

# CHAPTER 19

**I**n the past two chapters, you have explored food chains and food webs. But, have you seen any pictures of humans in these drawings? Nope.

**Should they be in there? Of course they should!**

Humans are omnivores, just like bears, bald eagles and foxes! We can get our nutrients from plants or animals! Humans also live in each biome (except for the aquatic biome!) Because of these things, almost all food webs can contain humans. **We are everywhere!**



The **population density** of humans is different in each biome. Population density is a scientific way of saying "the number of individuals of a species in a certain area." You would not find as many humans living in the desert as you would in a grassland or forest. So, the population density of humans living in the grassland or forest would be bigger than in the desert. The biomes that contain the highest population density of humans must have the most natural resources in order for us to survive.

In fact, out of all the species in the world, humans change the environment the most! These changes can cause good and bad things to happen to everyone in the food web.

**In this chapter, you are going to look at some of these “bad things.”**

First of all, there are a lot of humans on the planet...over six billion to be exact.

**6,000,000,000 people! That is a lot of zeros!**

By the year 2050, some scientists think this number will increase to around nine billion!

With such a high population density, humans use up a huge amount of resources from the environment! In many cases, these resources are being used up faster than they can be renewed! This is a large problem!



## Six billion people eat a lot of food, drink a lot of water and breathe a lot of air.

Many scientists think that the number of humans and other organisms in our food web may not be balanced very well! This means that the carrying capacity of the world is not balanced!

Let's look at one example of how our environment may be unbalanced through our soil, water and air...

We will start this journey by looking at plants...

That's right, plants!



DIDN'T THINK  
OF THAT, DID  
YOU?

Most of the  
nutrients we  
eat come from  
plants!

*You may think that the hamburger you ate for dinner is not a plant...and you are correct! But the cow that gave you that hamburger survived by eating nothing but plants! So...the nutrients from the plant were used to grow a cow, and they now help you to grow as well!*

## What do plants need to survive?

They need nutrients from the soil, water, sunlight and air!

But as more people fill up the earth, more space is needed for them to live. **So what happens to the soil?** It has to be covered up with new homes, buildings, parking lots. If the soil is covered up, it cannot be used to grow food for all of these new people. This can be a big problem!

**Now what about the water?** Well, most of the world is covered in water. The aquatic biome is **huge!** But, most of this water we cannot drink!

## What do you mean? There is water we cannot drink?

Most of the aquatic biome is covered in saltwater. This salty water is found in all of the oceans in the world!

Only a very, very small amount of water exists in the world that you and I can drink! Don't get me wrong, there is still a lot of freshwater out there! However, the more people there are, the faster this resource will be used before it can be renewed.





**How about the air?** The more people there are, the more air we need to survive! That makes sense...doesn't it? And here is the really cool part – it's the plants that make the air we need to breathe!

## So what does this mean to us?

You know that plants need soil, right? Well, if we cover up too much soil to make new homes and buildings, we are not going to have very much room for new plants! Without plants, we cannot get the air that we need to breathe. This is a huge problem! Also, our carrying capacity would be unbalanced without plants because they are in every food web.

# So what have we learned here?



The more people there are, the more water we use. And, more soil is covered up. Without soil, we have no plants! Without plants, we have no air! And, without plants, we have no food!

The more humans that are born into the world, the more unbalanced our food web becomes.

# Don't give up hope yet!

The population density of all animals, including humans, can increase or decrease! In nature, the population density for all animals will increase until something slows it down.

## But what can slow down a population that is growing so large?

The two factors that can affect a large population are:

# Famine and Disease

**Famine** is a time when many consumers go hungry and don't have enough food to eat. If this happens for too long, many organisms can die. Famine happens when the consumers eat

up most of their resources within their habitat.



Another problem that happens when too many organisms live in one habitat is **disease**. When an organism is said to have a disease, it means it is sick! There are all kinds of disease that can affect a population.



Sometimes, these diseases come from harmful eubacteria or **viruses** that get into their bodies.

A **virus** is a small organism that can cause disease. Viruses are smaller than any eubacteria, but they can do just as much harm! Unlike eubacteria, viruses cannot live on their own! They have to live within another

organism! There are ways of keeping viruses out of your bodies. You'll learn about this in the next chapter...



**You will also explore how people work everyday to keep our carrying capacity balanced in the next chapter!**

# Unscramble the words below:

1. feamni \_\_\_\_\_
2. iolepaspyunnotidt \_\_\_\_\_
3. aseids \_\_\_\_\_
4. suevris \_\_\_\_\_

## Write the definitions for each word:

1. \_\_\_\_\_  
\_\_\_\_\_
2. \_\_\_\_\_  
\_\_\_\_\_
3. \_\_\_\_\_  
\_\_\_\_\_
4. \_\_\_\_\_  
\_\_\_\_\_

Match the words in the first column to the best available answer in the second column.

\_\_\_\_\_ Population  
\_\_\_\_\_ density

1) a collection of chemicals  
that can spread disease

\_\_\_\_\_ Famine

2) a scientific way of saying  
"the number of individuals  
of a species in a certain  
area"

\_\_\_\_\_ Disease

3) A time when lots of people  
go hungry and don't have  
enough food to eat

\_\_\_\_\_ Viruses

4) a sickness

## Which one is right? Circle the correct answer.

1. The population density of humans would be the largest in which of these biomes?

  - a. grassland
  - b. desert
  - c. aquatic
2. Most of the nutrients that humans need come from:

  - a. animals
  - b. plants
  - c. the ocean
3. Freshwater is an important resource because \_\_\_\_\_.

  - a. the aquatic biome is mostly freshwater
  - b. very few organisms need freshwater to survive
  - c. the amount of freshwater is very small
4. Famine and disease can cause population density to \_\_\_\_\_.

  - a. increase
  - b. decrease
  - c. stay the same
5. The best way to protect you from disease is by \_\_\_\_\_.

  - a. reduction, reusing and recycling
  - b. covering your mouth when you sneeze
  - c. washing your hands
6. The number of humans in the world is over \_\_\_\_\_ billion.

  - a. six
  - b. nine
  - c. ten