Chapter 2 - Viruses, Bacteria, Protists, and Fungi

Viruses - Lesson 1

Objectives
Name and describe the characteristics of viruses and how they multiply.
Discuss both positive and negative ways that viruses affect living things.

Virus
small - but vary in size and shape
nonliving particle
can not reproduce on its own
have a protein coat that protects genetic material in core

Why are viruses considered nonliving?
Viruses are not cells.
Viruses do not use their own energy to grow.
Viruses can not make food or take in food.
Viruses can only multiply when in a living cell.

Virus Needs
Viruses need a host.
host - an organism that provides a source of energy for a virus or another organism

Virus acts like a parasite.
parasite - an organism that lives on or in a host and causes it harm

Most viruses destroy the cell in which they use.

Even though the parasite lives on or in a host and causes it harm, the host usually continues to live and provide a source of energy for the parasite.
Virus Shapes
round, rod-shaped, bricks, bullets, robotlike shapes

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**Influenza Virus**

**Tobacco mosaic virus**

**T4 bacteriophage**

Assignment:
Name ___________________  Hour ___  Date _____

Virus
Find a virus and share the required information listed below through a visual.
5 points per requirement
___ name of virus
___ how did it get its name
___ shape of virus
___ what or who does it infect
___ how is it transmitted
___ how does it harm its host/what are the symptoms
___ draw a picture and color it
___ label the parts
   genetic material
   protein coat/envelope
   surface proteins
   or anything else you can
___ organized
___ meticulous
___ typed

Comments by Ms. Lowe:
Review
What two structural components are present in every virus?

- protein coat
- inner core of genetic material

Naming Viruses
Living organisms have the two part naming system but viruses are not living so this method is not used. Scientists name them by the disease they cause or the area they were discovered.

How do viruses multiply?
A virus will attach itself to a host cell. Once the virus is inside, the virus releases its genetic material into the cell. The genetic material takes over the cells functions. The virus tells the cell to produce the virus's proteins and genetic material. Which when produced will develop into new viruses.

Structure of a Virus
All viruses have:
- protein coat for protection
- inner core that contains the genetic material
- each virus contains unique surface proteins
- these proteins allow viruses only attach to certain hosts

example
- cold viruses attack the nose and throat cells

Page 43 Figure 4

How do Viruses interact with the Living World?
Viruses cause disease and we treat the symptoms. Colds run through the body quickly but some can be deadly.
Viruses do not just affect humans. Plants and animals can get viruses also.

Viruses are not all bad!!
Scientists use viruses to attach to cells and act as a messenger due to the proteins that attach themselves to cells.

Vaccine
may be weakened or dead viruses (because they are weakened or dead they do not cause disease) that are put into the body to produce chemicals that destroy these harmful viruses but puts your body into defense mode

how this helps is when it enters your body it is destroyed before it can make you sick
Lesson 2  Bacteria

Objectives
Name and describe structures, shapes, and sizes of a bacterial cell.
Explain how bacteria obtain food, obtain energy, and reproduce.
Describe the positive roles that bacteria play in the natural world.

What are bacteria?
Everywhere
small
prokaryotes
genetic material but not contained in a nucleus

Cell structures  page 47
- cell wall
  protects
- cell membrane
  just inside the cell wall that controls the materials that pass in and out of a cell
- cytoplasm
  gel substance that allows structures to move around inside the cell
  contains the genetic material
- ribosomes
  produces proteins
- flagellum
  whip-like structure that helps cell to move

Shapes
- spherical
- rodlike
- spiral

Sizes
largest is as big as a period at end of sentence

How do bacteria get food?
Autotrophs
Use sun’s energy like plants
Heterotrophs

Respiration
this is not breathing
need a constant supply of energy which comes from food

- cellular respiration
  breaking down of food to release energy and need oxygen
to do this
  some do not need oxygen and will die in the presence of oxygen

Reproduction
reproduce sexually and asexually
must have right temp., enough food and suitable conditions

- asexually through a process called binary fission
  cell divides to form two identical cells
- sexually
  conjugation
  bacterium transfers its genetic material into another bacterium, results in new combinations of genetic material, however this does not increase the number of bacteria because binary fission does this

Endospore
round, thick-walled that forms inside the cell
resist freezing, heating, and drying
they get carried away by wind, when conditions are suitable again it will open up and bacteria will reproduce again

Homework
Complete pages 46-52 in textbook.
What is the role of Bacteria in Nature?
We have talked about that when you think of bacteria you think of bad things.

Most bacteria is harmless or helpful to humans.

**Oxygen Production**
Some bacteria use the sun's energy to produce food and their by-product is $O_2$.

Scientists think that bacteria is what is responsible for the air on Earth.

**Food Production**
Some bacteria help to create different food but it does not have a taste.
Some bacteria will cause food to spoil.

**Refrigeration** and **Pasteurization** help to slow down bacteria growth.

**Pasteurization**
Food is heated to a temp. that will kill the bacteria and will not change the taste of the food

**Health/Medicine**
Bacteria produce vitamins your body needs.
Good Bacteria prevent bad bacteria from attaching to your intestines which could make you sick.
Bacteria is altered genetically to make insulin.

**Environmental Cleanup**
Bacteria is used to clean up oil spills by converting the poisonous chemicals into harmless substances.

**Environmental Recycling**
**Decomposers**
organisms that break down complex chemicals in dead organisms into simple compounds

**natural recyclers**
return chemicals back to the environment that other organisms can use

leaves
as leaves break down chemicals go into the soil to be absorbed by plants

**nitrogen fixing bacteria**
live in roots of certain plants
plants need nitrogen from the air but can not get it themselves, so bacteria will change nitrogen gas into nitrogen products that the plant needs

Complete pages 53 - 55. Due Tuesday.
Lesson 3

Protists

The World of Protista

Objectives
- Describe the characteristics of animal-like protists and give examples.
- Describe the characteristics of plant-like protists and give examples.

Protists
- Eukaryotes: all protists
- Not classified as animals, plants, or fungi
- Live in moist environments: all protists
- Most unicellular but some multicellular
- Heterotrophs, autotrophs, and some can be both
- Some cannot move, others can

Divided into three groups

Animal-like
- Called protozoans
- Heterotrophs: move to get food
- Unicellular

Protozoans - page 58
- Sarcodines: protozoans with pseudopods
  - Pseudopods = "false feet"
- Flagellates: protozoans with flagella
  - Flagella used for movement
- Ciliates: cilia - hair-like projections - movement, feeding

Plant-like
- Called algae
- Autotrophs: unicellular/multicellular
  - Pigments: green, yellow, red, brown, orange, or black
    - Most make their own food
  - Source of food near the surface of ponds, lakes, oceans
  - Euglenoids
  - Dinoflagellates
  - Diatoms
  - Red Algae
  - Brown Algae

Fungus-like
- Called "sort of like"
- Heterotrophs
  - Uses spores to reproduce
  - Able to move at some point in their life
  - Three Types of Fungus-like Protists
  - Slime Molds: colorful
    - Live in moist, shady places
    - Moves a mass oozing along
  - Water Molds: live in water or moist places
    - Grow like threads
    - Look like fuzz
    - Attack food crops
  - Downy Mildew: will destroy crops
    - Will remain in water
    - Very destructive to barley's chitons

Assignment
- Pages 61-65 in Workbook, answer all questions.
Amoeba

Paramecium

Pandorina

Euglena

Peranema

Euplotes

Blepharisma

Actinosphaerium

Arcella vulgaris