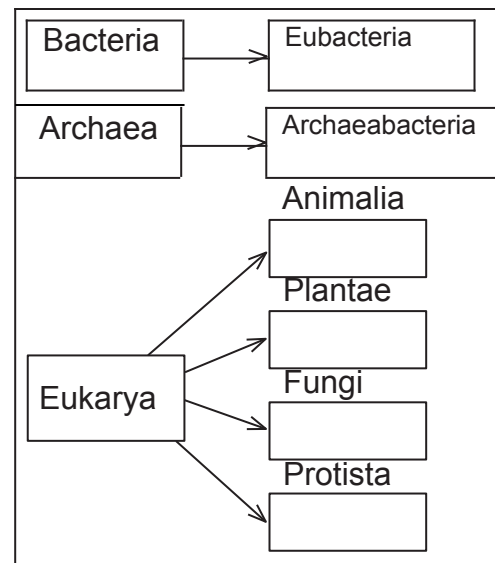
Domain Eukarya includes all eukaryotes. This is a diverse group of organisms. It includes plants, animals, fungi, and protists. These organisms are classified together because they are made up of eukaryotic cells. Characteristics like structure, function, and method of reproduction further classify the organisms into smaller groups called kingdoms.

## Scientists Classify Organisms into Six Kingdoms.

The three domains are further divided into six kingdoms. The first two kingdoms are easy to remember. Domain Bacteria has just one kingdom: Eubacteria. kingdom Archaea also has just one kingdom: Archaeobacteria. Identifying the organisms in domain Eukarya is when classification gets more complicated.

Domain Eukarya has four kingdoms: Animalia, Plantae, Fungi, and Protista. They are classified based on the complexity of their cellular organization, their ability to obtain nutrients, and their mode of reproduction.

Organisms in kingdom Animalia are the most complex and are commonly referred to as animals. They are multicellular heterotrophs. Most reproduction in this kingdom is sexual, although a few animals can reproduce asexually. For example, if you divide a flatworm in half, each of the two halves will grow into a new flatworm.



The three domains are divided into six kingdoms.

# Classification of Organisms

## What Do You Think?

In the kingdom Plantae, the organisms are referred to as plants and are also very complex. Plants are autotrophs, since they make their own food. They are multicellular and can reproduce sexually or asexually.

Kingdom Fungi includes organisms such as mushrooms and molds. Most fungi are multicellular and can reproduce sexually or asexually. All fungi are heterotrophs. However, the way in which they obtain food is unique. Fungi absorb nutrients from the environment. Think about a piece of moldy bread. The mold is a fungus that releases chemicals to break down the bread into smaller substances. The mold can then absorb these smaller substances, using them as nutrients. This characteristic makes fungi different from animals.

Kingdom Protista includes organisms with fairly simple structures compared to other eukaryotes. There is great diversity among the protists. Most of them are unicellular. However, some protists are multicellular. Some are autotrophs, in which case they resemble plants. Other protists are heterotrophs, more closely resembling animals. They swim through water and consume nutrients from their environment. Their simple organization keeps them in a separate kingdom from plants and animals.



The simple organization of seaweed places them in kingdom Protista.

## Look Out!

Protists have been the most difficult group of organisms for scientists to classify. Some protists, like green algae, have the photosynthetic pigment chlorophyll that gives them a green color similar to plants. Other protists behave more like animals, with whip-like structures that allow them to zoom around in the water. You can think of protists as the “other” category. They are single-celled organisms with a nucleus, but their structures are too simple to qualify them as plants or animals.

## Try Now

People often say that dogs are “man’s best friend.” How closely related are dogs and humans? To complete this activity, you will need a computer with Internet connection, a piece of paper, a pen or pencil, and crayons or markers.



# Classification of Organisms

## Try Now

1. Search the Internet to find the taxonomy of the domestic dog and humans, from domain through species. Check at least three different sources to make sure the information you find is correct. Try using websites that end in .gov or .edu; they are usually reliable.
2. Create a chart listing the taxonomy of each species side-by-side, similar to the chart shown below.

	Domestic Dog	Human
Domain		
Kingdom		
Phylum		
Class		
Order		
Family		
Genus		
Species		

3. Circle classifications that are the same for dogs and humans using one color of crayon or marker. Circle the classifications that are different using another color of crayon or marker.
4. What does this information tell you about similarities and differences between dogs and people?

### Discover Science: A Changing Classification System


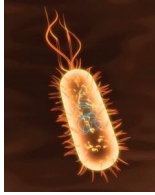




The classification system we use today has changed many times over the years as new information was discovered. Swedish scientist Carl Linnaeus is known for creating the first version of the modern taxonomy system in the 1700s. He classified organisms into two kingdoms: Animalia and Plantae. Years later, as scientists were able to use better microscopes and observe organisms more closely, they added three more kingdoms to the system: Monera (unicellular prokaryotes), Protista, and Fungi. In recent years, the classification shifted again and is now the three-domain system you've just learned about. The new system is based on information from cell studies and the fairly recent discovery of archaea. Do you think the system will change again in the future? If you answered yes, you are probably right! Scientists are always making new discoveries. Some of these discoveries will likely encourage them to rethink the current, three-domain system.

# Classification of Organisms

## Try Now

### What do you know?

Organisms are classified into domains and kingdoms based on specific characteristics. Take a look at the pictures below and read the characteristics in the boxes. Decide how you would classify each organism into a domain and a kingdom based on this information. Write your answers in the spaces below the pictures.

		
<p>Domain:</p> <p>Kingdom:</p>	<p>Domain:</p> <p>Kingdom:</p>	<p>Domain:</p> <p>Kingdom:</p>
<ul style="list-style-type: none"> <li>• Eukaryote</li> <li>• Heterotroph</li> <li>• Reproduces sexually</li> </ul>	<ul style="list-style-type: none"> <li>• Prokaryote</li> <li>• Heterotroph</li> <li>• Reproduces asexually</li> <li>• Cannot live in extremely harsh environments</li> </ul>	<ul style="list-style-type: none"> <li>• Eukaryote</li> <li>• Autotroph</li> <li>• Simple organization</li> </ul>
		
<p>Domain:</p> <p>Kingdom:</p>	<p>Domain:</p> <p>Kingdom:</p>	<p>Domain:</p> <p>Kingdom:</p>
<ul style="list-style-type: none"> <li>• Prokaryote</li> <li>• Lives in extreme environments</li> <li>• Reproduces asexually</li> </ul>	<ul style="list-style-type: none"> <li>• Eukaryote</li> <li>• Heterotroph</li> <li>• Reproduces sexually and asexually</li> </ul>	<ul style="list-style-type: none"> <li>• Eukaryote</li> <li>• Autotroph</li> <li>• Complex organization</li> </ul>



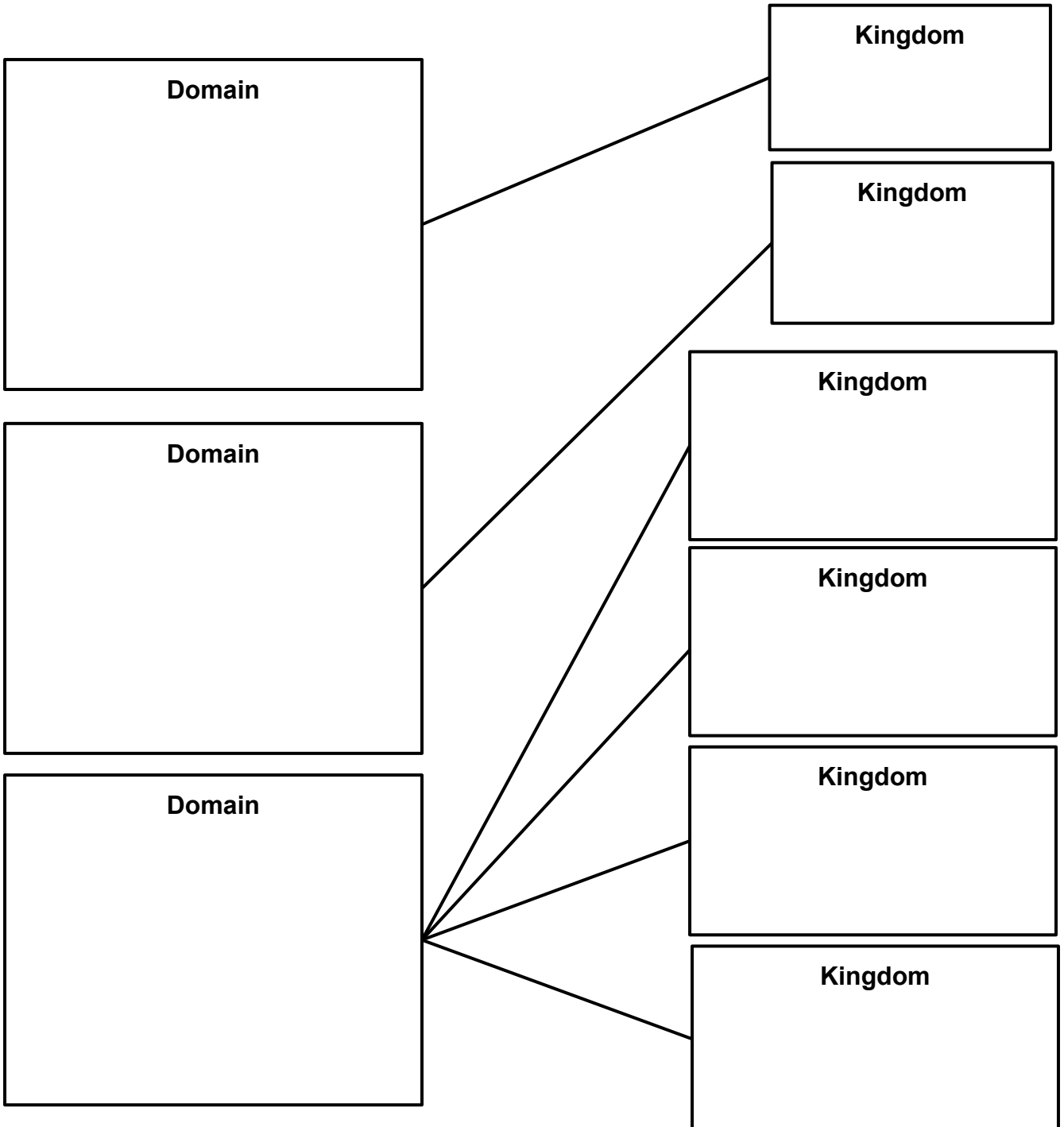


# Linking Literacy

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Concept Definition Map

Use the boxes below to organize information as you read. Describe the domains in the boxes on the left. List and describe the kingdoms in the boxes on the right.







# Linking Literacy

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Categorize Cut and Paste

Cut out the words below and paste them in the correct kingdom based on your knowledge from the text.

Bacteria	Archaea	Animalia	Plantae	Fungi	Protista

Heterotroph	Asexual	Sexual	Absorb food from environment	Most complex
Heterotroph	Asexual	Sexual or asexual	Unicellular	Mostly unicellular
Autotroph	Some are autotrophs	Live in water	Unicellular	Multicellular
Some are autotrophs	Some are autotrophs	Extreme environment	Multicellular	Multicellular





# Guided Practice

Name: \_\_\_\_\_ Date: \_\_\_\_\_

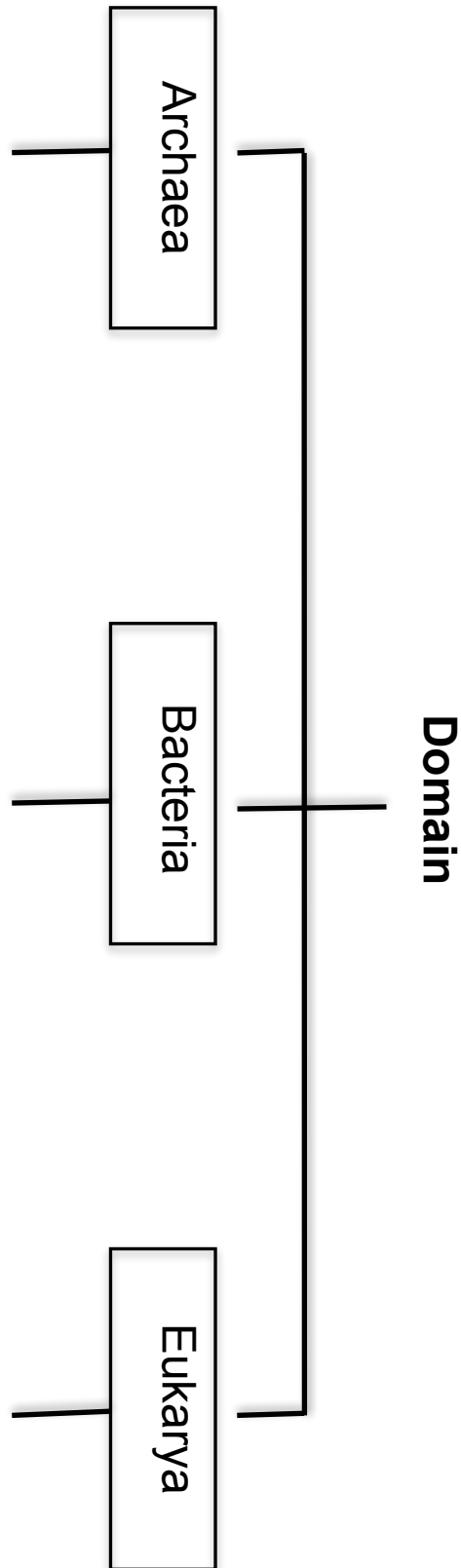
## Attachment: Classification of Organisms Graphic Organizer

Directions: Please match the trait cards with the proper domain classification.

Four vertical lines for writing trait cards.

Four vertical lines for writing trait cards.

Four vertical lines for writing trait cards.









# Guided Practice

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Attachment: Classification of Organisms Review Questions

Use your graphic organizer to answer the questions below.

1. Which domains are prokaryotic?
2. Which domain contains unicellular and multicellular organisms?
3. Which word refers to an organism that has a nucleus and other membrane-bound organelles?
4. Which domain do you think is the most complex? Explain your answer.
5. All three domains contain autotrophic and heterotrophic specimens. What is the difference between autotrophic and heterotrophic organisms?





# Guided Practice

## Traits

Only unicellular	Does not contain a nucleus
Contains a nucleus	Multicellular and unicellular types
Only unicellular	Does not contain a nucleus
Prokaryotic	Asexual reproduction
Eukaryotic	Asexual reproduction
Prokaryotic	Asexual and sexual reproduction types

Only unicellular	Does not contain a nucleus
Contains a nucleus	Multicellular and unicellular types
Only unicellular	Does not contain a nucleus
Prokaryotic	Asexual reproduction
Eukaryotic	Asexual reproduction
Prokaryotic	Asexual and sexual reproduction types





# Reading Science

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## What's in a Name?

1 Shakespeare wrote in *Romeo and Juliet*, "What's in a name? That which we call a rose by any other name would smell as sweet." He was saying that it doesn't matter what we call something. While it may not matter to fiction writers, names are very important to scientists. Scientists need a way to sort and classify groups of life-forms. How scientists do that has changed over time. As we learn more and more about the world around us, classifications are updated.



2 As science learns more about the characteristics of organisms, we have gotten better at classifying them. The most basic level of classification is prokaryote and eukaryote. Prokaryotes are organisms that don't have a nucleus. They also don't have any other cell structures surrounded by membranes. They are species of bacteria and archaea. Eukaryotic cells have a nucleus and complex parts enclosed within membranes. The organisms that we know by sight are all eukaryotes. They are animals, flowers, mushrooms, and protists.

3 A domain is the largest rank of organism. There are three domains: Eukarya, Bacteria, and Archaea. Eukarya is the domain for all eukaryotes. These organisms have a cell nucleus and a membrane that encloses a complex structure. Most of what we think of as "animals" are in this domain. It includes all plants, fungi, and protists. Bacteria is the domain made of bacteria. These prokaryotes include the oldest fossils on Earth. Though some bacteria cause disease, others can cure illness. Archaea is the domain made of archaea. These prokaryotes often live in extreme places. Some can be found in the boiling water of a hot spring. Others live on the oxygen-deprived ocean floor.

4 Every living being on the planet falls into one of these three domains. All eukaryotes are a part of the Eukarya domain. All bacteria are a part of the Bacteria domain. All archaea fall into the Archaea domain.

5 The next smallest rank of organism is kingdom. The eukaryotic kingdoms are: Animalia, Fungi, Plantae, and Protista. The prokaryotic kingdoms are Eubacteria and Archaea. Organisms are sorted into kingdoms based on how complex their cells are and how they obtain nutrients and reproduce.

6 Some organisms have only one cell. These are called unicellular organisms. They include bacteria, protists, archaea, and some fungi. With only one cell, these life-forms are usually tiny. Very few are large enough to be seen with the naked eye. These organisms must carry out all life processes in that one cell. In contrast, multicellular organisms have more than one cell. In multicellular organisms, cells serve specialized purposes. They must work together to take care of all the life processes of the organism.



# Reading Science

- 7 There are two ways an organism can get nutrients. Autotrophs make their own. Heterotrophs get what they need to survive from other organisms. Most bacteria and archaea are autotrophs. Plants are photoautotrophic. They use light from the sun to make the food they need to survive. People are heterotrophs. People must eat other organisms to get the nutrients they need. We would still need food even if we walked around all day with our arms stretched out to the Sun.
- 8 There are two types of reproduction. In asexual reproduction, there is just one parent. Offspring only carry the genes of that parent. There are many different ways for an organism to reproduce asexually. They can even simply divide into two daughter cells. This is called binary fission. Many unicellular organisms reproduce asexually. In sexual reproduction, offspring are made by joining genetic material from two parents. This happens with most multicellular organisms.
- 9 Naming and classifying organisms is a tricky process. Scientists must make changes to keep up with new discoveries and information. Knowing the basics can help you think like a scientist when you read about life science.





# Reading Science

- 1.** Why are humans called heterotrophs?
  - A** Humans eat other organisms to get the nutrients they need to survive.
  - B** Humans have a complex cell structure.
  - C** Humans make offspring by joining two sets of genetic material.
  - D** Humans have a nucleus and a cell membrane.
  
- 2.** A unicellular protist is part of which domain?
  - A** Archaea
  - B** Bacteria
  - C** Eukarya
  - D** Not enough information to determine
  
- 3.** Based on the information in this passage, which of the following is a reasonable conclusion?
  - A** Scientists will never change the classification system again.
  - B** Scientists know everything there is to know about all organisms.
  - C** Scientists have never changed the classification system.
  - D** New scientific discoveries could change the current classification system.



# Reading Science

4. What is the most likely meaning of the root word *photo* in the word *photoautotroph* in Paragraph 7?
- A Picture
  - B Light
  - C Nutrients
  - D Synthesis
5. Which of the following is the best summary of the passage?
- A Eukaryotes and prokaryotes are different. One has a nucleus with a cell membrane and the other does not. Humans are eukaryotes.
  - B There are many ways to classify organisms. They can be either bacteria or archaea.
  - C There are three domains of life. All living creatures are a part of the Eukarya, Bacteria, or Archaea domain. There are six kingdoms, and organisms are grouped into kingdoms based on the complexity of their cell structure, how they reproduce, and how they obtain nutrients.
  - D Organisms are everywhere. Some have a complex cell structure, and some are unicellular. Some organisms thrive in extreme places. They are called archaea and can even live in hot springs and on ocean floors.



# Reading Science

**1**

Archaea

Bacteria

<b>2</b>	Animalia	Plantae	<b>3</b>
----------	----------	---------	----------

Archaea

**4**

**U**

**M**

**M**

**U**

**U**

**U**

**M**

**U** = unicellular                      **M** = multicellular

6. Examine the incomplete graphic pictured above. Which label belongs in Box 3?
- A Fungi
  - B Protista
  - C Eubacteria
  - D Eukarya





Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Classification of Organisms

Fundamental differences in the cell, (the basic unit of all life,) allow for the broadest classification of all living organisms into three domains: bacteria, archaea, and eukarya. Domains are divided into six kingdoms by identifying internal structures and functions, rather than outward characteristics of an organism.

Organisms are classified as prokaryotic or eukaryotic, based upon their level of cellular organization. They can also be classified based on the number of cells in their bodies, how they obtain nutrients, and how they reproduce.

### Organism Classification by Domain and Kingdom

	Domain	Kingdom	Type of cells	Reproduction	Food source	Named species
Prokaryotic	Bacteria	Bacteria	Unicellular	Asexual	Autotrophs & heterotrophs	4,000
	Archaea	Archaea	Unicellular	Asexual	Autotrophs & Heterotrophs	
Eukaryotic	Eukarya	Protista	Uni- or Multi-cellular	Asexual & sexual	Autotrophs & Heterotrophs	80,000
		Fungi	Multicellular	Sexual	Heterotrophs	72,000
		Plantae	Multicellular	Sexual	Autotrophs	270,000
		Animalia	Multicellular	Sexual	Heterotrophs	1,324,000

Use the chart above to answer questions about the number of species in the world.

- Based on the chart above, how many named organisms are there in the world? \_\_\_\_\_
- What percent of the named organisms are bacteria and archaea?  
(part/whole x 100 = percent) \_\_\_\_\_
- What percent of the named species reproduce only sexually? \_\_\_\_\_
- What percent of the named species are in the animalia kingdom? \_\_\_\_\_
- What percent of the named species are from kingdoms with only heterotrophs that sexually reproduce? \_\_\_\_\_







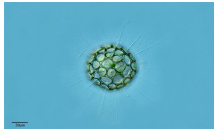
# Claim-Evidence-Reasoning

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Scenario

Scientists classify organisms according to different characteristics. These characteristics may relate to how they move, breathe, and reproduce. The following organisms are grouped differently.

### External Data



### Prompt:

Write a scientific explanation that explains how the above organisms are classified into different groups.

Claim: \_\_\_\_\_

Evidence: \_\_\_\_\_

Reasoning: \_\_\_\_\_

Rebuttal: \_\_\_\_\_



# Claim-Evidence-Reasoning

## Classification of Organisms CER Rubric for Writing a Scientific Explanation

Points Awarded	2	1	0
<b>Claim</b>	Claim is complete and accurate.	Claim is incomplete or inaccurate.	Student does not make a claim or does not answer the question.
<b>Evidence</b>	Evidence cites data and patterns within the data and uses labels accurately.	Evidence cites data from the data source but not within the context of the prompt.	There is no evidence, or changes are cited but do not use data from the data source.
<b>Reasoning</b>	Student cites the scientifically accurate reason using correct vocabulary, connects the reason to the claim, and shows accurate understanding of the concept.	Student cites a reason, but it is inaccurate or does not support the claim. Reasoning does not use scientific terminology or uses it inaccurately.	There is no reasoning, or student relies on a restatement of the claim.
<b>Rebuttal</b>	Rebuttal provides reasons for different data or outliers in the data, offers relevant real-world cases, or suggests other uses for the findings.	Rebuttal is not connected to the data, or it is not accurate.	Student does not offer a rebuttal.

## Assessment: Classification of Organisms

1 Which of the following characteristics can be used to classify an organism into a taxonomic domain?

- A Being unicellular or multicellular
  - B Mode of reproduction
  - C Presence of nucleus in cells
  - D Being heterotrophic or autotrophic
- 

2 Organisms that are members of the family Coccinellidae are heterotrophic, reproduce sexually, and are multicellular. Knowing this, we can be certain they belong to which kingdom?

- A Animalia
  - B Plantae
  - C Eubacteria
  - D Protista
- 

3 All members of the kingdom Protista share which of the following characteristics? They all—

- A reproduce sexually.
  - B produce their own food.
  - C are made of more than one cell.
  - D have an enclosed nucleus.
- 

4 Which of the following kingdoms includes organisms that are single-celled eukaryotes that can be either heterotrophic or autotrophic?

- A Plantae
- B Fungi
- C Protista
- D Animalia

**5** Organisms in which of the following kingdoms can only reproduce sexually?

**A** Plantae

**B** Protista

**C** Fungi

**D** Animalia

---

**6** An organism that is multicellular, reproduces sexually, and makes its own food (autotrophic) is classified into which taxonomic kingdom?

**A** Fungi

**B** Plantae

**C** Protista

**D** Animalia

---

**7** Which characteristic is always true for all members of the plant kingdom?

**A** Is autotrophic

**B** Is unicellular

**C** Does not have a nucleus

**D** Reproduces asexually

8 Which of the following kingdoms consist of eukaryotes that only reproduce sexually?

- A Fungi
- B Animalia
- C Protista
- D Plantae

---

9 Pictured below is a chart containing characteristics of different kingdom classifications.

Kingdom	Cells	Energy	Reproduction
Plantae	Many	Autotrophic	Sexual and asexual
Animalia	?	?	?

What options correctly fill in the rest of the chart?

- A Many, heterotrophic, sexual
- B One, autotrophic, sexual, and asexual
- C One or many, autotrophic, sexual, and asexual
- D One or many, heterotrophic, sexual

