

18-3 Kingdoms and Domains



Slide 1 of 28

End Show

Copyright Pearson Prentice Hall

18-3 Kingdoms and Domains → The Tree of Life Evolves

The Tree of Life Evolves

Systems of classification adapt to new discoveries.

Linnaeus classified organisms into two kingdoms—animals and plants.

The only known differences among living things were the fundamental traits that separated animals from plants.

Slide 2 of 28

End Show

Copyright Pearson Prentice Hall

18-3 Kingdoms and Domains → The Tree of Life Evolves

Five Kingdoms

Scientists realized there were enough differences among organisms to make 5 kingdoms:

- Monera
- Protista
- Fungi
- Plantae
- Animalia

Slide 3 of 28

End Show

Copyright Pearson Prentice Hall

18-3 Kingdoms and Domains → The Tree of Life Evolves

Six Kingdoms

Recently, biologists recognized that Monera were composed of two distinct groups: Eubacteria and Archaeobacteria.

Slide 4 of 28

End Show

Copyright Pearson Prentice Hall

18-3 Kingdoms and Domains → The Tree of Life Evolves



What are the six kingdoms of life as they are now identified?

Slide 5 of 28

End Show

Copyright Pearson Prentice Hall

18-3 Kingdoms and Domains → The Tree of Life Evolves



The six-kingdom system of classification includes:

- Eubacteria
- Archaeobacteria
- Protista
- Fungi
- Plantae
- Animalia

Slide 6 of 28

End Show

Copyright Pearson Prentice Hall

18-3 Kingdoms and Domains → The Tree of Life Evolves

Changing Number of Kingdoms

Introduced	Names of Kingdoms				
1700's	Plantae				Animalia
Late 1800's	Protista		Plantae		Animalia
1950's	Monera		Protista	Fungi	Plantae
1990's	Eubacteria	Archaeobacteria	Protista	Fungi	Plantae

Slide 7 of 28

End Show

Copyright Pearson Prentice Hall

18-3 Kingdoms and Domains → The Three-Domain System

The Three-Domain System

Molecular analyses have given rise to a new taxonomic category that is now recognized by many scientists.

The **domain** is a more inclusive category than any other—larger than a kingdom.

Slide 8 of 28

End Show

Copyright Pearson Prentice Hall

18-3 Kingdoms and Domains → The Three-Domain System



What is the three-domain system of classification?

Slide 9 of 28

End Show

Copyright Pearson Prentice Hall

18-3 Kingdoms and Domains → The Three-Domain System



The three domains are:

- Eukarya, which is composed of protists, fungi, plants, and animals.
- Bacteria, which corresponds to the kingdom Eubacteria.
- Archaea, which corresponds to the kingdom Archaeobacteria.

Slide 10 of 28

End Show

Copyright Pearson Prentice Hall

18-3 Kingdoms and Domains → The Three-Domain System

Modern classification is a rapidly changing science.

As new information is gained about organisms in the domains Bacteria and Archaea, they may be subdivided into additional kingdoms.

Slide 11 of 28

End Show

Copyright Pearson Prentice Hall

18-3 Kingdoms and Domains → Domain Bacteria

Domain Bacteria

Members of the domain Bacteria are unicellular prokaryotes.

Their cells have thick, rigid cell walls that surround a cell membrane.

Their cell walls contain peptidoglycan.

Slide 12 of 28

End Show

Copyright Pearson Prentice Hall

18-3 Kingdoms and Domains → Domain Bacteria

The domain Bacteria corresponds to the kingdom **Eubacteria**.

Classification of Living Things	
DOMAIN	Bacteria
KINGDOM	Eubacteria
CELL TYPE	Prokaryote
CELL STRUCTURES	Cell walls with peptidoglycan
NUMBER OF CELLS	Unicellular
MODE OF NUTRITION	Autotroph or heterotroph
EXAMPLES	<i>Streptococcus</i> , <i>Escherichia coli</i>

Slide 13 of 28
End Show

18-3 Kingdoms and Domains → Domain Archaea

Domain Archaea

Members of the domain **Archaea** are unicellular prokaryotes.

They live in extreme environments.

Their cell walls lack peptidoglycan, and their cell membranes contain unusual lipids not found in any other organism.

Slide 14 of 28
End Show

18-3 Kingdoms and Domains → Domain Archaea

The domain Archaea corresponds to the kingdom **Archaeobacteria**.

Classification of Living Things	
DOMAIN	Archaea
KINGDOM	Archaeobacteria
CELL TYPE	Prokaryote
CELL STRUCTURES	Cell walls without peptidoglycan
NUMBER OF CELLS	Unicellular
MODE OF NUTRITION	Autotroph or heterotroph
EXAMPLES	Methanogens, halophiles

Slide 15 of 28
End Show

18-3 Kingdoms and Domains → Domain Eukarya

Domain Eukarya

The domain **Eukarya** consists of organisms that have a nucleus.

This domain is organized into four kingdoms:

- Protista
- Fungi
- Plantae
- Animalia

Slide 16 of 28
End Show

18-3 Kingdoms and Domains → Domain Eukarya

Classification of Living Things				
DOMAIN	Eukarya			
KINGDOM	Protista	Fungi	Plantae	Animalia
CELL TYPE	Eukaryote	Eukaryote	Eukaryote	Eukaryote
CELL STRUCTURES	Cell walls of cellulose in some; some have chloroplasts	Cell walls of chitin	Cell walls of cellulose; chloroplasts	No cell walls or chloroplasts
NUMBER OF CELLS	Most unicellular; some colonial; some multicellular	Most multicellular; some unicellular	Multicellular	Multicellular
MODE OF NUTRITION	Autotroph or heterotroph	Heterotroph	Autotroph	Heterotroph
EXAMPLES	Amoeba, <i>Paramecium</i> , slime molds, giant kelp	Mushrooms, yeasts	Mosses, ferns, flowering plants	Sponges, worms, insects, fishes, mammals

Slide 17 of 28
End Show

18-3 Kingdoms and Domains → Domain Eukarya

Protista

The kingdom **Protista** is composed of eukaryotic organisms that cannot be classified as animals, plants, or fungi.

Its members display the greatest variety.

They can be unicellular or multicellular; photosynthetic or heterotrophic; and can share characteristics with plants, fungi, or animals.

Slide 18 of 28
End Show

18-3 Kingdoms and Domains → Domain Eukarya

Fungi

Members of the kingdom **Fungi** are heterotrophs.

Most fungi feed on dead or decaying organic matter by secreting digestive enzymes into it and absorbing small food molecules into their bodies.

They can be either multicellular (mushrooms) or unicellular (yeasts).



Copyright Pearson Prentice Hall

Slide 19 of 28

End Show

18-3 Kingdoms and Domains → Domain Eukarya

Plantae

Members of the kingdom **Plantae** are multicellular, photosynthetic autotrophs.

Plants are nonmotile—they cannot move from place to place.

Plants have cell walls that contain cellulose.

The plant kingdom includes cone-bearing and flowering plants as well as mosses and ferns.



Copyright Pearson Prentice Hall

Slide 20 of 28

End Show

18-3 Kingdoms and Domains → Domain Eukarya

Animalia

Members of the kingdom **Animalia** are multicellular and heterotrophic.

The cells of animals do not have cell walls.

Most animals can move about.

There is great diversity within the animal kingdom, and many species exist in nearly every part of the planet.



Copyright Pearson Prentice Hall

Slide 21 of 28

End Show

18-3 Section QUIZ

Continue to:

Section QUIZ

- Or -

Click to Launch:



Copyright Pearson Prentice Hall

Slide 22 of 28

End Show

18-3 Section QUIZ

1 Organisms whose cell walls contain peptidoglycan belong in the kingdom

a. Fungi.

A b. Eubacteria.

c. Plantae.

d. Archaeobacteria.



Copyright Pearson Prentice Hall

Slide 23 of 28

End Show

18-3 Section QUIZ

2 Multicellular organisms with no cell walls or chloroplasts are members of the kingdom

A a. Animalia.

b. Protista.

c. Plantae.

d. Fungi.



Copyright Pearson Prentice Hall

Slide 24 of 28

End Show

18-3 Section QUIZ

- 3 Organisms that have cell walls containing cellulose are found in
- a. Eubacteria and Plantae.
 - b. Fungi and Plantae.
 - A c. Plantae and Protista.**
 - d. Plantae only.



Copyright Pearson Prentice Hall

Slide
25 of 28

End Show

18-3 Section QUIZ

- 4 Molecular analyses have given rise to a new taxonomic classification that includes
- A a. three domains.**
- b. seven kingdoms.
 - c. two domains.
 - d. five kingdoms.



Copyright Pearson Prentice Hall

Slide
26 of 28

End Show

18-3 Section QUIZ

- 5 Which of the following contain more than one kingdom?
- a. only Archaea
 - b. only Bacteria
 - A c. only Eukarya**
 - d. both Eukarya and Archaea



Copyright Pearson Prentice Hall

Slide
27 of 28

End Show