Name: Key Date: Period:

Three domains of life: Eubacteria, Archaea, and Eukarya

	Archaea (old bacteria)	Eubacteria	Eukarya
Multicellular or Unicellular	Unicellular	Unicellular	Varies: Unicellular (Protists) and Multicellular (Plants, Animals, and Fungi)
Cell Wall or No Cell Wall	Yes has a cell wall (made up of a different substance than Domain:eubacteria)	Yes has a cell wall	Varies (ONLY Plants and Fungi have cell walls)
Eukaryote or Prokaryote	Prokaryote	Prokaryote	Eukaryote
Autotroph or Heterotroph	Heterotoph	VARIES	VARIES – PLANTS and PROTISTS (algae) are the only AUTOTROPHS
Stationary or Mobile	Mobile	Mobile	Varies- PLANTS and FUNGI are mostly stationary PROTISTS and ANIMALS are fully mobile

1. Which two Domains contain organisms that do not have a nucleus in their cells?
   Archaea & Eubacteria
2. Which organisms in Domain Eukarya can make their own food? plants and protists
3. Which two Domains have ONLY unicellular organisms? Archaea and Eubacteria
4. If I found a new organism that was one cell big, could make its own food, had a nucleus in its cell, but did not contain a cell wall. Which Domain would you classify it under, and why?
   likely Protists - are unicellular and can be autotrophs (algae). They have a nucleus, therefore have to be eukaryotic.
   EUKARYOTA

Six Kingdoms of life

	Multicellular or Unicellular	Cell wall or No Cell Wall	Eukaryote or Prokaryote	Autotroph or Heterotroph	Stationary or Mobile
Archaeabacteria	Unicellular	Cell Wall	Prokaryote	Heterotroph	Mobile
Eubacteria (Monerans)	Unicellular	Cell Wall	Prokaryote	Varies – some are Autotrophs and some are Heterotrophs	Mobile
Protista	Unicellular	No cell wall	Eukaryotes	Varies – some are Autotrophs and some are Heterotrophs	Mobile
Fungi	Multicellular	Cell Wall	Eukaryote	Heterotroph	Stationary
Plantae	Multicellular	Cell Wall	Eukaryote	Autotroph	Stationary
Animalia	Multicellular	No Cell Wall	Eukaryote	Heterotroph	Mobile

Use the chart above to answer the questions:

1. How are members of the kingdom Eubacteria ***similar*** to members of the kingdom Protista?
   Both are unicellular, autotrophic or heterotrophic and mobile.
   How are members of the kingdom Eubacteria ***different*** from members of the kingdom Protista?
   Eubacteria have a cell wall and are prokaryotic.
2. How do fungi get their food? They have to feed (heterotroph)
3. Why are plants and fungi placed in separate kingdoms? They have different characteristics
4. How has technology affected classification? Differences in microscopic structures visible under the microscope (e.g. cell wall) allowed for more classification.

5. You are a taxonomist who has just discovered a new organism and you have to place it into one of the kingdoms. The organism seems to make its own food by utilizing its chlorophyll. The organism is only one cell big and is capable of moving freely. In addition to chlorophyll, the organism has several other organelles, including a nucleus. Which kingdom does your organism belong to? ***Make sure to support your answer with facts from the chart above.***

   Protists!

6. All organisms belong to one of three domains, depending on their characteristics. A domain is the most inclusive taxonomic category. A single domain can contain one or more kingdoms. Fill in the table below.

Domain	Domain Characteristics	Kingdoms Included in Domain
Eubacteria	◦ Carbon eating bacteria	Monera
Archaea	◦ Heat loving bacteria	Monera
Eukarya	◦ All eukaryotic organisms	- Fungi - Plantae - Animalia

7. **Practice with Domains and Kingdoms:**

DOMAIN	Bacteria	Archaea	Eukarya			
KINGDOM	**Eubacteria**	**Archaebacteria**	**Protista**	**Fungi**	**Plantae**	**Animalia**
CELL TYPE	Prokaryote	Prokaryote	Eukaryote	Eukaryote	Eukaryote	Eukaryote
CELL STRUCTURES	Cell walls with peptidoglycan	Cell walls without peptidoglycan	Cell walls of cellulose in some; some have chloroplasts	Cell walls of chitin; no chloroplast	Cell walls of cellulose; chloroplasts	No cell walls or chloroplasts
NUMBER OF CELLS	Unicellular	Unicellular	Most unicellular; some colonial; some multicellular	Most multicellular ; some unicellular	Multicellular	Multicellular
MODE OF NUTRITION	Autotroph or heterotroph	Autotroph or heterotroph	Autotroph or heterotroph	Heterotroph	Autotroph	Heterotroph
EXAMPLES	*Streptococcus, Escherichia coli*	Methanogens, halophiles	*Amoeba, Paramecium*, slime molds, giant kelp	Mushrooms, yeasts	Mosses, ferns, flowering plants	Sponges, worms, insects, fishes, mammals

Figure 18-3

Some definitions to remember:

Peptidoglycan: also known as murein, is a polymer (large molecule) consisting of **sugars and amino acids** (protein) that forms a mesh-like layer outside the plasma membrane of most bacteria, forming the cell wall.

Cellulose: strong fibers made of a **carbohydrate (sugar)** polymer. Cellulose is the major component of cotton fibers and wood and is used in paper production.

Chitin: Chitin is a large, structural **polysaccharide (sugar molecule)** made from chains of modified glucose. Chitin is found in the exoskeletons of insects, the cell walls of fungi, and certain hard structures in invertebrates and fish.

8. According to the figures, what is the main difference between the domain Bacteria and the domain Archaea?

The composition of their cell wall. (Petidoglycan)

9. If you know an organism has a cell wall and is a multicellular autotroph, could you use Figure 18-3 to determine the kingdom to which it belongs? NO Why or why not?

It could be a protism or a plant.

10. If you were told only that an organism is unicellular and has chloroplasts and a nucleus, could you use Figure 18-3 to determine the kingdom to which it belongs? Yes Why or why not?

The only eukaryotic, unicellular, autotroph is a protist.

11. . Using your notes, number the major classification groups (taxa) in order from the most specific (1) to the least specific (7).

5 class 3 family 2 genus 7 kingdom

4 order 6 phylum 1 species

Domain would be #8

12. Use the table to answer the questions that follow:

Kingdom	Animalia	Animalia	Animalia	Animalia
Phylum	Chordata	Chordata	Chordata	Chordata
Class	Mammalia	Mammalia	Mammalia	Mammalia
Order	Cetacea	Carnivora	Carnivora	Carnivora
Family	Mysticeti	Mustelidae	Felidae	Felidae
Genus	Balaenoptora	Mustela	Felis	Felis
Species	*B. physalus*	*M. furo*	*F. domesticus*	*F. rufus*
Common Name	Blue Whale	Ferret	Domestic cat	Bobcat

13. How does the table indicate that a cat is more closely related to a bobcat than a ferret? Determine which levels of organization are common and different among these animals.

A bobcat and cat are of the same classification except for species. The ferret and cat are of the same order, but not the same family.

14. Which two animals are most closely related? bobcat and cat How do you know?

Only differ in terms of species.

15. Predict what kind of animal is of the species *Balaenoptora borealis*? Whale. How do you know?

↑ Same Genus as the blue whale.