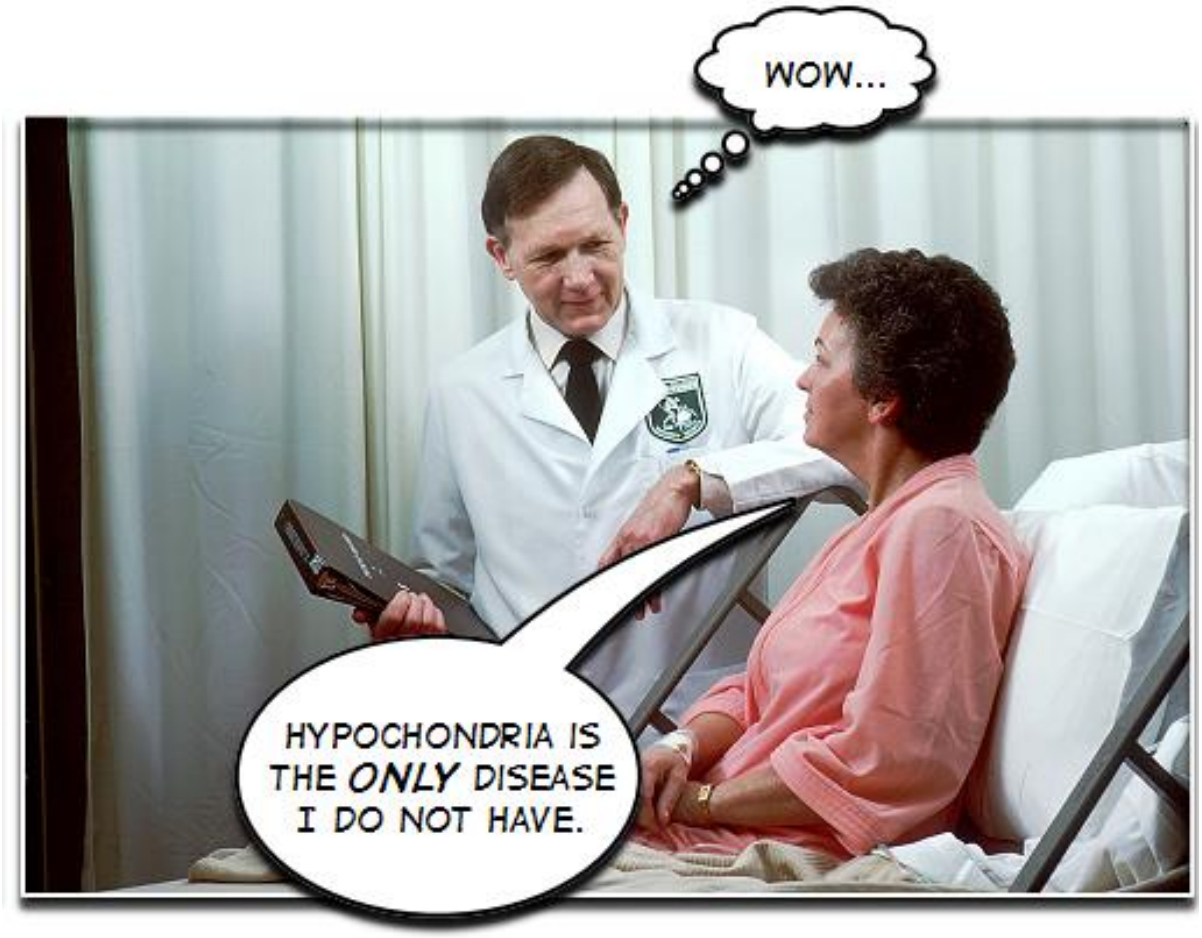
Chapter 19

Famine, Disease and Viruses



Day One:

Today, you and your child will:

1. Read the text
2. Review the text with your child
3. Complete the student worksheets
4. Collect the materials you will need for days two and three

National Science Education Standards covered this week:

Human populations include groups of individuals living in a particular location. One important characteristic of a human population is the population density—the number of individuals of a particular population that lives in a given amount of space.

The size of a human population can increase or decrease. Populations will increase unless other factors such as disease or famine decrease the population.

Definitions

Population density	a scientific way of saying "the number of individuals of a species in a certain area"
Famine	a time when lots of people go hungry and don't have enough food to eat
Disease	a sickness
Virus	a small organism that can spread disease

Sample questions to ask your child after completing the weekly reading.

Do many scientists believe the carrying capacity of humans is well-balanced?

No. many scientists believe that the growth rate of humans could be dangerous to the environment.

Where do most of the nutrients we eat come from?

Most of the nutrients we use to stay alive come from plants. We may not get these nutrients directly from plants, as the plants pass along their energy to herbivores and then to carnivores...

What are two things can slow down a population that is growing too large?

Answers may vary; however, famine and disease are two of the quickest and most natural ways to reduce the size of a population.

Answers to worksheet questions:

Page 1:

1) Famine - A time when lots of people go hungry and don't have enough food to eat
2) Population density - a scientific way of saying "the number of individuals of a species in a certain area"
3) Disease - a sickness
4) Viruses - a small organism that can spread disease

Page 2:

2 - population density
3 - famine
4 - disease
1 – viruses

Page 3:

1. A
2. B
3. C
4. B
5. C
6. A

Day Two:

Today, you and your child will:

1. Review Day One using the following text
2. Run the first activity this week

The following text will give you the most important items to review for your activity today.

Diseases are typically spread through the transmission of harmful bacteria or viruses throughout a population.

Should a habitat be overpopulated with organisms, the introduction of a bacteria or virus can quickly spread throughout the population. This can have devastating results.

Unlike bacteria, viruses cannot survive without a host.

Fizzing viruses

Objective:

Children will simulate how a virus can spread.

Materials:

10 small disposable cups or containers
water
hydrogen peroxide
bleach
eyedropper or straw

Procedure:

Explain to the child that when too many people are in a habitat, the population density increases. When this happens, the resources that are needed to support all of these people can get used up and the area goes through a famine. Also, if you get too many people in a crowded area, there is a chance that a disease can spread from person to person very quickly. This is how diseases can be spread.

Fill all of the small containers halfway with water, except for one of them.
In one container, fill it halfway with hydrogen peroxide.
Instruct the child not to drink any of the contents in these containers!!!
Inform the child that each of these containers represents a single person.
Every time we come in contact with someone (i.e. shaking hands), we get any bacteria or viruses from that person. Also, if someone sneezes and does not cover their mouth, bacteria and viruses can travel through the air and get into our bodies.

Now, have your child pour the liquid from one container into another. They are then to pour half of this mixture back into the original container. This "swapping" of liquids is to occur only five times! They are not to swap with the same people twice.

After swapping the liquids in the containers, inform the child that one of these "people" had a disease and may have spread his disease to the other containers. Ask your child to predict how many other containers have the disease in them. Place one drop of bleach from your eyedropper or straw into each of the containers.If any hydrogen peroxide exists in the container, it will begin to fizz. If the liquid does not fizz, the "person" does not have the disease.

Explanation:

Viruses can spread disease among people very quickly. This activity is very similar to what happens in real life. However, in this simulation your child limited the number of exposures to the disease-carrying container to only five other people. In real life, you may come into contact with hundreds of people.

Day Three: Lab Activity

Today, you and your child will:

1. Review Day One using the following text
2. Run the first activity this week

The following text will give you the most important items to review for your activity today.

When a habitat becomes overcrowded, there is a large amount of competition among the individuals of the population for resources. If this population is limited in the amount of resources that are available to the organisms, there are typically negative effects on the individuals involved.

Famine occurs when there is an absence of natural resources available to a population. This typically means that several individuals within the population will not be able to survive.

Elbow to elbow gardening

Objective:

Children will be able to determine the effects of overcrowding on the growth of living things.

Materials:

one cup of potting soil
three small containers
package of radish seeds
cotton yarn or small strips of cloth
water
nail
small bowl

Procedure:

Use the nail to poke a hole in the bottom of each film canister.
Thread the yarn or cloth through the hole, leaving a small amount in the canister and about 1-3" outside of the hole.
Fill each canister with potting soil.
Poke one hole into the soil of each canister.
Into one canister, plant one seed. In the second canister, plant 3 seeds. In the third canister, plant 10 seeds.
Place all three of the canisters into a small bowl and add a small amount of water.
Place the bowl in a warm, sunny spot.
Have the child make a prediction as to which container will begin to grow their radishes first. Be certain not to let the water in the bowl dry up.
If the area is warm enough, you should see sprouts growing within 48 hours (out of the first canister…hopefully.)

Explanation:

Different plants and animals need different amounts of space to grow well and be healthy. In this activity, the amount of space makes a difference in the growth rate of plants. With 3-10 seeds planted in a single hole, the resources required by each seed is reduced because of the increased competition. The single seed that was planted in the first container should grow first and should grow the tallest. It does not have to share its nutrients.

When the population density in a habitat is increased greatly, it has a negative effect on the individuals in the area. This negative effect can be a famine (which is happening in our container with 10 seeds) or a spreading of disease (which is easy to happen if you have too many people in a small area.)