

Chapter 4
Organization of Life
Section 3
Day 1

The Diversity of Living Things

- Most scientists classify organisms into _____ kingdoms based on different characteristics.
- Members of the six kingdoms get their food in different ways and are made up of different types of _____, the smallest unit of biological organization.
- The cells of animals, plants, fungi, and protists all contain a _____.
- While cells of bacteria, fungi, and plants all have _____.

Kingdom	Characteristics	Examples
Archaeobacteria		Methanogens (live in swamps and produce methane gas) and extreme thermophiles (live in hot springs)
Eubacteria		Proteobacteria (common in soils and in animal intestines) and cyanobacteria (also called blue-green algae)
Fungi		Yeasts, mushrooms, molds, mildews, and rusts
Protists		Diatoms, dinoflagellates (red tide), amoebas, trypanosomes, paramecia, and <i>Euglena</i> .
Plants		Ferns, mosses, trees, herbs, and grasses
Animals		Corals, sponges, worms, insects, fish, reptiles, birds, and mammals

Bacteria

- _____ are extremely small, single-celled organisms that usually have a cell wall and reproduce by cell division.
- Unlike all other organisms, bacteria lack _____.
- There are two main kinds of bacteria, _____.
- Most bacteria are eubacteria.
- Bacteria live in every habitat on Earth, from hot springs to the bodies of animals.

Bacteria and the Environment

- Some kinds of bacteria _____ of other organisms and return the nutrients to the soil.
- Others recycle nutrients, such as _____.
- Certain bacteria can convert nitrogen from the air into a form that plants can use.
- This conversion is important because nitrogen is the main component of _____.

Bacteria and the Environment

- Bacteria also allow many organisms, including humans, to extract certain nutrients from their food.
- The bacterium, *Escherichia coli* or _____, is found in the intestines of humans and other animals and helps digest food and release vitamins that humans need.

Fungi

- A _____ is an organism whose cells have nuclei, rigid cell walls, and no chlorophyll and that belongs to the kingdom Fungi.
- _____ act like mini-skeletons that allow fungi to stand up right.
- A _____ is the reproductive structure of a fungus.
- The rest of the fungus is an underground network of fibers that absorb food from decaying organisms in the soil.

Fungi

- Fungi get their food by _____ that help break down organic matter, and then absorbing the nutrients.

- The bodies of most fungi are huge networks of threads that grow through the soil dead wood, or other material on which the fungi is feeding.
- Like bacteria, fungi play an important role in _____.

Fungi

- Some fungi, like some bacteria, cause _____.
- _____ is an example of a condition caused by fungi.
- Other fungi add flavor to food as in blue cheese. The fungus gives the cheese both its blue color and strong flavor.
- Yeasts are fungi that produce the gas that makes bread rise.

Protists

- _____ are diverse organisms that belong to the kingdom Protista.
- Some, like amoebas, are animal like. Others are plantlike, such as kelp, and some resemble fungi.
- Most protists are _____, including diatoms, which float on the ocean surface,
- Another protist, _____, is the one-celled organism that causes the disease malaria.

Protists

- From an environmental standpoint, the most important protists are _____.
- Algae are plantlike protists that can make their _____.
- They range in size from the giant kelp to the one-celled phytoplankton, which are the initial source of food in most ocean and freshwater ecosystems.

Plants

- Plants are many-celled organisms that make their own food _____.
- Most plants live on land where they use their leaves to get sunlight, oxygen, and carbon dioxide from the air.
- Plants absorb nutrients and water from the soil using their roots.

- _____ are connected by vascular tissue, which has thick cell walls and serves as a system of tubes that carries water and food.

Lower Plants

- The first land plants had no vascular tissue, and swimming sperm.
- They therefore had to live in damp places and could not grow very large.
- Their descendants alive today are small plants such as _____.
- _____ were the first vascular plants, with some of the ferns being as large as small trees.

Gymnosperms

- _____ are woody vascular seed plants whose seeds are not enclosed by an ovary or fruit.
- _____ are gymnosperms that bear cones.
- Much of our lumber and paper comes from gymnosperms.

Gymnosperms

- Gymnosperms have several adaptations that allow them to live in drier conditions than lower plants.
 - They can produce _____, which protects and moves sperm between plants.
 - These plants also produce _____, which protect developing plants from drying out.
 - A conifer's _____ also lose little water.

Angiosperms

- _____ are flowering plants that produce seeds within fruit. Most land plants are angiosperms.
- The _____ is the reproductive structure of the plant.
- Some angiosperms, like grasses, have small flowers that use wind to disperse their pollen.
- Other angiosperms have large flowers to attract insects and birds.
- Many flowering plants depend on animals to disperse their seeds and carry their pollen.

Angiosperms

- Most land animals are dependent on _____.

- Most of the food we eat, such as wheat, rice, beans, oranges, and lettuce comes from flowering plants.
- Building materials and fibers, such as oak and cotton also come from flowering plants.

Animals

- Animals cannot make their own food. They must take it in from the environment.
- Animal cells also have no cell walls, making their bodies soft and flexible.
- Some animals have evolved hard exoskeletons.
- As a result, animals are much more mobile than plants.
- All animals move around in their environment during at least one stage in their lives.

Invertebrates

- _____ are animals that do not have backbones.
- Many invertebrates live attached to hard surfaces in the ocean and filter their food out of the water, such as corals, various worms, and mollusks.
- These organisms are only mobile when they are _____.
- At this early stage in their life, they are part of the ocean's plankton.

Invertebrates

- Other invertebrates, including squid in the ocean and insects on land, actively move in search of food.
- More _____ exist on Earth than any other type of animal.
- Insects are successful for many reasons:
 - _____
 - _____
 - _____
 - their _____ allows them to live on little food and to hide from enemies in small places.

Invertebrates

- Many insects and plants have evolved together and depend on each other to survive.
- Insects carry pollen from male fruit parts to fertilize a plant's egg, which develops into fruits such as tomatoes, cucumbers, and apples.

- Insects are also valuable because they eat other insects that we consider pests.

Invertebrates

- However, insects and humans are often enemies.
- Bloodsucking insects transmit human diseases such as _____.
- Insects do most damage indirectly by eating our crops.

Vertebrates

- _____ are animals that have a backbone, and includes mammals, birds, reptiles, amphibians, and fish.
- The first vertebrates were _____, but today most vertebrates live on land.
- The first land vertebrates were _____.
- These animals were successful because they have an almost _____, which allows the egg to hatch on land, away from predators in the water.

Vertebrates

- Birds are _____ vertebrates with feathers.
- They keep their hard-shelled eggs and young warm until they have developed insulating layers of fat and feathers.
- Mammals are warm-blooded vertebrates that have _____.
- Birds and mammals have the ability to maintain a high body temperature, which allows them to live in cold areas, where other animals cannot live.