2020

Erie Rise Leadership
Academy Charter School

Parent Lesson Plan

[PARENT LESSON PLAN]

7th Grade, Week of 4/6

Contents

INTRODUCTION

Hello Parents!

Included in this packet is a week's worth of printed ELA, Mathematics, and Science/Social Studies work for your students while they are at home. Each day is separated into the 3 content areas for the printed material. If you have access to the digital curriculum, a pacing guide is also provided outlining the digital component assigned for each specific day. If you need technology, please contact the school and we can make it available to you. Also remember, USATestPrep is always an option!

We know some of this material maybe be challenging, but try your best to complete it! Hopefully we will see you back in the classroom soon and will be able to go over all the information.

Printed materials may be turned into to the distribution centers once completed, but it is not a requirement.

Mrs. Will will be available on Youtube Live every day from 10AM-11AM to assist with curriculum questions and/or any resource questions for parents or students.

Stay safe and healthy everyone!

Missing seeing everyone's smiling face! Remember to wash your hands!

Educationally Yours ,
Mrs. Veronica Will

HELPFUL INFORMATION

Distribution Sites/Information

Food/Curriculum distribution will take place at:

Erie Rise Leadership Academy Charter School
1006 West 10th Street
Erie, PA 16502

Monday and Wednesday from 9AM until 12PM

Leadership Team

Mr. Terry Lang, CEO: 814 812-0503
Mrs. Veronica Will, Principal: 814 873-5158
Mr. Aubrey Favors, HR: 814 812-3026
Mr. Kirk Paskell, Transportation: 814 566-0002
Mr. Homer Smith, PR: 814 392-3413
Mrs. Pearl Jeffries, Social Services: 814 722-5056

DIGITAL LESSON PACING GUIDE

ConnectED Instructions

Please see attached instructions for accessing the digital curriculum.

USATestPrep Instructions

Please see attached instructions for accessing this test-prep site.

If you have access to high speed internet, below are the assignments the teachers have assigned for the various content areas:

Digital Pacing Guide

	Monday	Tuesday	Wednesday	Thursday	Friday
ELA/Writing 7th and 8th grade	Connect Ed. First Read "The Others" Complete: Vocabulary, Read, Using Language and Access activity 1	Khanacademy.org Complete: Key Ideas-Creative Fiction "The Boy in The Painting"	Connect Ed. Re-Read "The Others" Complete: Vocabulary, Read, Using Language and Access activity 1	Khanacademy.org Complete: Key Ideas-Realistic Fiction "One Big Mess"	Complete any work that has not been completed.
Math	USA Test Prep Class Dojo	USA Test Prep Class Dojo	USA Test Prep Class Dojo	USA Test Prep Class Dojo	USA Test Prep Class Dojo
Science	Complete USA Test assignments	Complete USA Test assignments	Complete USA Test assignments	Complete USA Test assignments	Complete USA Test assignments
Social Studies	Connect Ed- "Monday April 6-Wednesday April 8"	Connect Ed- "Monday April 6-Wednesday April 8"	Connect Ed- "Monday April 6-Wednesday April 8"	USA Test Prep- "April 9th- Alimahmoodi"	USA Test Prep-"Friday April 10th- Alimahmoodi"

ELA- Mrs. Norgard

Monday 4/6 Read "Columbus and the Egg" Complete the activities at the bottom.
Tuesday 4/7 Read "A Good Student" Complete the activities at the bottom.
Wednesday 4/8 Read "City or Country" Complete the activities at the bottom.
Thursday 4/9 Read "I Like Plants" Complete the activities at the bottom.
Friday 4/10 Read "Johns Bright Idea" Complete the activities at the bottom.

If you have any questions, you can reach me at knorgard@erieriseacademy.org or on my cell phone at (910) 988-7997. Missing you!!

MATH PRINT MATERIALS

GRAYSON-WAYNE

3 Printed Workaheets from USATest Prep

Chapter 7 Packets

Coach PSSA Practice Packets
Chapter on Angles

*****Please complete 1-2 lessons per day day along with USATest Prep assignments.**

8148449220 Texts only please

Daily Class Dojo Check Ins

SCIENCE/SOCIAL STUDIES PRINT MATERIAL

Social Studies-Alimahmoodi:

*The packet provided is arranged in the order that it is to be completed.

Chapter 18: Civilizations of Korea, Japan, and Southeast Asia

Day 1 (Monday 4/6)

1. Complete the end of unit Assessment
    a. Please use all materials you have used and completed up until now to assist you.

Day 2 (Tuesday 4/7)

1. Read the article "First Ladies of the World"
2. Answer the questions that follow

Day 3 (Wednesday 4/8)

1. Read the article "Cherokee in the United States"
2. Answer the questions that follow

Day 4 (Thursday 4/9)

1. Read the article "The Astronaut Wives Club"
2. Answer the questions that follow

Day 5 (Friday 4/10)

1. Read the article "California"
2. Answer the questions that follow

Monday- Life history strategies

Tuesday- Population size, density, & dispersal

Wednesday- Life tables, survivorship, & age-sex structure

Thursday- Thursday-Population Ecology-Test

Friday- How to protect yourself from Coronavirus disease

Wordsearch/Quiz

ADDITIONAL RESOURCES (EDUCATIONAL)

Included are a list of hand selected resources for students with internet to use at home.

Khan Academy
USA Test Prep
Connect Ed
Study Syn

Columbus and the Egg

CCSSR1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
Includes questions you can ask about any story.
Story Source: Public Domain, adapted by Center for Urban Education
By James Baldwin (Adapted) From Thirty More Famous Stories Retold.

This is a story about Columbus, the explorer who "discovered" America. We have put "discovered" in quotation marks because actually other people already lived on the continent long before Columbus made his voyage in 1492. This is a story about what might have happened long ago when he was back in Spain. Is it accurate, did it really occur? That's not known, but it is a story that could have happened. Stories such as this are passed from generation to generation and sometimes are based on facts.

When Columbus came back from his trip to the Americas, many people praised him. He was made an admiral, he had made a remarkable voyage despite many challenges. People said what a great thing he had done, discovering the Americas. However, not everyone appreciated him, there were some who were jealous of all the adulation

One day Columbus was at a party that a Spanish gentleman gave in his honor. People were saying, "What a great discovery you have made!" Several persons were present who resented this great admiral's success. They were proud and conceited, and they very soon began to try to make Columbus uncomfortable.

"You have discovered strange lands beyond the seas,'" they said, "but what of that? We do not see why there should be so much said about it. Anybody can sail across the ocean; and anybody can coast along the islands on the other side, just as you have done. It is the simplest thing in the world. All you need to do is sail West, that's not a remarkable feat."

Columbus made no answer; but after a while he took an egg from a dish and said to the company: "Who among you, gentlemen, can make this egg stand on end?"

"That's impossible," the host replied. "You would need to be a magician to do that." One by one those at the table tried the experiment. When the egg had gone entirely around and none had succeeded, all said that it could not be done, it was defying gravity.

Then Columbus took the egg and struck its small end gently upon the table so as to break the shell a little. After that there was no trouble in making it stand upright.

"Gentlemen," said he, "What is easier than to do this which you said was impossible? It is the simplest thing in the world. Anybody can do it—AFTER HE HAS BEEN SHOWN HOW!"

Write your answers to these questions on another page.

1. Sequence: Which event happened first? Which happened last?
2. Character Traits: Name one character. What is one trait you infer that character has? Explain why you think that.
3. Motive: What is something that person does? Why do you think that person does that?
4. Summarize: Summarize the story in four sentences. Tell about the characters and what they do.
5. Main Idea: What do you think is the main idea of the story? Why?

A Good Student

CCSSR1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

I was extremely glad I had been to the freshman orientation. The high school was tremendously large, so the orientation helped me immensely. I figured out where my classrooms were located, and I was also able to meet some of the teachers. I even had a new friend. I met another student who was really interested in sports, like me, and we were both going to try out for the basketball team. I really hope we make the team.

Today was my first day, and it was very difficult. We only have four minutes to get from one class to another. Even though I knew where the classrooms were, I still had to manage to get from one end of the building to the other in that short amount of time. I wanted to go to my locker and drop off my book, so I did just that. However, that took some time, and I worried about being late. Unfortunately, I did end up arriving late to my math class. My math teacher told me, "Just be on time tomorrow, because I know you are finding your way, but that's it. I am serious—only one late-to-class is allowed. After that, you must go to the office to request a pass, and I will mark you tardy. Once you are tardy three times you must serve a detention."

I really enjoyed my art class that first day. The teacher showed us how to create portraits. We just made drawings today, but I know it's going to be a wonderful class. While I very much enjoy drawing, I had no idea it was so closely related to math. I divided my page into equal sections, using a ruler, and then worked on my sketch.

I like my English class, too. Today we wrote about ourselves. The teacher said to just write what you think in the form of a paragraph or a poem, and that we will focus on grammar later. I composed a poem about myself, and I believe it is a good poem.

Lunch was particularly hurried. I went to my locker first before rushing to the cafeteria. I scanned the cafeteria for my friend, but he wasn't there, so I sat with people I hadn't met. Everyone was eating very quickly. There were several lunch choices, but tomorrow I will choose differently. The food I got today looked tasty, but I didn't like it very much.

There is an after-school club I can join. It is a club for people who want to learn more about computers, and I think I'll sign up. But there is another club after-school that interests me, too: the chess club. I enjoy playing chess. I also need to learn how to use a computer. My social studies teacher claims it is the one skill you need to learn every subject. My English teacher said the one skill I need in every class is writing. I think I need both skills. So many possibilities—it's going to be a good year.

These are questions you can ask and answer about any story. Write your answers on another page.

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City or Country—A Mouse Chooses—A Fable

Source: Based on a public domain resource, there are many variations on this story. We have updated it including changes in plot and characters' identities, but the moral is the same.

Jerome, a mouse who lived in the country invited his cousin Don, a mouse who lived in the city to visit him. Jerome lived in a hole near a tree.

"Very pretty" Don said about the place—so many trees. And that's a nice farm next door. What do you do for fun?"

"I take walks and look for big kernels of corn," Jerome replied.

"Hmm, not that interesting," Don said.

At dinner, Don was disappointed. All that they had to eat was dried corn.

"I collected those last month," said Jerome. Now they're really tasty because when they dry out the flavor gets bigger."

Don said, "OK, but not as good as the food at my place. "You should visit me to find out what really great food we have. And it's not boring. Every day there are adventures."

That night, they looked at the stars. "So beautiful," Jerome said. "Yes," Don replied, "but so quiet. I'm bored. You should come to my place. Never boring. And we have streetlights so we can see those bright lights every night."

In another month, Jerome went to visit Don. The very first place that Don took Jerome to see was the kitchen of the house where he lived. "Just nibble in here," Don said, as they looked on a low shelf. There was a bag of sugar with a leak that Don had nibbled. Both mice ate away happily.

Then suddenly Don said, "Run. Run and hide." Jerome ran but didn't know why. Then he saw the reason. A big cat had come into the kitchen.

"Hide here," said Don, and they ducked into a hole in the wall.

After the cat went away, they came back out.

"Let's get a cookie," said Don, and he led Jerome to another shelf.

They were eating a cookie when someone came into the kitchen and screamed loudly.

"What's happening?" asked Jerome.

"Don't ask, just run!" said Don.

They both ran quickly past a mousetrap. "What is that," Jerome asked—he had never seen a mousetrap in the country.

"Don't go near it, it will hurt you," Don said. "I know how to escape them.

That night, Jerome could not sleep at all. He kept waking up every few minutes, worried about the dangers.

The next morning, Jerome made a decision. He told Don he was going to go back to the country.

"I like my home. I hope you are happy here, but I can't stay. Come back to see me sometime. It is not as exciting as the city, but you can have a long and happy life in the country."

Thinking Challenge: First, tell what the message of this story is.
Then write your own story that communicates that same message.

I Like Plants

Even when I was extremely young, I always loved plants. When we walked to school, I would observe the different plants and come up with names for each of them. I would even draw pictures of them. When my teacher asked us to draw a picture of anything we liked, I always ended up illustrating different plants. I even drew them when we weren't supposed to be drawing. My teacher would scold me about drawing all over my notebooks. But my mother would smile about it. "I think I see a scientist," she said.

When I got to high school, I registered for a course that was all about plants. Most students took the course in biology, but I decided to enroll in the course that focused on plants instead. Our class traveled to the park to identify various species. It was truly amazing to find that there were at least 27 different kinds of plants in our neighborhood park alone. In fact, there were about 12 different kinds of trees, also. Some were deciduous. We were there in the springtime, so they still had their leaves.

I discovered that weeds are not actually bad plants, but in reality are interlopers. They come from another environment, and somehow they get to the new environment. It could be that animals transport them. The animals might pick up the seeds on their fur and then carry them to the new habitat. After that, the seeds fall off and start to grow.

When I went to college, I knew that I wanted to study plants. I wanted a career in which I would be a plant scientist. I wanted to become a botanist. I took many courses in math, English, and history. While they were all good courses, it was the science courses I particularly enjoyed.

Now I teach at a college, and I teach students about plant life. My sister came to visit my class. She said, "I knew you would do this. You always spent your free time with the plant books when I wanted to play. It was puzzling to me. But I see it was your destiny. Look at how interested the students are."

I use real plants and diagrams to explain how plants grow. I explain how fertilizers can help plants grow but also may destroy the balance of nature. I teach about helpful insects. One of the most helpful insects for plants is the ladybug. Ladybugs are small insects that eat aphids, and they can protect plants by eating the aphids that would normally destroy the plants' leaves. There are about 5,000 kinds of ladybugs. In winter the ladybug hibernates, but in spring it comes back out and starts to protect the plants again. Several states have named the ladybug their state insect.

My students say they like my classes. They come back to take more classes from me. They say that I inspire them. Some of my students have become scientists, too.

I continue learning more about plants and the animals that depend on them. I enjoy being a teacher because I am constantly learning new things. I learn from my research on the Internet as well as going to the park and studying the plants in my community.

CCSSR1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

These are questions you can ask and answer about any story. Write your answers on another page.

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5. Main Idea: What do you think is the main idea of the story?

John's Bright Idea

CCSSR1: Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
Source: Public Domain, adapted by Center for Urban Education, may be used with citation.

This is an old story. It was written 100 years ago. So you will find it has a different style from stories people read and write today. For example, you'll read that the children sell popcorn for 5 cents a bag and are thrilled. Today, that's not enough money to buy much.

Mrs. Meredith was a most kind and thoughtful woman. She spent a great deal of time visiting the poor. She knew they had problems. She wanted to help them. She brought food. She brought medicine, too.

The family lived in a small community with some people who were poor and others who were rich. In the town, some people worked but others had no jobs, and families needed money to pay their bills. Some families were poor because the parents had lost jobs, and the economy was in decline. People tried to help each other meet these challenges.

One morning she told her children about a family she had visited the day before. There was a man sick in bed, his wife, who took care of him and could not go out to work, and their little boy. The little boy--his name was Bernard--had interested her very much.

"I wish you could see him," she said to her own children, John, Harry, and Clara, "he is such a help to his mother. He wants very much to earn some money, but I don't see what he can do."

After their mother had left the room, the children sat thinking about Bernard. "I wish we could help him to earn money," said Clara. "His family is suffering so much."

"So do I," said Harry. "We really should do something to assist them."

For some moments, John said nothing, but, suddenly, he sprang to his feet and cried, "I have a great idea! I have a solution that we can all help accomplish."

The other children also jumped up all attention. When John had an idea, it was sure to be a good one. "I tell you what we can do," said John. "You know that big box of corn Uncle John sent us for popping? Well, we can pop it, and put it into paper bags, and Bernard can take it around to the houses and sell it."

When Mrs. Meredith heard of John's idea, she, too, thought it a good one. Very soon, the children were busy popping the corn, while their mother went out to buy the paper bags. When she came back, she brought Bernard with her.

In a short time, he started out on his new business, and, much sooner than could be expected, returned with an empty basket. Tucked into one of his mittens were ten nickels. He had never earned so much money before in his life. When he found that it was all to be his, he was so delighted he could hardly speak, but his bright smiling face spoke for him. After he had run home to take the money to his mother, John said, "We have corn enough left to send Bernard out ever so many times. May we do it again?"

"Yes, said Mrs. Meredith, "you may send him every Saturday morning, if you will pop the corn for him yourselves. John, will you agree to take charge of the work?"

"Indeed I will," replied John, and he kept his word. For many weeks, every Saturday morning, no matter what opportunities there were to play, he saw that the corn was all popped, the paper bags filled, and arranged in the basket when Bernard arrived.

People began to watch for the "little pop-corn boy," and every week he had at least fifty cents to take home, and often significantly more, income that supported his family. All of this was because of the way John carried out his bright idea.

What is the main idea of this passage? Explain why you think that is the main idea.

California

by Michael Stahl

California is the third-largest state in America. Only Texas and Alaska have greater areas of landmass than California. However, the Golden State, as it is sometimes called, is the most populated. Over 38 million people call California home, which means about one out of every eight people in the United States of America lives there. Most Californians live in cities by the Pacific Ocean.

Perhaps the most famous region of the state of California is the southernmost section. San Diego is located there and is only about 20 miles north of Mexico. Sitting on the Pacific Ocean, San Diego has a population of 1.3 million people who get to enjoy the city's lovely climate. The nearby ocean keeps temperatures in San Diego rather steady. San Diego has a high temperature of at least 70 degrees for two-thirds of the days in a calendar year, and only 10 inches of rain on average fall there each year. San Diego's economy gets a big boost from tourism, with approximately 30 million people visiting there every year to enjoy the sunny days. Because of the favorable climate, surfing has become one of the most popular local sports.

However, Los Angeles, about a two-hour drive north, is undoubtedly a better-known city when compared to San Diego. L.A., as it is often abbreviated, is home to nearly four million people, making it the most highly populated city in California. Los Angeles only trails New York on the list of most populated cities in the entire country. Like San Diego, Los Angeles residents enjoy wonderful weather. There is a large surfing community in Los Angeles as well, but the city is best known as the center of the American film industry. Six hundred movies a year are made in Hollywood, which is located in L.A. Many historians believe the local climate is to thank for the existence of Hollywood, because it makes it easier to get more outdoor work done throughout the year. And since southern California is so

warm, many of America's finest athletes have come from that area too. They have been able to practice their sports year round in the warm southern California sun.

Another California city, San Francisco, is ranked among the most popular in the United States, but this one was settled farther north in a very different environment. San Francisco has a population of 800,000 within the city limits. Like San Diego and Los Angeles, San Francisco borders the Pacific Ocean. The city lies on a peninsula though, with the San Francisco bay on the opposite side of the ocean. The City by the Bay, as it is often labeled, is much cooler than those southern cities. One interesting fact about San Francisco is that the city features the lowest average summer temperatures of any major American city, even though other cities, like Seattle and Minneapolis, are much farther north. Very heavy fog rolls into parts of the city during the summer months because of wet winds from the Pacific Ocean mixing with warmer inland air. Fortunately, the winters are not very cold. San Francisco is also known for its rolling hills that are located all across the city. Streets that were built on these hills are very steep and tiring to walk on. That is why the many famous trolley cars jet up and down the hilly streets, making transportation a little easier for San Francisco's citizens.

Name: _____ Date: _____

1. Which statement most accurately describes the size of California?

A. California is the largest state in America.

B. California is the third-largest state in America.

C. California is one of the smallest states in America.

D. California is a state of average size in America.

2. The author contrasts San Francisco with San Diego and Los Angeles. How is San Francisco different from San Diego and Los Angeles?

A. The temperatures in San Francisco are much cooler.

B. The population of San Francisco is much higher.

C. Surfing is more popular in San Francisco.

D. The winters in San Francisco are warmer.

3. The climate of a city can influence its culture. What sentence from the text best supports this conclusion?

A. One interesting fact about San Francisco is that the city features the lowest average summer temperatures of any major American city.

B. There is a large surfing community in Los Angeles as well, but the city is best known as the center of the American film industry.

C. Over 38 million people call California home, which means about one out of every eight people in the United States of America lives there.

D. San Diego's economy gets a big boost from tourism, with approximately 30 million people visiting there every year to enjoy the sunny days. Because of the favorable climate, surfing has become one of the most popular local sports.

4. San Francisco's climate is colder and foggier than that of Los Angeles and San Diego. What is most likely an effect this climate has on San Francisco?

A. This climate makes San Francisco as popular a place to surf as San Diego or Los Angeles.

B. This climate means San Francisco has less surfing and moviemaking than southern cities like San Diego and Los Angeles.

C. This climate allows San Francisco to offer its people many outdoor activities that depend on the sun and warm weather.

D. This climate means San Francisco is full of people who stay inside most of the time and industries that are not weather-dependent.

5. What is this text mostly about?

A. how Los Angeles and San Diego are similar and different

B. why San Francisco is different from Los Angeles and San Diego

C. three cities in California

D. why the climates in California differ from region to region

6. Read the following sentence from the story: "That is why the many famous trolley cars **jet up and down** the hilly streets, making transportation a little easier for San Francisco's citizens."

The author uses the phrase "**jet up and down**" to describe what?

A. the way the trolley cars go at a pace that is frustrating for San Francisco's citizens

B. the way the trolley cars travel slowly

C. the way the trolley cars move at a regular pace

D. the way the trolley cars move quickly up and down the streets

7. Choose the answer that best completes the sentence below.

There is a large surfing community in Los Angeles, _____ the city is best known as the home of Hollywood.

A. because

B. but

C. then

D. on the other hand

8. List two facts the author provides about each city he describes.

_____

_____

_____

9. According to the text, how is San Francisco different from Los Angeles and San Diego? Use information from the text to support your answer.

_____

_____

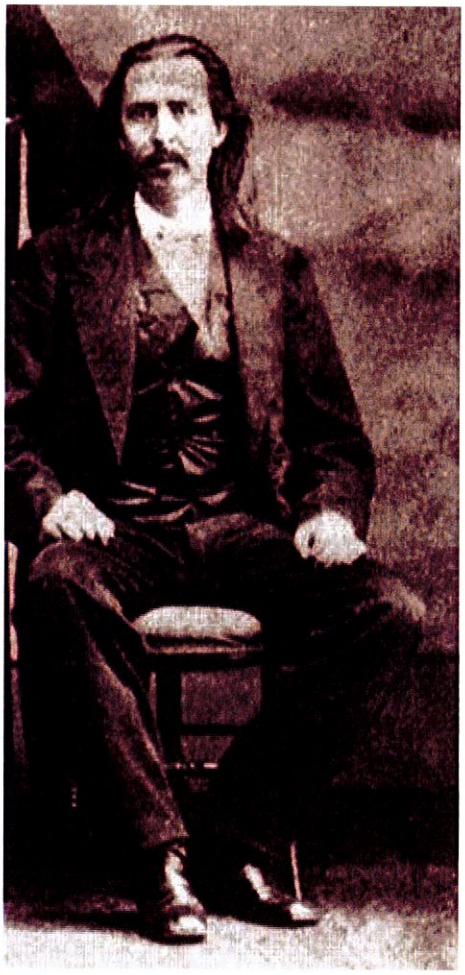
_____

10. The author compares and contrasts the cities he describes in the text.

Use information from the text to support this statement.

Cherokee in the United States

by ReadWorks



William Penn Adair, Cherokee delegate to U.S. Congress, 1866

A very long time ago, before the United States even existed, the land was already home to a wide variety of different American Indian tribes. You may have also heard people belonging to these tribes called "Indian" and "Native American." While some people may think of American Indians as one group of people who are all similar to one other, there are actually big differences between the American Indian ethnic groups and the tribes formed within them. Each of the different ethnic groups has a unique culture and language, and each tribe has its own system of government. Each tribe also has a unique history of interaction with early European settlers and the United States.

One example of an American Indian ethnic group is the Cherokee. Within this group, the Cherokee people formed tribes, or communities whose members shared a language, customs, and beliefs. Currently, there are three "federally recognized" Cherokee tribes in the United States, which means they get special programs and services from the government, and also have certain legal rights. In addition to these three recognized tribes, there are more than 200 other groups who identify themselves as Cherokee tribes.

The Cherokee originally lived in what we now know as the southeastern United States. This includes modern-day Georgia, North Carolina, South Carolina, and Tennessee. They lived by farming, hunting, and gathering on the land. In the 1700s, they first started to interact with the Europeans. The Cherokee traded deerskins with the Europeans, and the two groups generally had a good relationship with each other. However, as more European settlers began to move onto land the Cherokee needed for hunting or gathering, the Europeans and the Cherokee came into conflict. This led to many battles, and the Cherokee lost a lot of land to the Europeans. After the American Revolution, the Cherokee lost even more of their land as the Americans began to build new settlements in Cherokee territory.

Over the next few decades, the Cherokee people started to change. As they spent more time with the Americans, they started to adopt some parts of American culture and technology. For example, Cherokee tribes used to grow their food on communal farms. This means that the entire tribe shared the same land, farming it together and sharing the crops among themselves. The Americans encouraged them to switch to growing their food on individual farmsteads. This practice is similar to what we think of as farming today. Each farmer owns a piece of land, and grows his or her own crops on it. They also raised pigs and cattle on the land instead of hunting deer. The new United States government also gave the Cherokee spinning wheels and taught them how to spin cotton. In the 1800s, the Cherokee even began to adopt some of the structures of the United States government for their own society. They even had their own Constitution!

However, as the United States grew, the government wanted more land for new settlers. This led to the government and army pushing Cherokee off their land. At first, some of the Cherokee voluntarily relocated, but a lot of them were forced to move even though they didn't want to. In the 1830s, in an infamous event known as the Trail of Tears, the United States Army forced the Cherokee to march to Oklahoma. More than 4,000 Cherokee died during this march.

Today, most Cherokee live in Oklahoma, North Carolina, or on the West Coast. In the decades following the Trail of Tears and forced removal of the Cherokee, the United States government has worked hard to improve its relationship with the Cherokee and other American Indian groups. The government passed laws to let some tribes maintain their own governments and govern themselves legally within the United States. The Cherokee Nation is the largest federally recognized Cherokee tribe, and it has more than 300,000 members today.

Name: _____ Date: _____

1. When did the Cherokee people first start to interact with Europeans?

A. the 1500s

B. the 1600s

C. the 1700s

D. the 1800s

2. What does this passage describe?

A. This passage describes the historical background of the Cherokee in the United States.

B. This passage describes the different tribes of American Indians, including the Cherokee.

C. This passage describes the different places that the Cherokee have lived.

D. This passage describes how the Cherokee farm their land.

3. The Cherokee were not always treated fairly by the United States government. What evidence from the passage supports this statement?

A. "The Americans encouraged [the Cherokee] to switch to growing their food on individual farmsteads."

B. "[A]s the United States grew, the government . . . and army push[ed] the Cherokee off their land."

C. "The Cherokee Nation is the largest federally recognized Cherokee tribe, and it has more than 300,000 members today."

D. "In the 1800s, the Cherokee even began to adopt some of the structures of the United States government for their own society."

4. What has been the main reason for conflict between the Cherokee and the United States?

A. The United States wanted the land on which the Cherokee lived.

B. The Cherokee live in tribes, while most people in the United States do not.

C. The Cherokee adopted some parts of American culture and technology.

D. Americans farmed differently than the Cherokee.

5. What is the main idea of this text?

A. Since the Trail of Tears, the United States has worked hard to improve its relationship with the Cherokee.

B. After interacting with Americans, Cherokee farmers began raising their own crops, pigs, and cattle.

C. The governments of Cherokee tribes are very different from the government of the United States of America.

D. The Cherokee's relationship with the United States government has changed with their interactions.

6. Read these sentences from the text.

[The Cherokee] lived by farming, hunting, and gathering on the land. In the 1700s, they first started to interact with the Europeans. The Cherokee traded deerskins with the Europeans, and the two groups generally had a good relationship with each other.

Based on these sentences, what does the word "interact" mean?

A. to compete

B. to dislike

C. to come into contact

D. to teach skills

7. Choose the answer that best completes the sentence.

_____ , the Cherokee had a good relationship with early European settlers.

A. Initially

B. Instead

C. Finally

D. Obviously

8. What was the Trail of Tears?

9. How has the United States tried to improve its relationship with the Cherokee?

10. How has the relationship between the Cherokee and the United States changed over time? Support your answer with evidence from the text.

First Ladies

Three countries. Three new leaders. Three women.

Chris Hondros/Getty Images

Johnson-Sirleaf vows to unite Liberia and create jobs.

Chile, Liberia, and Germany don't seem to have much in common. The three countries lie on different continents. They do not have a shared language, currency, culture, or history.

But on closer examination, those different nations are more similar than they appear. All three nations have elected women leaders. Michelle Bachelet of Chile, Ellen Johnson-Sirleaf of Liberia, and Angela Merkel of Germany join a small but growing group of female heads of state.

Here is a look into the lives of these three powerful women and the challenges currently facing their countries.

Michelle Bachelet - Chile

When Michelle Bachelet was 23 years old, she and her mother were jailed and beaten. They had opposed a 1973 coup, or government overthrow, that brought Augusto Pinochet Ugarte to power. Pinochet was a brutal dictator who terrorized those who disagreed with him. He jailed more than 27,000 Chileans and executed more than 3,000.

Bachelet and her mother were released and exiled to Australia and Germany. In 1979, Bachelet returned to Chile and graduated from medical school. After democracy was restored in Chile in 1990, she entered public service. Bachelet served as Minister of Health and as Defense Minister. She was praised for helping to heal lingering distrust between Chilean citizens and the military. On January 15, 2006 the 54-year-old was elected President. Her term ended in March of 2010.

As Chile's first female head of state, Bachelet's priority was to bridge the gap between the rich and the poor. Chile is a wealthy nation, but the richest 20 percent of its population controls 61 percent of the country's wealth, according to the World Bank.

"Chile needs to [create] more equal opportunities so that everyone can benefit from what the country has to offer," Bachelet told reporters after her election.

Ellen Johnson-Sirleaf - Liberia

Ellen Johnson-Sirleaf is known as "Iron Lady" and "Ma Ellen." Both sides of her personality will help her in the daunting task she faces: reuniting and rebuilding Liberia following 14 years of war.

Although the bloody civil war ended a few years ago, scars still mark the African nation. Fighting left more than 200,000 people dead. Millions more were forced to flee their homes. Liberia still has no regular electricity or running water. The nation's unemployment rate is 80 percent.

Johnson-Sirleaf, a Harvard-educated economist and grandmother, has vowed to make a "fundamental break" with her country's past. "We [must] take bold and decisive steps to address the problems that for decades have stunted our progress," Johnson-Sirleaf said in her inaugural address on January 16, 2006.

Johnson-Sirleaf is Africa's first elected female head of state, but she is not new to politics. She served as Liberia's Finance Minister until 1980 and made an unsuccessful run for the presidency in 1997.

"I am excited by the potential of what I represent: the aspirations and expectations of women in Liberia, African women, and women all over the world," Johnson-Sirleaf says.

Angela Merkel - Germany

Angela Merkel is not only the first woman to serve as the Chancellor of Germany but also the first Chancellor, male or female, to have grown up in East Germany.

After World War II (1939-1945), the United States, France, and Britain divided Germany into two parts-East Germany and West Germany. As West Germany prospered as a democracy, communist East Germany remained poor. Under communism, the country had few jobs. East and West Germany were reunited in 1989.

Experts say Merkel's humble upbringing as a minister's daughter will help her understand Germany's economic problems. Back when she was elected, the European country's economy hadn't grown for more than five years, and 12.6 percent of the population was unemployed in March 2005. That unemployment rate was the highest Germany had seen since the 1930s.

When Merkel was sworn in as Chancellor on November 22, 2005, she promised to reduce unemployment. "Our aim is to stop this downward trend and reverse it," Merkel told reporters. "We want to give people hope of having jobs." The country's unemployment has since fallen to 5.6 percent.

Name: _____ Date: _____

1. Which three countries have chosen women to lead them?

A. Italy, France, and Liberia

B. Canada, Liberia, and Germany

C. Chile, Liberia, and Germany

D. Cuba, Liberia, and Germany

2. Read these three sentences from the passage, and answer the question below:

"Chile, Liberia, and Germany don't seem to have much in common. The three countries lie on different continents. They do not have a shared language, currency, culture, or history."

Which of the following describes the relationship of these sentences?

A. The sentences present three items in sequence.

B. One sentence gives a cause, and the others give effects.

C. The sentences describe problems and solutions.

D. The sentences compare three countries.

3. What might have best prepared the three women to lead their countries?

A. meetings with other leaders

B. trips to other countries

C. their families

D. their past experiences

4. Read this sentence from the passage:

"She was praised for helping to heal lingering distrust between Chilean citizens and the military."

Based on the text, the word lingering means

A. lasting
B. rising
C. increasing
D. growing

5. Which statement supports the main idea of the passage?

A. Three women have become leaders of their countries.
B. Three countries elected women leaders to solve major economic and social problems.
C. Chile and Liberia have serious social problems that need to be resolved.
D. Three countries have to solve major economic and social problems.

6. In which country do only a small percentage of people control most of the wealth?

7. What might help each of the leaders solve her country's economic problems? Cite information in the passage to support your answer.

8. The question below is an incomplete sentence. Choose the word that best completes the sentence.

The bloody civil war ended a few years ago, _____ scars still mark the African nation.

A. mostly

B. next

C. after

D. but

Name: _____ **Date:** _____

1. The priority of both Ellen Johnson-Sirleaf and Angela Merkel is:

A. crime.

B. healthcare.

C. unemployment.

D. education.

2. Based on the passage, what do Liberia and Germany have in common?

A. Both countries are located on the continent of Africa.

B. Both countries have been negatively affected by war.

C. People in both countries speak the same language.

D. Neither country has electricity or running water.

3. The author wrote that Bachelet has improved the "lingering distrust" between the citizens of Chile and the military." This means

A. the military is having a hard time controlling the citizens of Chile.

B. the citizens of Chile do not want to join the military.

C. the citizens of Chile still do not fully trust the military.

D. the citizens of Chile trusted the military too much.

4. The three countries, Liberia, Germany and Chile, are all

A. wealthy nations.

B. currently at war with one another.

C. on different continents.

D. experiencing low unemployment rates.

5. Do you think women lead their countries differently from the way men do? Why or why not?

7h Grade Science Lesson Plan/Worksheet for April 5-9 (Biology)

Directions-Read and Understand the Lesson and the Vocabulary.

Finish the homework by answering the questions at the end of the page.

Monday- Life history strategies

Tuesday- Population size, density, & dispersal

Wednesday- Life tables, survivorship, & age-sex structure

Thursday- Thursday-Population Ecology-Test

Friday- How to protect yourself from Coronavirus disease

Monday - Read and Understand the Lesson and the Vocabulary.

Finish the homework by answering the questions at the end of the page.

Life history strategies

How organisms allocate energy to maximize the number of offspring they leave behind.

Summary

- The **life history** of a species is the pattern of survival and reproduction events typical for a member of the species (essentially, its lifecycle).
- Life history patterns evolve by natural selection, and they represent an "optimization" of tradeoffs between growth, survival, and reproduction.
- One tradeoff is between number of offspring produced and the amount of energy (both physical resources and parental care) put into each offspring.
- Timing of first reproduction is another tradeoff. Early reproduction lowers the chance of dying without offspring, but later reproduction may allow organisms to have more or healthier offspring or to provide better care.
- Members of some species reproduce only once (**semelparity**), while members of other species can reproduce multiple times (**iteroparity**).

What is a "life history"?

What does *your* life history look like? In the world of ecology, that question doesn't refer to the many challenges and successes you've experienced, or to the friendships you've made along the way. (Not that those aren't good too!)

Instead, when we're talking about life history in ecology, we're thinking about basic demographic features of a population or species – the kind of things that would appear in a life table. That includes when organisms first reproduce, how many offspring they

have in each round of reproduction, and how many times reproduction occurs. For humans, life history involves a late start to reproduction, few offspring, and the ability to reproduce multiple times.

We can define the **life history** of a species as its lifecycle, and in particular, the lifecycle features related to survival and reproduction^11start superscript, 1, end superscript. Life history is shaped by natural selection and reflects how members of a species distribute their limited resources among growth, survival, and the production of offspring.

Life history strategies and natural selection

All living things need energy and nutrients to grow, maintain their bodies, and reproduce. In nature, these resources are in limited supply, and there is often competition for access to them (e.g., to sunlight and minerals for plants or food sources for animals). Thus, each organism will have non-infinite resources to divide among activities like growth, body maintenance, and reproduction.

What does it mean for an organism to allocate its limited resources "well" in this context? From an evolutionary standpoint, it means that the resources are distributed among the potential activities (growth, maintenance, reproduction) in a way that maximizes **fitness**, or the number of offspring the organism leaves in the next generation. Organisms with inherited traits that cause them to distribute their resources in a more effective way will tend to leave more offspring than organisms lacking these traits, causing the traits to increase in the population over generations by natural selection^{2,3}2,3start superscript, 2, comma, 3, end superscript.

Over very long periods of time, this process results in species with **life history strategies**, or collections of life history traits (number of offspring, timing of reproduction, amount of parental care, etc.), that are well-adapted for their role and

environment. The optimal life history strategy may be different for each species, depending on its traits, environment, and other constraints^{2}2squared.

In this article, we'll examine some tradeoffs in life history strategies and see examples of plants and animals that use strategies of different types.

Parental care and fecundity

One major tradeoff in life history strategies is between number of offspring and a parent's investment in the individual offspring. Basically, this is a "quantity versus quality" question: an organism can have many offspring that each represent a relatively small energy investment, or few offspring that each represent a relatively large energy investment.

To put this more formally, we can say that **fecundity** tends to be inversely related to the amount of energy invested per offspring. Fecundity is an organism's reproductive capacity (the number of offspring it's capable of producing). The higher the fecundity of an organism, the less energy it's likely to invest in each offspring, both in terms of direct resources – such as fuel reserves placed in an egg or seed – and in terms of parental care.

- Organisms that produce large numbers of offspring tend to make a relatively small energy investment in each, and don't usually provide much parental care. The offspring are "on their own," and the idea is that enough are produced that *some* will survive (even if the odds for any one are low).
- Organisms that make few offspring usually make a large energy investment in each offspring and often provide lots of parental care. These organisms are effectively "putting their eggs in one basket" (literally, in some cases!) and are heavily invested in the survival of each offspring.

As for so many cases in biology, these are general trends and not universal rules. The main point is just that when organisms have many offspring, they can't invest as much energy in any single offspring. When they have fewer, they can (and must) invest more energy to ensure those offspring's survival.

Example: Many offspring, low investment/parental care

A typical sea snail (whelk) produces hundreds of eggs at a pop, and these eggs hatch to yield baby snails that are pretty self-sufficient from the get-go. In fact, the baby snails in the first 10\%10%10, percent of eggs that hatch will enthusiastically eat their slower-hatching siblings for breakfast^44start superscript, 4, end superscript!

Image modified from "Egg cases - Common whelk," by Sarah Smith, CC BY-SA 2.0.

Cannibalism aside, this example is a good illustration of one common type of parental investment strategy. Sea snails and many other marine invertebrates provide little (if any) care to their offspring. Instead, they use most of their energy budget to make *lots* of offspring, each of which is relatively small. The sea snail isn't even that

impressive when it comes to numbers—a female sea urchin might release 100,100,100, comma000,000,000, comma000000000 eggs in a single spawning^55start superscript, 5, end superscript!

In species with this type of strategy, offspring are often self-sufficient at an early age. Still, since not much energy is invested in each offspring, they tend to be small and come into the world with low energy reserves. This makes the offspring vulnerable to predation, so many or most will not survive—instead, it's their sheer numbers that ensure the survival of the population.

Example: Few offspring, high investment/parental care

To see a strategy at the opposite end of the spectrum, let's consider the giant panda. Panda females typically have just one cub each time they reproduce, and the young cub is far from self-sufficient^66start superscript, 6, end superscript. That pink thing in the picture below isn't a mouse or a kitten...it's actually a newborn panda!

Animal species like the panda, which have few offspring during each reproductive event, often give extensive parental care. They may also produce larger, more energetically "expensive" offspring. The newborn panda above may look tiny, but compared to a hatching sea snail, it's massive! Species with this type of high-investment strategy use much of their energy budget to care for their offspring, sometimes at the expense of their own health.

This type of strategy is common in mammals, including humans and kangaroos as well as pandas. The babies of these species are relatively helpless at birth and need to develop quite a bit before they

become self-sufficient.

Fecundity and investment tradeoffs in plants

The same broad patterns seen in animals also apply to plants. Of course, plants aren't going to provide parental care in the same way that animals do. However, they can still

produce either large numbers of energetically "cheap" seeds or small numbers of energetically "expensive" seeds.

For example, plants with low fecundity, such as coconuts and chestnuts, produce small numbers of energy-rich seeds, each of which has a good chance of germinating into a new organism. Plants with high fecundity, such as orchids, take the opposite approach: they usually make many small, energy-poor seeds, each of which has a relatively low chance of surviving.

Timing of first reproduction (early vs. late)

When a species starts reproducing is another important part of its life history—and another place where we see trade-offs and lots of variation among species. Some types of plants and animals start reproducing early, while others delay much longer. What are the pros and cons of these strategies?

Organisms that reproduce *early* have less risk of leaving no offspring at all, but this is may be at the expense of their growth or health. For example, small fish like guppies use their energy to reproduce early in life, but since they throw all their energy to reproduction, they don't reach the size that would give them defense against predators. (An intimidating guppy is kind of hard to picture!)

Organisms that reproduce at a *later* age often have greater fecundity or are better able to provide parental care. On the flip side, they run a greater risk of not surviving to reproductive age. For example, larger fish, like the bluegill or shark, use their energy to grow to a size that gives them more protection. As a consequence, they delay reproduction, so there's more chance that they will die before reproducing (or before they've reproduced to their maximum).

In general, age at first reproduction is linked to the lifespan of a species^77start superscript, 7, end superscript. Short-lived species often start reproducing early, while

long-lived species are more likely to delay reproduction. This is a good reminder that a life history strategy is an integrated "solution" to the problem of leaving as many offspring as possible, and that any one part (e.g., age of first reproduction) only makes sense in light of others (e.g., lifespan).

Single vs. multiple reproductive events

Another important characteristic of life history relates to how many times an organism reproduces over its lifetime. For some species, reproduction is a one-time, all-out event, and the organism doesn't survive much beyond that one event. In other species, opportunities for reproduction come around multiple times, or even many times, throughout the organism's lifetime.

To apply a little ecology vocab, we can split species into two groups:

- Those that can reproduce only once (semelparity)
- Those that can reproduce multiple times over their lifetime (iteroparity)

Semelparity

In **semelparity**, a member of a species reproduces only once during its lifetime and then dies. Species with this pattern use up most of their resource budget in a single reproductive event, sacrificing their health to the point that they do not survive.

Examples of species that display semelparity are bamboo, which flowers once and then dies, and the Chinook salmon, which uses most of its energy reserves to migrate from the ocean to its freshwater nesting area, where it reproduces and then dies.
[Why does the salmon die once it reproduces?]

Image credit: "Life histories and natural selection: Figure 1," by OpenStax College, Biology, CC BY 4.0. Modification of work by Roger Tabor, USFWS.

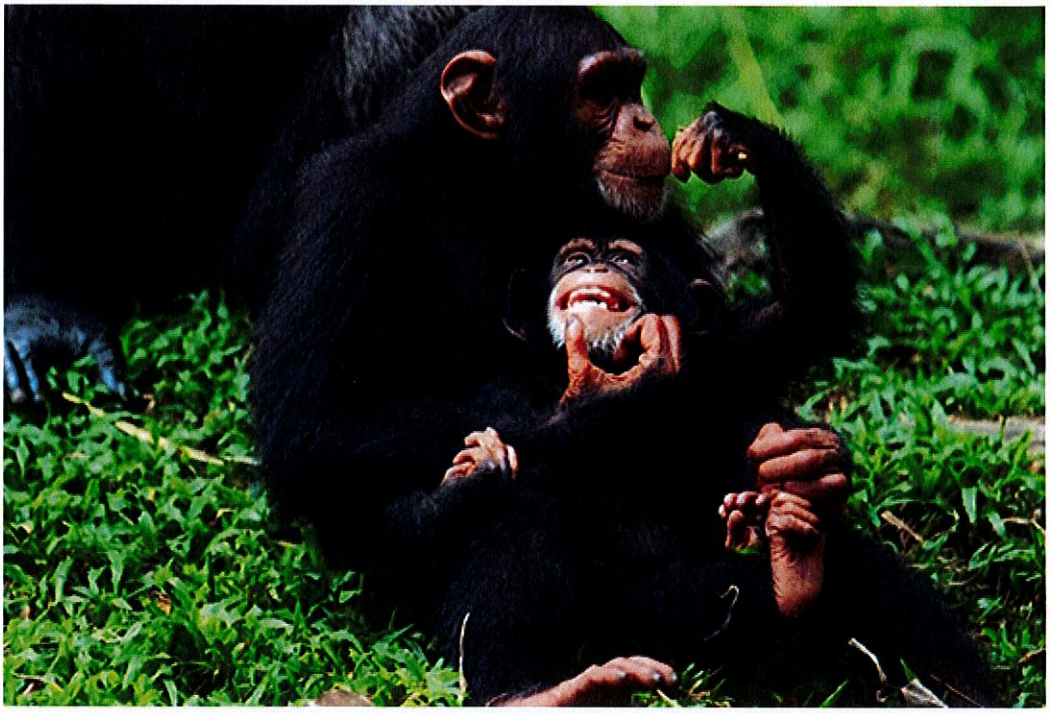
Iteroparity

In **iteroparity**, individuals of a species reproduce repeatedly during their lives. Iteroparity can take different forms, depending on the reproductive cycles of the organisms involved. Species that display iteroparity don't put all of their resources into a single reproductive event, as there's a fitness benefit (an opportunity to have more offspring) in surviving to reproduce more times.

Some animals are able to mate only once per year, but can survive through multiple mating seasons. The pronghorn antelope is an example of an animal that has a seasonal estrus cycle ("heat"). Estrus is a hormonally induced physiological condition that prepares the body for successful mating. Females of species with estrus cycles mate only during the estrus phase of the cycle.

Image credit: "Life histories and natural selection: Figure 1," by OpenStax College, Biology, CC BY 4.0. Modification of work by Mark Gocke, USDA.

A different pattern is observed in primates, including humans and chimpanzees, which may attempt reproduction at any time during their reproductive years. However, the menstrual cycles of the females make pregnancy likely only a few days per month during ovulation.



Science Homework Monday
Name; _____ Date_____

1.How organisms allocate energy to maximize the number of offspring they leave behind?

2.What is Life History?

3. **What are patterns of distribution and density.**

4, What exactly the difference between population density and size?

5. What is **semelparity?**

6. What is **iteroparity?**

Tuesday -Read and Understand the Lesson and the Vocabulary.

Finish the homework by answering the questions at the end of the page.

Population size, density, & dispersal

What an ecological population is. How scientists define and measure population size, density, and distribution in space.

Key points

- A **population** consists of all the organisms of a given species that live in a particular area.
- The statistical study of populations and how they change over time is called **demography**.
- Two important measures of a population are **population size**, the number of individuals, and **population density**, the number of individuals per unit area or volume.
- Ecologists estimate the size and density of populations using quadrats and the mark-recapture method.

- The organisms in a population may be distributed in a **uniform**, **random**, or **clumped** pattern. Uniform means that the population is evenly spaced, random indicates random spacing, and clumped means that the population is distributed in clusters.

What is a population?

In everyday life, we often think about population as the number of people who live in a particular place—New York City has a population of 8.6 million.^11start superscript, 1, end superscript Or Monowi, Nebraska has a population of *one*. Just think—you could double the population of Monowi if you felt like moving there!

In ecology, a *population* consists of all the organisms of a particular species living in a given area. For instance, we could say that a population of humans lives in New York City, and that another population of humans lives in Gross. We can describe these populations by their size—what we often mean by population when we're talking about towns and cities—as well as by their density—how many people per unit area—and distribution—how clumped or spread out the people are.

Demography: describing populations and how they change

In many cases, ecologists aren't studying people in towns and cities. Instead, they're studying various kinds of plant, animal, fungal, and even bacterial populations. The statistical study of any population, human or otherwise, is known as *demography*.

Why is demography important? Populations can change in their numbers and structure—for example age and sex distribution—for various reasons. These changes can affect how the population interacts with its physical environment and with other species.

By tracking populations over time, ecologists can see how these populations have changed and may be able to predict how they're likely to change in the future. Monitoring the size and structure of populations can also help ecologists manage populations—for example, by showing whether conservation efforts are helping an endangered species increase in numbers.

In this article, we'll begin our journey through demographics by looking at the concepts of population size, density, and distribution. We'll also explore some methods ecologists use to determine these values for populations in nature.

Population size and density

To study the demographics of a population, we'll want to start off with a few baseline measures. One is simply the number of individuals in the population, or *population size*—N*N*N. Another is the *population density*, the number of individuals per area or volume of habitat.

Size and density are both important in describing the current status of the population and, potentially, for making predictions about how it could change in the future:

- Larger populations may be more stable than smaller populations because they're likely to have greater genetic variability and thus more potential to adapt to changes in the environment through natural selection.
- A member of a low-density population—where organisms are sparsely spread out—might have more trouble finding a mate to reproduce with than an individual in a high-density population.

Measuring population size

To find the size of a population, can't we just count all the organisms in it? Ideally, yes! But in many real-life cases, this isn't possible. For instance, would you want to try and count every single grass plant in your lawn? Or every salmon in, say, Lake Ontario, which is 393 cubic miles in volume?^11start superscript, 1, end superscript Counting all the organisms in a population may be too expensive in terms of time and money, or it may simply not be possible.

For these reasons, scientists often estimate a population's size by taking one or more samples from the population and using these samples to make inferences about the population as a whole. A variety of methods can be used to sample populations to determine their size and density. Here, we'll look at two of the most important: the **quadrat** and **mark-recapture** methods.

Quadrat method

For immobile organisms such as plants—or for very small and slow-moving organisms—plots called *quadrats* may be used to determine population size and density. Each quadrat marks off an area of the same size—typically, a square area—within the habitat. A quadrat can be made by staking out an area with sticks and string or by using a wood, plastic, or metal square placed on the ground, as shown in the picture below.

Image credit: modified from *Population demography: Figure 2* by OpenStax College, Biology, CC BY 4.0; original image credit: NPS Sonoran Desert Network

After setting up quadrats, researchers count the number of individuals within the boundaries of each one. Multiple quadrat samples are performed throughout the habitat at several random locations, which ensures that the numbers recorded are representative for the habitat overall. In the end, the data can be used to estimate the population size and population density within the entire habitat.

Mark-recapture method

For organisms that move around, such as mammals, birds, or fish, a technique called the *mark-recapture method* is often used to determine population size. This method involves capturing a sample of animals and marking them in some way—for instance, using tags, bands, paint, or other body markings, as shown below. Then, the marked

animals are released back into the environment and allowed to mix with the rest of the population.

Image credit: *Population demography: Figure 3* by OpenStax College, Biology, CC BY 4.0; originals: left, modification of work by Neal Herbert, NPS; middle, modification of work by Pacific Southwest Region USFWS; right, modification of work by Ingrid Taylar

Later, a new sample is collected. This new sample will include some individuals that are marked—recaptures—and some individuals that are unmarked. Using the ratio of marked to unmarked individuals, scientists can estimate how many individuals are in the total population.

Example: using the mark-recapture method

Let's say we want to find the size of a deer population. Suppose that we capture 80 deer, tag them, and release them back into the forest. After some time has passed—allowing the marked deer to thoroughly mix with the rest of the population—we come back and capture another 100 deer. Out of these deer, we find that 20 are already marked.

If 20 out of 100 deer are marked, this would suggest that marked deer—which we know are 80 in number—make up 20% of the population. Using this information, we can formulate the following relationship:

\dfrac{\text{number marked first catch } (M)}{\text{total population } (N)}total population (*N*)number marked first catch (*M*)start fraction, start text, n, u, m, b, e, r, space, m, a, r, k, e, d, space, f, i, r, s, t, space, c, a, t, c, h, space, end text, left

parenthesis, M, right parenthesis, divided by, start text, t, o, t, a, l, space, p, o, p, u, l, a, t, i, o, n, space, end text, left parenthesis, N, right parenthesis, end fraction==equals\dfrac{\text{number marked second catch } (x)}{\text{total number of second catch } (n)}total number of second catch (n)number marked second catch (x)start fraction, start text, n, u, m, b, e, r, space, m, a, r, k, e, d, space, s, e, c, o, n, d, space, c, a, t, c, h, space, end text, left parenthesis, x, right parenthesis, divided by, start text, t, o, t, a, l, space, n, u, m, b, e, r, space, o, f, space, s, e, c, o, n, d, space, c, a, t, c, h, space, end text, left parenthesis, n, right parenthesis, end fraction

\quad\quad\quad \:\:\quad\quad\quad\quad\quad\quad\quad\quad\quad \dfrac{M}{N}NMstart fraction, M, divided by, N, end fraction ==equals \dfrac{x}{n}nxstart fraction, x, divided by, n, end fraction

Next, we rearrange the equation:

\quad\quad\quad \quad\quad\quad\quad\quad\quad\quad\quad\quad\quad\:\:\:
NNN ==equals \dfrac{nM}{x}xnMstart fraction, n, M, divided by, x, end fraction

And finally, we plug in the values from the deer example:

NNN ==equals \dfrac{(100 \text{ total second catch})(80\text{ marked first catch})}{(20\text{ marked second
catch})}(20 marked second catch)(100 total second catch)(80 marked first catch)start fraction, left parenthesis, 100, start text, space, t, o, t, a, l, space, s, e, c, o, n, d, space, c, a, t, c, h, end text, right parenthesis, left parenthesis, 80, start text, space, m, a, r, k, e, d, space, f, i, r, s, t, space, c, a, t, c, h, end text, right parenthesis, divided by, left parenthesis, 20, start text, space, m, a, r, k, e, d, space, s, e, c, o, n, d, space, c, a, t, c, h, end text, right parenthesis, end fraction ==equals 400 \text{ deer}400 deer400, start text, space, d, e, e, r, end text

This approach isn't always perfect. Some animals from the first catch may learn to avoid capture in the second round, inflating population estimates. Alternatively, the same

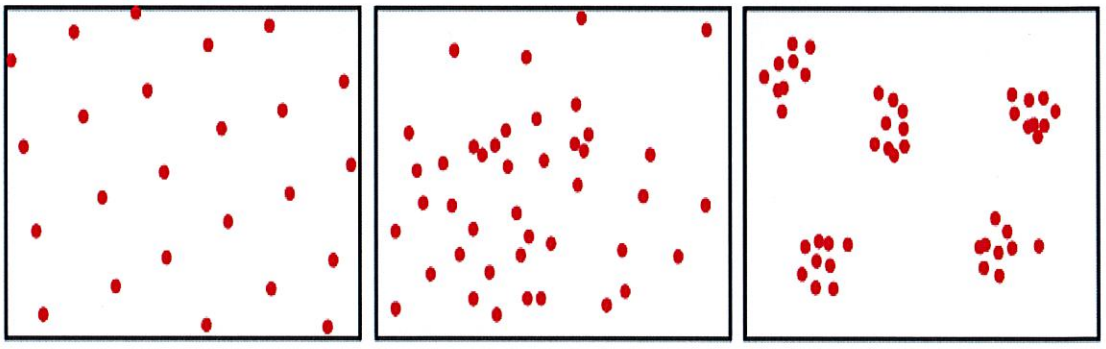
animals may preferentially be retrapped—especially if a food reward is offered—resulting in an underestimate of population size. Also, some species may be harmed by the marking technique, reducing their survival. The approach also assumes that animals don't die, get born, leave, or enter the population during the period of the study.

Alternative approaches to determine population size include electronic tracking of animals tagged with radio transmitters and use of data from commercial fishing and trapping operations.

Species distribution

Often, in addition to knowing the number and density of individuals in an area, ecologists will also want to know their distribution. Species **dispersion patterns**—or **distribution patterns**—refer to how the individuals in a population are distributed in space at a given time.

The individual organisms that make up a population can be more or less equally spaced, dispersed randomly with no predictable pattern, or clustered in groups. These are known as uniform, random, and clumped dispersion patterns, respectively.



- *Uniform dispersion.* In uniform dispersion, individuals of a population are spaced more or less evenly. One example of uniform dispersion comes from plants that secrete

toxins to inhibit growth of nearby individuals—a phenomenon called allelopathy. We can also find uniform dispersion in animal species where individuals stake out and defend territories.

- *Random dispersion.* In random dispersion, individuals are distributed randomly, without a predictable pattern. An example of random dispersion comes from dandelions and other plants that have wind-dispersed seeds. The seeds spread widely and sprout where they happen to fall, as long as the environment is favorable—has enough soil, water, nutrients, and light.
- *Clumped dispersion.* In a clumped dispersion, individuals are clustered in groups. A clumped dispersion may be seen in plants that drop their seeds straight to the ground—such as oak trees—or animals that live in groups—schools of fish or herds of elephants. Clumped dispersions also happen in habitats that are patchy, with only some patches suitable to live in.

  As you can see from these examples, dispersion of individuals in a population provides more information about how they interact with each other—and with their environment—than a simple density measurement.

Summary

In ecology, a *population* consists of all the organisms of a given species that live in a particular area. The statistical study of populations and how they change over time is called *demography*.

Two important measures of a population are *population size*, the number of individuals, and *population density*, the number of individuals per unit area or volume. Ecologists often estimate the size and density of populations using *quadrats* and the *mark-recapture method*. A population can also be described in terms of the distribution, or dispersion, of the individuals that make it up. Individuals may be distributed in

a *uniform*, *random* pattern. or *clumped* pattern. Uniform means that the population is evenly spaced, random indicates random spacing, and clumped means that the population is distributed in clusters.

Tuesday Science Homework-**Word Definition**

Name; _____ Date_____

1.Population-

2.Demography

3.Population size

4. Population density

5.Ecologyst

6. Uniform

7. Random

8. Clumped

Wednesday- Read and Understand the Lesson and the Vocabulary.

Finish the homework by answering the questions at the end of the page.

Life tables, survivorship, & age-sex structure

Tools ecologists use to describe the present state of a population and predict its future growth.

Key points

- To predict if a population will grow or shrink, ecologists need to know birth and death rates for organisms at different ages as well as the current age and sex makeup of the population.
- **Life tables** summarize birth and death rates for organisms at different stages of their lives.
- **Survivorship curves** are graphs that show what fraction of a population survives from one age to the next.
- An **age-sex pyramid** is a "snapshot" of a population in time showing how its members are distributed among age and sex categories.

Introduction

Governments around the world keep records of human birth and death rates—not just for the overall population of a country but also for specific groups within it, broken down by age and sex. Often, this data is arranged in summary tables called *life tables*. Enterprising insurance companies make good use of these life tables, taking the probability of death at a given age and using it to calculate insurance rates that, statistically, guarantee a tidy profit.

Ecologists often collect similar information for the species they study, but they don't do it to maximize profits! They do it to gain knowledge and, often, to help protect species. Take, for example, ecologists concerned about the endangered red panda. They might follow a group of red pandas from birth to death. Each year, they would record how many pandas had survived and how many cubs had been born. From this data, they could better understand the *life history*, or typical survival and reproduction pattern, of their red panda group.

What's the use of a life history? In some cases, ecologists are just plain curious about how organisms live, reproduce, and die. But there is also a practical reason to collect life history data. By combining birth and death rates with a "snapshot" of the current population—how many old and young organisms there are and whether they are male or female—ecologists can predict how a population is likely to grow or shrink in the future. This is particularly important in the case of an endangered species, like the red pandas in our example.

Life tables

A *life table* records matters of life and death for a population—literally! It summarizes the likelihood that organisms in a population will live, die, and/or reproduce at different stages of their lives.

Let's start simply by taking a look at a basic life table that just shows survival—rather than survival and reproduction. Specifically, we'll focus on the animal below: the Dall mountain sheep, a wild sheep of northwestern North America.

For full disclosure, this data was collected in a pretty weird way. An ecologist named Olaus Murie hiked around Mount McKinley National Park in Alaska for several years in the 1930s and 1940s. Every time he came across the skull of a dead Dall mountain sheep, he used the size of its horns to estimate how old it must have been when it died^11start superscript, 1, end superscript. From the ages of the 608 skulls he discovered, he estimated survival and death rates for the sheep across their lifespans. [Why not just follow individual sheep?]

Below, we have a table based on Murie's skull collection data. To make it easier to read, the table is standardized to a population of 1000 sheep. As we walk through the table, we can picture what will happen, on average, to those 1000 sheep—specifically, how many will survive or die in each age bracket.

Let's walk together through the first row of the table. Here, we see that 1000 sheep are born, reach an age of zero. Of those sheep, 54 will die before they reach 0.5 years of age. That makes for a death, or **mortality**, rate of 54/1000, or 0.054, which is recorded in the far-right column.

Age interval in years	Number surviving at beginning of age interval out of 1000 born	Number dying in age interval out of 1000 born	Age-specific mortality rate—fraction of individuals alive at beginning of interval that die during the interval

0–0.5	1000	54	0.054
0.5–1	946	145	0.1533
1–2	801	12	0.015
2–3	789	13	0.0165
3–4	776	12	0.0155
4–5	764	30	0.0393
5–6	734	46	0.0627
6–7	688	48	0.0698
7–8	640	69	0.1078
8–9	571	132	0.2312
9–10	439	187	0.426
10–11	252	156	0.619
11–12	96	90	0.9375
12–13	6	3	0.5
13–14	3	3	1

Table adapted from Edward S. Deevey^22squared.

By looking at the life table, we can see when the sheep have the greatest risk of death. One high-risk period is between 0.5 and 1 years; this reflects that very young sheep are easy prey for predators and may die of exposure. The other period where the death rate is high is late in life, starting around age eight. Here, the sheep are dying of old age. [Why don't sheep die more between zero and 0.5 years?]

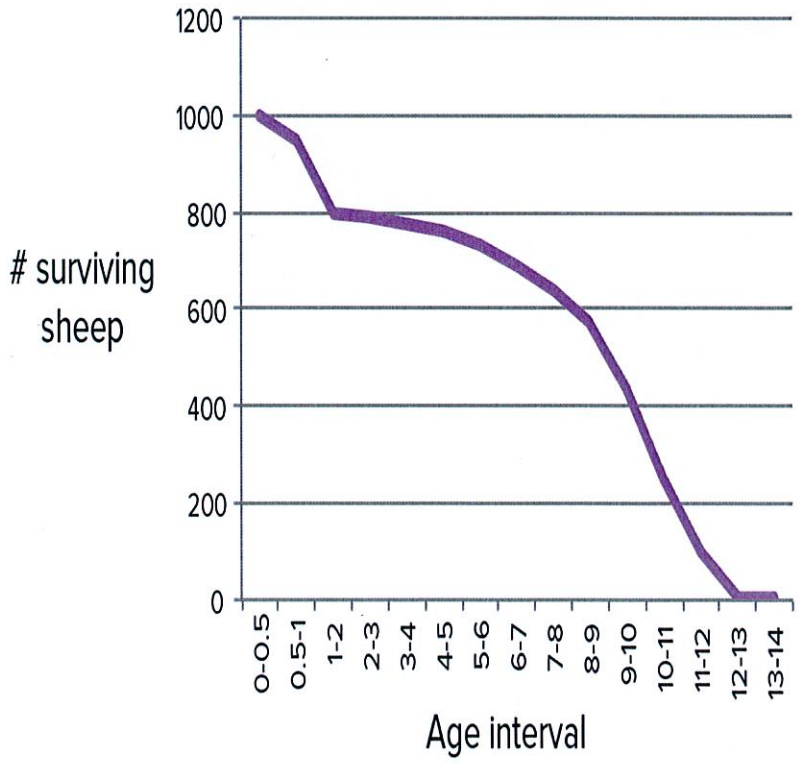
^2squared

This is a relatively bare-bones life table; it only shows survival rates, not reproduction rates. Many life tables show both survival and reproduction. If we added reproduction to this table, we would have another column listing the average number of lambs produced per sheep in each age interval.
[Did you realize you just made a horrible pun?]

Survivorship curves

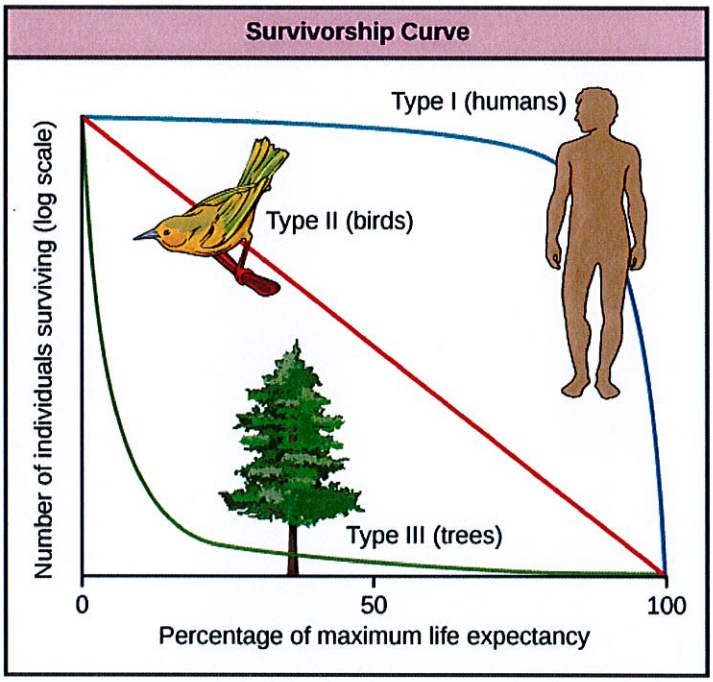
For me, a life table isn't the easiest thing to read. In fact, I'd rather see all that survival data as a graph—that is, as a *survivorship curve*.

A survivorship curve shows what fraction of a starting group is still alive at each successive age. For example, the survivorship curve for Dall mountain sheep is shown below:



The graph makes it nice and clear that there's a small dip in sheep survival early on, but most of the sheep die relatively late in life.

Different species have differently shaped survivorship curves. In general, we can divide survivorship curves into three types based on their shapes:



- **Type I.** Humans and most primates have a Type I survivorship curve. In a Type I curve, organisms tend not to die when they are young or middle-aged but, instead, die when they become elderly. Species with Type I curves usually have small numbers of offspring and provide lots of parental care to make sure those offspring survive.
- **Type II.** Many bird species have a Type II survivorship curve. In a Type II curve, organisms die more or less equally at each age interval. Organisms with this type of survivorship curve may also have relatively few offspring and provide significant parental care.
- **Type III.** Trees, marine invertebrates, and most fish have a Type III survivorship curve. In a Type III curve, very few organisms survive their younger years. However, the lucky ones that make it through youth are likely to have pretty long lives after that. Species

with this type of curve usually have lots of offspring at once—such as a tree releasing thousands of seeds—but don't provide much care for the offspring.

Age-sex structure

How can we use the birth and death rates from a life table to predict if a population will grow or shrink? To do this effectively, we need a "snapshot" of the population in its present state.

For instance, suppose we have two populations of bears: one made up mostly of young, reproductive-aged female bears and one made up mostly of male bears past their reproductive years. Even if these populations are the same size and share a life table—have the same reproduction and survival rates at a given age—they are likely to follow different paths.

- The first population is likely to grow because it has many bears that are in prime position to produce baby bears, cubs.
- The second population is likely to shrink because it has many bears that are close to death and can no longer reproduce.

So, who's currently in a population makes a big difference when we are thinking about future population growth! Information about the **age-sex structure** of a population is often shown as a **population pyramid**. The x-axis shows the percent of the population in each category, with males to the left and females to the right. The y-axis shows age groups from birth to old age.

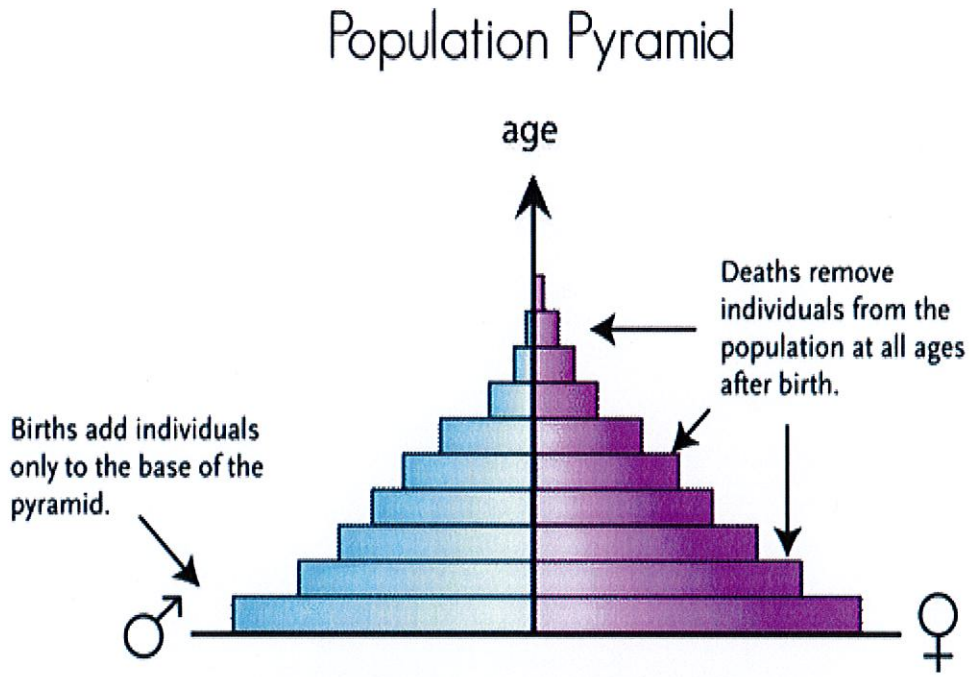


Image credit: *Population pyramid* by CK-12 Foundation, CC BY-NC 3.0

It's common to see population pyramids used to represent human populations. In fact, there are specific shapes of pyramids that tend to be associated with growing, stable, and shrinking human populations, as shown below.

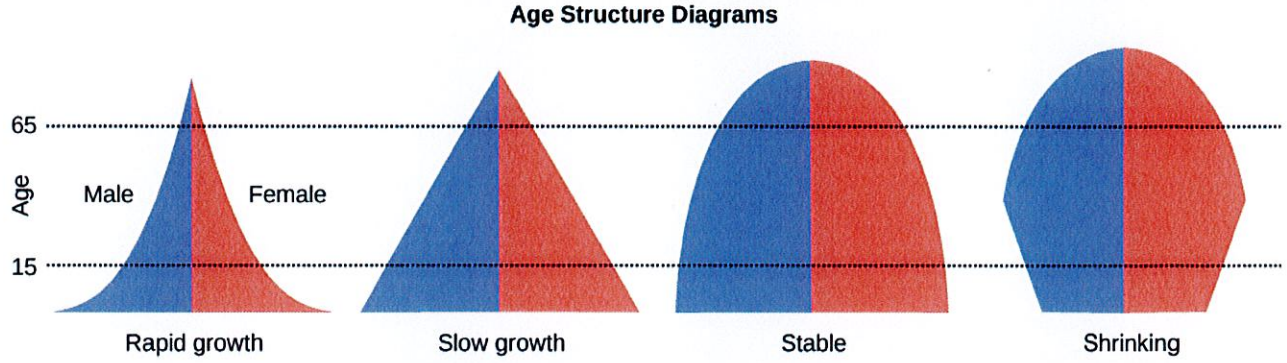


Image credit: *Human population growth: Figure 3* by OpenStax College, Biology, CC BY 4.0

- Countries with rapid population growth have a sharp pyramid shape in their age structure diagrams. That is, they have a large fraction of younger people, many of whom are of reproductive age or will be soon. This pattern often shows up for countries that

are economically less developed, where lifespan is limited by access to medical care and other resources.

- Areas with slow growth, including more economically developed countries like the United States, still have age-sex structures with a pyramid shape. However, the pyramid is not as sharp, meaning that there are fewer young and reproductive-aged people and more old people relative to rapidly growing countries.
- Other developed countries, such as Italy, have zero population growth. The age structure of these populations has a dome or silo shape, with an even greater percentage of middle-aged and old people than in the slow-growing example.
- Finally, some developed countries actually have shrinking populations. This is the case for Japan^33cubed. The population pyramid for these countries typically pinches inward towards its base, reflecting that young people are a small fraction of the population.

The basic principles of these human examples hold true for many populations in nature. Large fractions of young and reproductive individuals mean a population is likely to grow. Large fractions of individuals past reproductive age mean a population is likely to shrink.

Wednesday Science Homework-**Answer the Questions?**

Name; _____ Date_____

1.Why is Japan's population shrinking? Isn't it a developed country with good medical care?

2. Why are the developing countries shrinking while the 3rd world countries populations are growing shouldn't it be the other way around?

3. How the fourth age structure pyramid shows a shrinking population growth?

4. Can a population pyramid be used for animals?

5. In population growth, wouldn't disease also play a key role in an animal surviving?

analogy: the total amount of money you have in your wallet is the population, your income is the birth rate and your expenses represent the death rate. If you wanted to know how much money you have, you wouldn't care about *how* you had spent it, just about *how much* you spent. It is the same with population growth: you care about *how many* individuals died, not about *how* they died.

6. Insects will have which type of survivorship curve?

The diagrams below show three patterns of population dispersal.

Thursday- Friday- Read and learn how to protect yourself from Coronavirus disease

People may be sick with the virus for 1 to 14 days before developing symptoms. The most common symptoms of coronavirus disease (COVID-19) are fever, tiredness, and dry cough. Most people (about 80%) recover from the disease without needing special treatment.
More rarely, the disease can be serious and even fatal. Older people, and people with other medical conditions (such as asthma, diabetes, or heart disease), may be more vulnerable to becoming severely ill.

People may experience:

Cough ,fever, tiredness, difficulty breathing (severe cases)

DO THE FIVE

Help stop coronavirus

1

HANDSWash them often

2

ELBOWCough into it

3

FACEDon't touch it

4

SPACEKeep safe distance

5

HOMEStay if you can

There is no specific medicine to prevent or treat coronavirus disease (COVID-19). People may need supportive care to help them breathe.
Self care
If you have mild symptoms, stay at home until you've recovered. You can relieve your symptoms if you:
rest and sleep
keep warm
drink plenty of liquids
use a room humidifier or take a hot shower to help ease a sore throat and cough

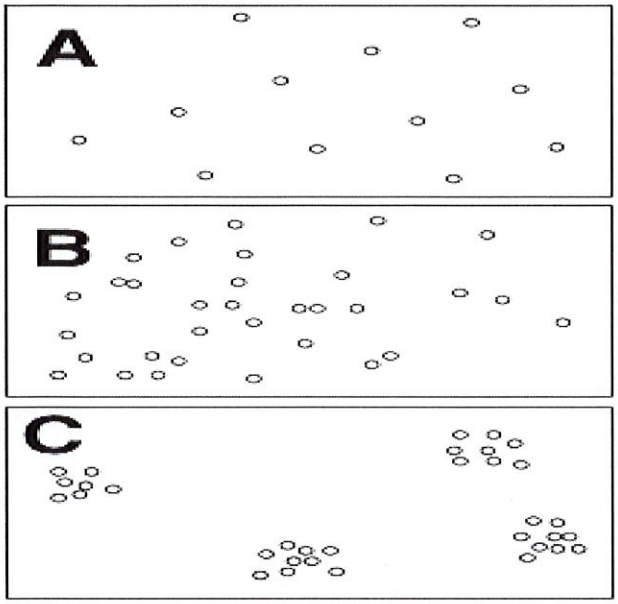
Medical treatments
If you develop a fever, cough, and have difficulty breathing, promptly seek medical care. Call in advance and tell your health provider of any recent travel or recent contact with travelers.

Viruses, Bacteria, Protists and Fungi

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

VIRUS
BACTERIA
PARASITE
BUDDING
CILIA
REPRODUCTION
FUNGI
SYMBIOSIS
BACTERIOPHAGE
ENDOSPORE
PROTIST
VACCINE
HYPHAE
MUTUALISM
ALGAE
PROTOZOAN
LICHEN
HOST

Friday -Population Ecology-Test



A - Population is evenly distributed B - Population is randomly distributed C - Population is clumped into groups

Which population is most likely to exhibit the dispersion pattern marked C?

Choose 1 answer:

Choose 1 answer:

- C

A
A population of hyenas live on a savannah where the only sources of water are several watering holes.

- C

B
A population of king penguins aggressively defend small territories within their habitat.

- C

C
Wind disperses the seeds of a dandelion population across fertile fields with nutrient-rich soil.

- C

D
A purple sage plant population releases chemicals from their roots that prevent competitors from growing in the area.

2. How does depth of water affect the population distribution of corals?

3. How does the population get that much rabbit for 1 month? So, the 1000 stays the same and the power changes? But what happens during the month a rabbit die will it still be 1000?

4. How is humans affecting growth of population?

Which of the following scenarios represents a density-independent limit on population?

Choose 1 answer:

Choose 1 answer:

- ☐

A
Caribou population growth is limited as a result of grass depletion.

- ☐

B
Woodpecker population growth is regulated by opossum predation of woodpecker eggs.

- ☐

C
Box turtle population growth is regulated by a hurricane that destroys their nests.

- ☐

D
Porcupine population growth is limited by the spread of a disease.

Name: _____ Date: _____

Human Population

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

aquaculture	natural resources	alternative energy	ecological footprint
sustainable	recycle	carrying capacity	limiting factors
biofules	nuclear fission	reduce	nuclear waste
nuclear energy	wave power	reuse	geothermal
solar energy	wind energy	nuclear fusion	hydro power