CHAPTER 5

In the last unit, you discovered **how** organisms live. Now you are going to start looking at **where** these organisms live! There are many areas in the world that have a similar...

Temperature
Amount of rainfall
Kind of soil
Habitat

There are so many of these areas, that scientists have placed them into groups called...

("by-omz")

There are several different biomes around the world:

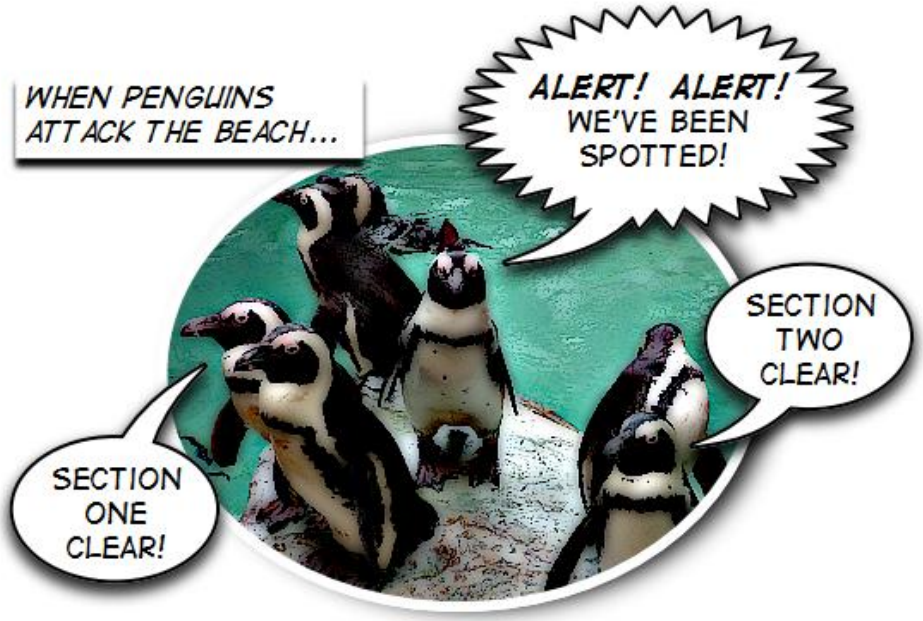
Grassland biome
Deciduous forest biome ("dee-sid-u-us")
Tropical rain forest biome
Coniferous forest biome ("con-if-er-us")
Tundra biome
Desert biome
and **Aquatic biome**

Remember... each of these biomes have habitats that allow organism to survive in them. Population of organisms that live in the desert could not live on a mountain, or under the sea, or in a forest...

For example, have you ever seen a picture of a penguin searching for nuts and berries in a forest?

Of course not!

Penguins have a thick layer of fat that keeps them warm since they live around the south pole of the earth where it is really cold! Also, You wouldn't find them in a forest since they do not eat nuts and berries... they eat fish!



Let's start looking at the first two biomes...

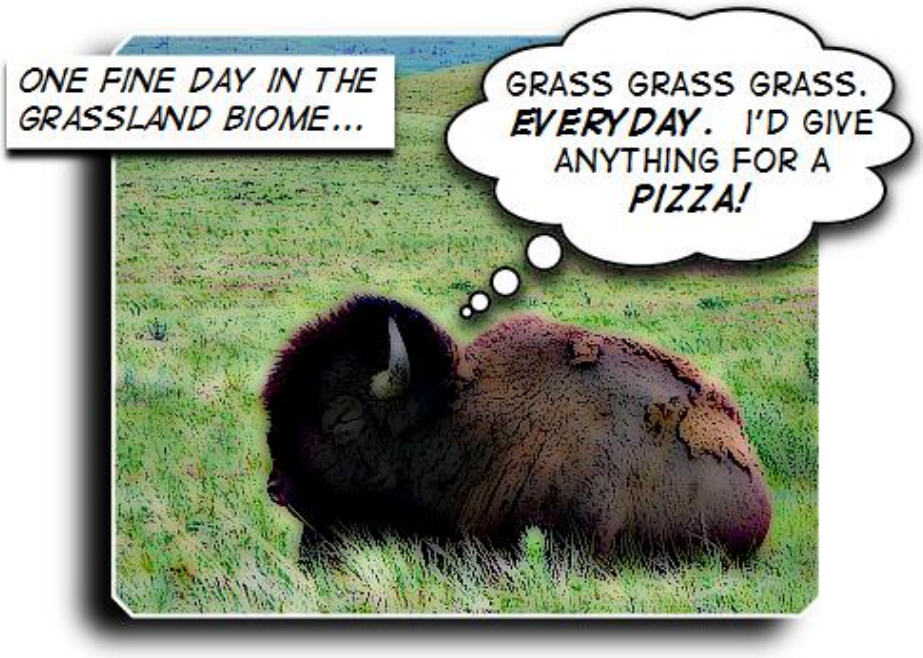
The grassland biome is full of... yes! You guessed it... **Grasses**

You can't find many trees in a grassland. Why? Because there is not enough rain to keep trees alive in this biome! There is plenty of rain for a tree to grow during the wet season. But there is not enough rain to keep it alive during the dry season.

Grasses do not need as much rain as trees do. So, even during the dry season in this biome, these organisms can survive.

There are two types of grasslands:

Tropical grasslands
and
Temperate grasslands



Tropical Grasslands are hot all year long. These grasslands have a large amount of rain during their wet season. This area receives 10-20 inches of rain per year.

Temperate grasslands have hot summers and cold winters. It usually freezes during the winters in temperate grasslands. This grassland does not receive as much rain as tropical grasslands.

Most of the animals that live on a grassland are used to dry seasons. Water can be hard to find during the dry season. Animals look for Water in lakes, ponds and streams.

In the grassland biome, many animals **burrow** (a fancy word for "dig") underground to make their homes. Prairie dogs and groundhogs are examples of animals that make their home under the ground. Animals that make their homes underground are protected from other animals and the weather.

Grazing animals can also be found on the grassland. These are animals that do not burrow, but eat the grasses in this habitat. Cows and buffalo are examples of grazing animals.

The soil in the grassland biome is very **fertile**. This means there are plenty of nutrients in the soil. This makes it very easy for plants to survive!

It is too bad that there is not enough rain throughout the year, or you would find a lot more trees in this biome.

Now… on to our next biome:

The Deciduous forest

I would guess that many of you have seen a deciduous tree. How? Because a deciduous tree…

…loses its leaves in the fall!

This biome is named the "deciduous forest" because most of the land in this area is filled with deciduous trees! The deciduous forest biome has all four seasons – summer, spring, fall and winter. A deciduous forest also gets a lot of rain!

Up to 60 inches a year!

With so many leaves falling onto the ground, the soil of a deciduous forest has a lot of nutrients! This kind of soil is very good for growing food! Like the grassland, this soil is very fertile.

What kinds of animals do you find in this biome?

Many of the animals in this biome eat the fruits and nuts from the trees of the forest. Deer, squirrels and mice are usually found in this biome. Other animals like frogs and snakes can also be found here!

During the winter, it gets cold and icy. Some animals **hibernate** during this time. This means they sleep through the winter. Since they are asleep, they do not need many resources to survive! This is very helpful when most of the land is covered in snow at this time, and much of the food cannot be easily found.

Frogs usually hibernate during this time... so do some snakes, bears and other animals!

Circle the hidden words from below:

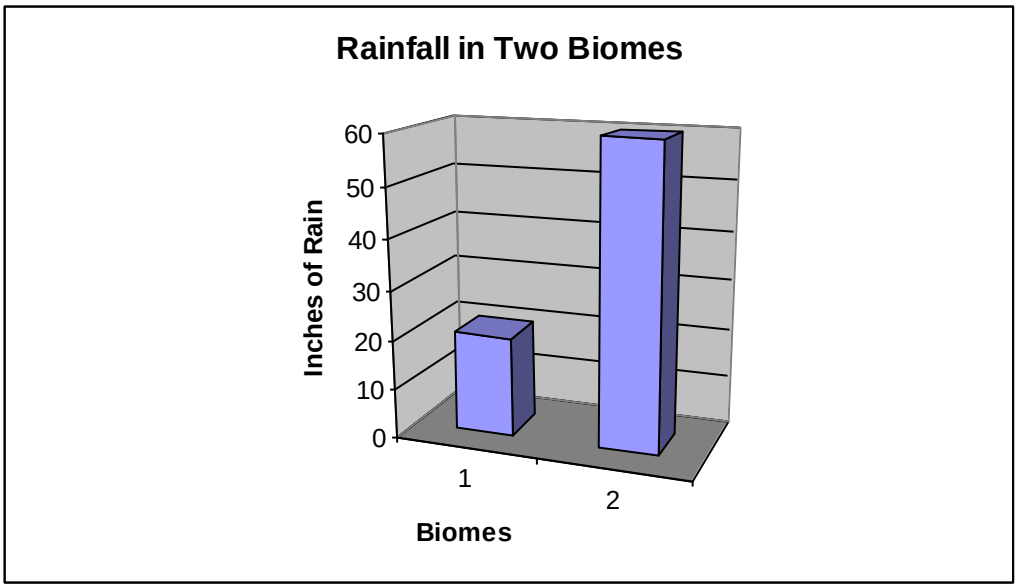
O D L I N B T V O R D E D D O
C T E E M S O E W P M N T J N
S F R C E Y U K T D A R R R W
A C C R I U F R B L S H B N C
J L O S U D O I S S D I W K A
N F W B E P U S B T N B O C V
M K W S I M A O P C A E R V A
I A Y C D R O W U K L R R C U
T J A Q G H H I U S S N U J L
E L I T R E F D H R X A B U A
T E M P E R A T E Y A T S O L
R W B I O M E F N U R E P Y U
W A A T L J F O Y X G J A J W
K M K Q Q M Q K B G L W E Q J
G X F R N T S E B H S I G Y L

BIOME
DECIDUOUS
GRASSLAND
TROPICAL
FERTILE
TEMPERATE
BURROW
FOREST
HIBERNATE

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

_____ Biomes	1) to sleep through the winter
_____ Grassland biome	2) having plenty of nutrients in the soil
_____ Tropical grasslands	3) grasslands which are hot all year long
_____ Temperate grasslands	4) a biome that has good soil for many different kinds of grasses and few trees
_____ Burrow	5) areas of the world that have the same temperature/amount of rainfall/kind of soil and habitats
_____ Fertile	6) to dig
_____ Deciduous forest biome	7) a biome that is filled with trees that lose their leaves in the fall and have four separate seasons
_____ Hibernate	8) grasslands which have hot summers and cold winters

While studying the rainfall in the deciduous forest and grassland biomes, Colton forgot to label his graph. He knows that the two biomes can be found in your reading from today. Can you help him?



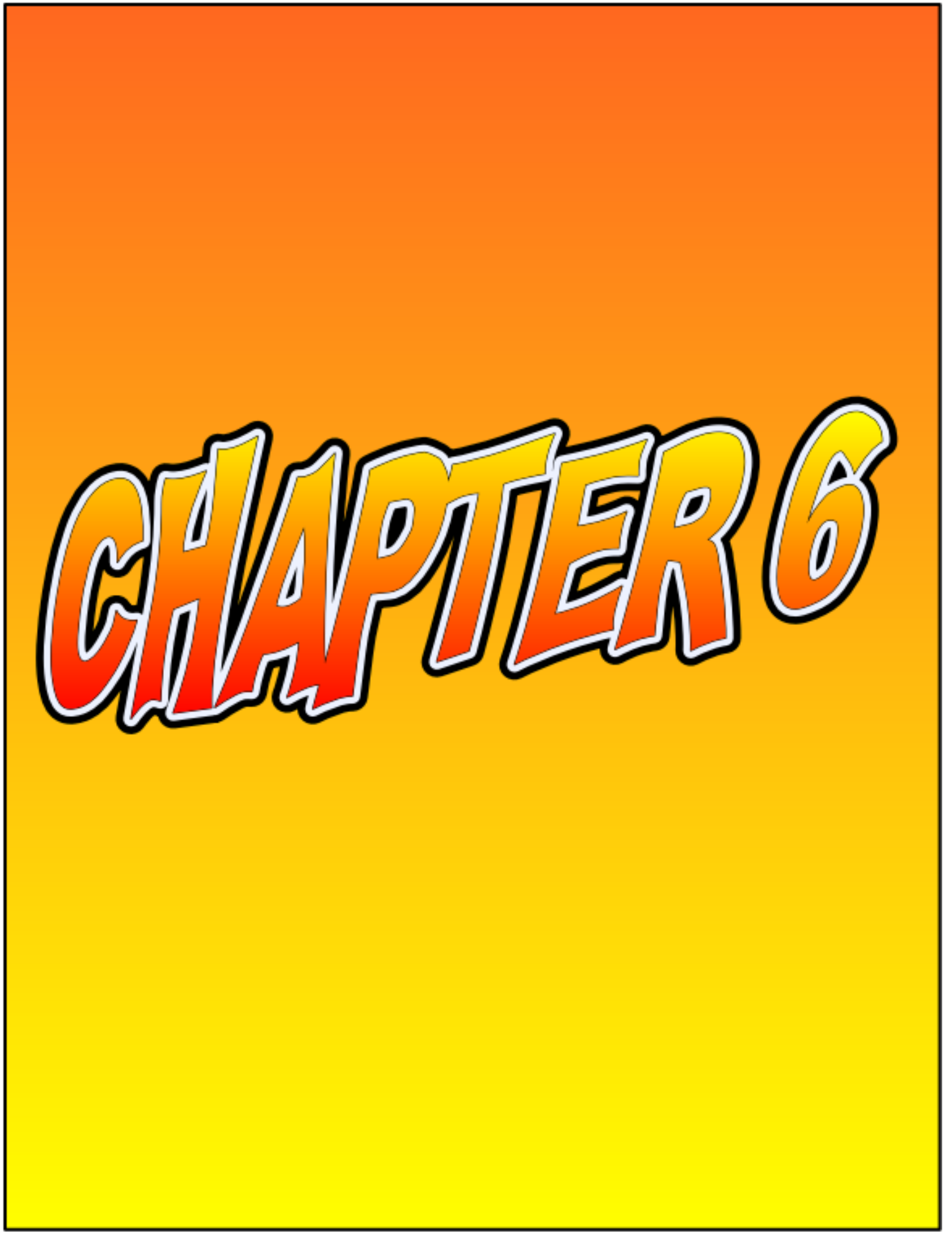
Which biome on this graph should be labeled?

Biome #1 _____

and

Biome #2 _____

Why do you think your answers are correct?


CHAPTER 6

In the last chapter, you learned about the rainfall, temperature, soil and living organisms of two biomes: grasslands and deciduous forests.

A deciduous forest is not the only kind of forest biome. You are going to look at two more kinds of forest biomes in this chapter:

Our first forest you will study this week is called...

(This is a another tricky word. Try saying "con-if-er-us")

Most of the water that the trees get in this biome comes from snow! This is because winters in the coniferous forest are long and cold with up to three feet of snow per year. The summers are short with small amounts of rainfall. During summer, the trees get plenty of water from all of the melting snow.

The soil in this biome is not very good for growing many kinds of plants. It is very thin and rocky.

You might be thinking...

If the soil is not good for growing many kinds of plants...

...then why are there so many trees in this biome?

Good question... The kind of tree you usually find in this biome is known as a **conifer**.

Conifers do not need a lot of water and nutrients to survive. Also, conifers do not have big leaves. Instead, they have short waxy needles! Conifer trees do not lose their leaves (needles), unlike a deciduous tree! This is very important because the needles help make food for the tree! These needles also help to store water and nutrients the tree can use during the long, cold winters.

But if a coniferous forest is cold most of the time, how do conifer trees get their water in the winter?

Remember that most of the trees in this biome get their water from melted snow. The needles are covered in a kind of wax. This wax helps to store water and nutrients in the needles for the tree to use later.

Conifers do not make any fruits (like apple trees and orange trees). Instead, they make cones. Have you ever heard of a pinecone before? A pinecone is the seed that will grow another conifer tree.

I would guess that most of you have seen a conifer tree before. Have you ever seen a Christmas tree? This type of tree is a conifer! Conifers are also known as **evergreens**. They get this name because their leaves (needles) stay green all year long!

We've spent a lot of time talking about the plants in this biome.

What about the animals in these biomes?

The animals that live within this biome are used to the long cold winters. Foxes, chipmunks, moose and bear all live within the coniferous forest.

Most of these animals in this biome hibernate during the winters. Food is hard to find when there is so much snow on the ground! Before they hibernate, animals must eat as much food as they can so that they can store this food in their bodies during their long sleep during the winter months. Since the summers are so short, many animals move around a lot in search of food during this time to get ready for winter!

The next biome we will explore today is also a kind of forest:

The tropical rain forest is different from the deciduous and coniferous forests in many ways!

- This biome is warm all year long with no winters!
- Up to twenty feet of rain falls during the year. This is much more than any other biome!
- Many plants found in this biome are used in medicines we use!

The tropical rain forest is filled with very large trees that cover most the land. The leaves of these trees are large and spread out over most of the land. There are so many trees in this biome, that these large leaves shade the ground below. So, the kinds of plants you find on the ground do not need a lot of sunlight. An example of this kind of plant is a fern.

You may be thinking that the soil must be full of nutrients for so many different plants, right? **Wrong!**

The soil in the tropical rain forest is very thin, much like the coniferous forest. However, the soil is not as rocky in the tropical rain forest.

Because there is so much rain in this biome, most of the nutrients are washed away! Plus, most of the nutrients that are in the soil are quickly taken in by the large trees. The smaller plants do not need a lot of nutrients to survive.

There are a huge number of animals that live in the tropical rain forest!

The tropical rain forest is home to more kinds of plants and animals than any other biome! Since the weather is always warm, animals do not have to hibernate. And with so much food and water in this biome, animals do not have to move around very much. All of their resources are nearby!

Many of these organisms are used to living within the trees, like monkeys, birds and all kinds of insects. In fact, insects make up the largest number of animals within the tropical rain forest!

Many animals in this biome are brightly colored (scientists are not sure why!) and eat a lot of fruit to survive. Most monkeys, birds and insects can live off of fruits as their source of nutrients to stay alive!

If you are looking for the **largest** animals in this biome, you will look on the ground. Here you will find gorillas, hippos and tigers!

Next week, you are going to look at two more biomes that are really different from what you have been exploring...

The table below contains words and phrases that have been chopped in half. Find the pieces that fit together and write them in the answer area below.

fers	rain forest biome	tropical	coniferous
reens	coni	forest biome	everg

Answers:

1) _____

2) _____

3) _____

4) _____

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

_____ Coniferous forest biome	1) a biome that is always warm and has a lot of rainfall; this biome contains a huge amount of different kinds of plants and animals
_____ Conifers	2) trees with short and waxy needles instead of leaves which make seeds that are called "cones" (like pinecones)
_____ Evergreens	3) a biome that has long winters and is filled with trees known as conifers
_____ Tropical rain forest biome	4) plants with leaves that stay green throughout the winter

Many animals that live in the tropical rain forest spend their entire lives in the trees. Some of them never even touch the ground!

What do you think it would be like to live in the trees for your entire life? What would you need to be able to do if you could never touch the ground again! Be creative!

CHAPTER 7

So far, you have looked at grasslands and three different types of forests: deciduous, coniferous and tropical rain forests. Now you will study two more biomes:

and

("tun-dur-ah") ("dez-urts")

The **tundra** is the coldest biome that is on the planet! Because it is so cold, very few plants and animals live here.

In fact, there are no trees in the tundra!

It is so cold in the tundra that the top layer of soil is almost always frozen!! This layer of frozen soil is known as **permafrost**.

This soil is also very low in nutrients. Plants that grow in the tundra are usually very small. Their roots may take hundreds of years to grow because of the poor habitat!

If any of these plants could grow tall, they would probably be knocked down by the powerful winds that sweep over the tundra.

Are you getting the idea that the tundra is not the best place to live?

The tundra can be split into two different types:

Arctic and Alpine

The **Arctic** tundra is found around the North Pole. It is always cold and the permafrost stays frozen all year long!

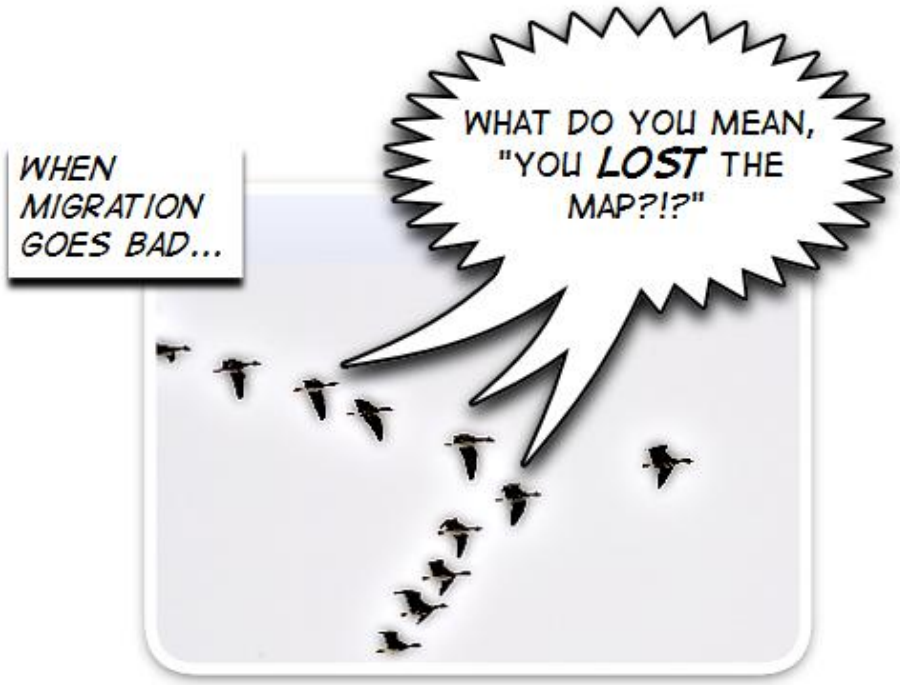
Polar bears, caribou and wolves are the largest animals you would find in this biome. These animals spend the short summers eating as much as they can. The more they eat, the more fat they put on their bodies!

But I thought fat was bad for animals?

Not these animals!

The extra fat protects the animal from the cold weather. This is the same as you wearing a thick coat in the winter! The extra layer of fat on the animal works the same way as your thick coat... it keeps you warm! This form of protection is very important for animals on the tundra. But With so little resources in this biome, many animals still hibernate during the long cold winters.

Other animals choose to leave this biome during the winter months. This is known as **migration** ("my-gray-shun"). Many different birds migrate from the tundra when it gets too cold. Ravens and falcons are two kinds of birds that migrate from the tundra during the winter. They travel south from the North Pole, towards warmer areas. These birds return to the tundra during the summer.



The **alpine** tundra is found on the tops of mountains all over the world. If you look on the top of a mountain, you will see a large area where no trees are growing. This is the alpine tundra!

The alpine tundra is almost always:

Cold, snowy and windy

This biome gets more snow than the arctic tundra every year. But it also gets a little warmer during the summer.

The layer of permafrost is not as thick in the alpine tundra. In the summer, the top layer of permafrost thaws just enough to let plants to grow... but they do not grow very fast at all! This is because many plants do not grow fast when it is very cold outside. Also, many plants cannot live when there are strong, cold winds blowing all of the time.

The plants that grow here are the same kinds you would find in the arctic tundra. However, the soil is a little better here, but not much. The soil still does not have many nutrients!

Animals in the alpine tundra are similar to animals in the arctic tundra. Many animals burrow into the ground to keep warm like foxes and ground squirrels. Some animals migrate to warmer areas. And, the larger animals, like elk and mountain goats, are always eating to put more fat on their bodies!

You would find some animals in the alpine tundra, like the bighorn sheep, that have very strong legs. This is needed to climb the rocky hills that are found in this area.

The alpine tundra is a rough place and the plants and animals that live here have to be prepared to survive!

The next biome you will be looking at is the...

Deserts may be the hardest biome to live in! Many of you have a picture in your mind of what a desert looks like.

But did you know that it can be very hot during the day and freezing cold at night?

It is true that **deserts** are hot during the day and very cold at night.

There is not a lot of water in a desert. So there are very few plants in this biome. The most well known desert plant is the cactus. This plant has a waxy covering all over just like the needles on a conifer tree! The cactus uses this waxy covering to keep water inside when there is no water.

The soil in a desert is made up mostly of sand. There are very few nutrients in the soil of a desert!

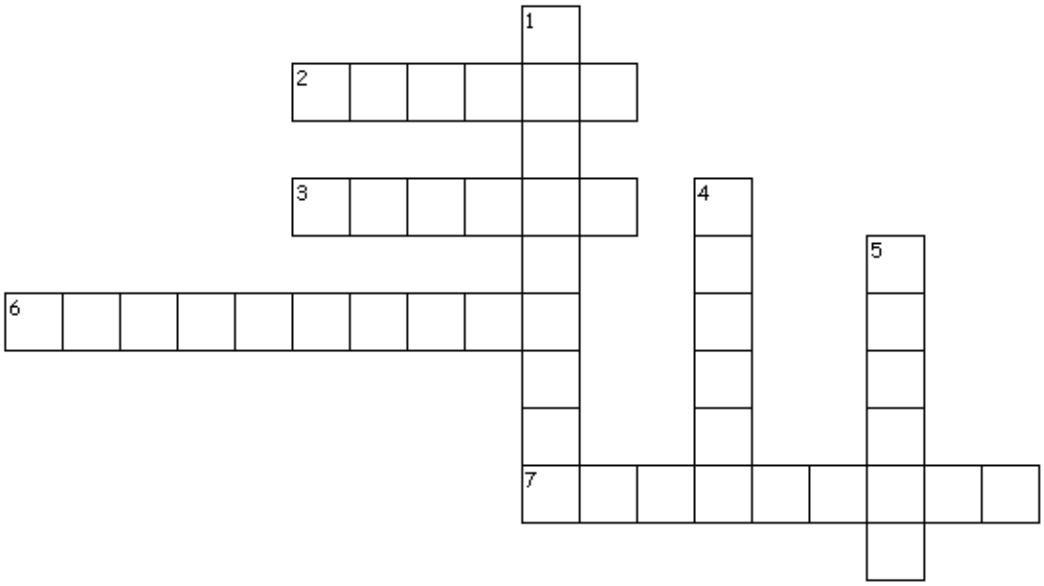
Most animals that live in a desert are very small. A desert does not have a lot of resources so they do not tend to grow very large.

Many of these animals burrow into the ground during the day to avoid the very hot temperatures. Most animals in the desert are **nocturnal**. An animal that is nocturnal will sleep during the day and wake up at night. This is because it is much cooler at night. Also, animals do most of their hunting for food during this time.

That's right! They get to sleep in all day long! But this is not a treat. It is very, very hard to live in a desert. Animals in a desert wake up to a very cold evening almost every night and search for food! Most of these animals do not need to drink much water because they get their water from the food they eat.

The tundra and desert are the most dangerous biomes because resources are hard to find and the temperatures are very cold or very hot!

Place the answers to the following clues in the boxes below. Each box should contain one letter.



Across

2. a tundra that is found around the north pole
3. the coldest biome on the planet; contains no trees and very few different kinds of plants and animals
6. a layer of frozen soil usually found in the tundra
7. being able to sleep during the day and wake up at night

Down

1. an action by animals in which they leave a biome during the winter months and return in the spring
4. a biome that has very hot days and cold nights with very little water and few organisms
5. a tundra that is found on the tops of mountains

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

_____ Tundra biome	1) an action by animals in which they leave a biome during the winter months and return in the spring
_____ Permafrost	2) a tundra that is found around the north pole
_____ Migration	3) a layer of frozen soil usually found in the tundra
_____ Alpine tundra	4) the coldest biome on the planet; it contains no trees and very few different kinds of plants and animals
_____ Arctic tundra	5) being able to sleep during the day and wake up at night
_____ Desert biome	6) a biome that has very hot days and cold nights with very little water and few organisms
_____ Nocturnal	7) a tundra that is found on the tops of mountains

Compare and Contrast

the

Tundra biome and the Desert biome

Compare (things that are the **same** between the two biomes)	Contrast (things that are **different** between the two biomes)

CHAPTER 8

In the past three chapters, you have explored six biomes that exist on land. Now you are going to study a biome that is underwater!

Out of all the resources that are on our planet, **water** is the most important of them all! From grasslands to deserts, it is the amount of **water** that affects plant and animal life the most! Without this resource, we would not be able to survive!

The **aquatic biome** can be split in two different groups:

Freshwater (ponds, streams, lakes and rivers)

and

Marine (saltwater - like the ocean!)

Let's take a look at freshwater habitats...

Freshwater habitats include ponds, streams, lakes, rivers and wetlands. These areas are called "freshwater" because of the low amount of salt in the water.

Lakes and **ponds** are bodies of water completely surrounded by land. What makes these two freshwater habitats different is size. Lakes are large areas of water and can exist for hundreds of years. Ponds are much smaller, and can dry up much earlier.

Lakes and ponds are home to many kinds of organisms. Most plants that live in lakes and ponds need large amounts of water to stay alive. These kinds of plants, like cattails, can be found on the banks of a lake or pond. A kind of tree you can find in this area is known as the willow tree.

Also, some plants in these areas must grow **inside** the lake or pond in order to stay alive! Lilly pads are a good example of plants that grow inside a lake or pond.

The animals that live in these areas spend a great deal of time inside of the water. These animals include fish, frogs and many insects. Reptiles and amphibians can also be found in these areas as well! You can usually find lots of animals that live near a large source of water. Since water is a resource that all animals need to survive, a pond or lake is a good place to live!

Lakes and ponds are almost always deeper than another body of water... **wetlands**.

Wetlands are large areas of shallow water, like swamps. There are many different animals that live in a wetland:

Alligators
Ducks
Snakes
Turtles

Wetlands are important to animals because they:

- Provide plenty of shelter for animals
- Provide migrating birds an area to rest and gather food
- Have a lot of food for animals

Other freshwater habitats include **streams** and **rivers**. These are bodies of water that move in one direction. Many rivers and streams begin from the snow on a mountain. When this snow melts, the water runs down the mountain as a small trickle. This small trickle gets larger as more water flows into the running water.

The temperature of these habitats is cooler at the beginning of the stream or river.

Streams and rivers provide resources for many kinds of organisms. Certain kinds of organisms can only survive within these habitats. To be even more specific, some organisms can only live in specific areas along a stream or river!

This is because the amount of resources within a stream or river changes from where it begins to where it reaches the ocean.

You mean that all rivers and streams reach the ocean?

Yes I do!

All rivers and streams end up flowing into oceans all over the world! We call the places where the rivers and streams meet the ocean **estuaries** ("es-two-air-eez").

Estuaries are a different kind of habitat. Only certain kinds of organisms, like worms, crabs and oysters, can live in these areas because of the freshwater mixing with the saltwater.

Estuaries are the doorways into the largest biome of the world:

Oceans

Oceans are **HUGE** bodies of salt water! The salt that is found in oceans comes from the bottom of the ocean floor.

Oceans are the largest biome in the world!

The oceans have different areas of warmer and colder water, just like ponds and lakes. The closer you get to the north and south poles, the colder the ocean is. The closer you get towards the middle of the earth (known as the equator), the warmer the ocean is.

Whales, dolphins, sharks, sea stars, sponges...all can be found in the ocean! You may think that there are more kinds of plants and animals in the ocean than anywhere else...

...but this is not true!

The oceans are very large and they are filled with many plants and animals. However, there are not many different species of plants and animals in this biome.

You have looked at a lot of biomes in this unit. This table will help you remember some of the important facts...

	Temperature	Water	Soil	Plants and animals
Grassland	Hot (and maybe cold)	Wet/dry season	Good nutrients	Many organisms
Deciduous forest	Hot summers, Cold winters: All four Seasons	Plenty	Good nutrients	Many organisms
Coniferous forest	Mostly cold	Plenty	Poor, rocky soil	Many organisms
Tropical rain forest	Always hot	Very wet	Poor, thin soil	Many organisms
Tundra	cold	Very dry	Poor, frozen	Migrating birds
Desert	Hot or cold	Very dry	poor	Few organisms
Aquatic	Hot to cold	Always wet	No soil	Many organisms

Circle the hidden words from below:

W E M E P O C S E R K C R J J
S E N U H M T Y E L A K E S R
J I T I A R K T A M L K I E S
R E F L E Y A C Q M U Y M E N
J C F A A W U K U P I O W G A
F H M W H N E S A R I P Y S E
G S M S Z U D N T B I I G T C
S R E U L W A S I T Y L D G O
D R D Q B Z X S C R F T A C Z
F A Y L Z B W T V L A C D R B
P C X F C S R E V I R M G U W
P O Q K H Z E S T U A R I E S
A B N Z X I X J O F W V Z S P
K O M D V Z Q M C U R B Q S P
K N S Y S N X H A Z Q G I Z I

AQUATIC
BIOME
ESTUARIES
FRESHWATER
LAKES
MARINE
OCEANS
STREAMS
WETLANDS
PONDS
RIVERS

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

_____ Aquatic biome	1) small bodies of freshwater moving in one direction
_____ Freshwater	2) large areas of shallow water; also known as swamps
_____ Lakes	3) these habitats include ponds/streams/lakes/rivers and wetlands
_____ Ponds	4) a biome that includes all organisms that live within fresh water or salt water
_____ Wetlands	5) large bodies of freshwater moving in one direction
_____ Streams	6) small bodies of water that are surrounded by land
_____ Rivers	7) saltwater habitats
_____ Estuaries	8) the largest marine biome in the world
_____ Marine	9) large bodies of water that are surrounded by land
_____ Oceans	10) areas where rivers and streams flow into saltwater habitats

Unit Two review

Fill in the blanks in the table below from your reading.

Biome	Temperature	Water	Soil	Plants and animals
Grassland				
Deciduous forest				
Coniferous forest				
Tropical rain forest				
Tundra				
Desert				
Aquatic				

Be certain to go over your definitions for the test!