

Journey to the Bottomless Pit

Book by Elizabeth Mitchell

Unit study prepared by Cindy West

Throughout the Book

Keep a timeline of Mammoth Cave's history as you come across important events in the book. A complete timeline can be found at the end of the book. A printable is provided.

Photocopy Stephen Bishop's map of Mammoth Cave found in the cover of the book. As you read about a certain area of the cave, highlight it. Or make several copies of the map and have your children trace the various routes taken throughout the book.

A printable is provided for your student to keep a list of cave formations as described in the book.

Upon meeting a new character, complete a character study page. Compile these together into a character booklet when the book is complete. Before you begin your study, discuss the words and definitions below:

Dynamic- A character that goes through a significant amount of changes from the beginning to the end.

Static- A character that changes very little from beginning to the end.

Major character- The character that is represented the most. The plot usually revolves around this character.

Minor character- One of the characters represented in the story, but not the main character.

Conflict- A struggle between opposing forces (man vs. nature, man vs. man, man vs. God, man vs. self)

Vocabulary

cave – a hollow in the earth

carpenter – a person who builds or repairs wooden structures

guide – to assist a person traveling through an unfamiliar destination

spelunking – exploring caves
arch – something bowed or curved
pit – a naturally formed or excavated hole or cavity in the ground
passageway – a way of passing into, through or out of something
dome – a domical roof or ceiling
respect – to show regard or consideration for
nervous – uneasy or apprehensive
enormous – greatly exceeding common size
intersection – a place where two or more paths or roads meet
shaft – a vertical or sloping passageway leading to the surface
dissolve – to disintegrate, break up or disperse
tunnel – an underground passage
nudge – to prod someone into action
debate – a discussion involving opposing viewpoints
expert – a person who has special skill or knowledge in a particular subject or field
freedom – the power to make choices and decisions without constraint
emancipate – to free from bondage or slavery

Chapter 1 – The New Guide

Math - At the time Franklin Gorin bought the cave, he paid \$5,000. What can \$5,000 buy today? Take a peek through the for sale ads in the newspaper and make a list of things that are less than \$5,000, around \$5,000, more than \$5,000 and much more than \$5,000. Discuss with your child what you think Mammoth Cave could possibly be worth today. If desired, use the printable chart provided.

Social Studies (Slavery) – In 1838, Stephen was sent to work at Mammoth Cave and he had no choice because he was enslaved. Enslaved people were not paid for their work. They were owned by other people and had to do exactly as they were told or risk being beaten or even killed. They were often given jobs that required hard, back-breaking labor like hoeing huge fields or picking cotton. The hours they spent working were very long and often lasted 12 or 14 hours. Some enslaved people were a bit luckier and were given jobs in and around their owner's house doing things like cooking, laundry, tending the animals or attending the owner's family. Mostly women and young children were given the easier jobs. Shelter was often a shack and food was sometimes scarce. It was a hard, horrible life.

You may choose to explore this topic more by reading one of the nonfiction titles listed in the Library List. If desired, complete the corresponding notebooking page.

Science (Caves) – One of the first things Stephen noticed upon entering the cave was the coolness. Mammoth Cave is made mostly of limestone. The limestone rock is, for the most part, completely underground. Since there is no way for the sun to warm up the air in the cave or the wind to cool down the air, the temperature remains a steady 54 degrees all year long. Use a thermometer to measure and record the temperature in various places around the house – the refrigerator, the freezer, a bathtub full of water, a pot of soil, a basement, an attic, etc. Complete the temperature record form.

Science (Bats) – Caves are an important habitat for bats. Not all bats need caves to survive, but some types do. Cave ceilings provide a typically safe sleeping place for bats. Since they are nocturnal and sleep during the day, the darkness of a daytime cave and the height of the cave ceilings provide a safe shelter. Typically, cave bats live in very large groups (even into the millions!) and fly out of the caves at night together. Before leaving the cave to find food, they prepare by all flying around inside the cave at the same time. This creates lots of noise and chaos. Imagine yourself wandering into the cave at just this time! Complete the bat notebooking page.

Language Arts (Foreshadowing) – Foreshadowing is a technique an author uses to clue the reader in on something that may happen later. It can be defined as to represent, indicate, or typify beforehand.

Reread page 9, “Although he had spent only a few minutes inside this cave, already he was learning its secrets. He was sure the cave would reveal many more.” And reread page 11, “Stephen made a promise to himself. One day, he would find out what was at the bottom of Crevice Pit.” What do these two sentences tell about what might happen later in the story?

Chapter 2 – The Church and the Steamboat

Language Arts/ Comprehension - Even though Stephen was an enslaved person, he considered himself lucky. Why did Stephen consider himself lucky? What were other enslaved people doing at the time that was harder work? How do you know he considered himself lucky? Just because Stephen had a better life than some, was it right for someone else to own him?

Science (Stalactites and Stalagmites) – Stalactites and stalagmites are icicle shaped formations of rock found in caves. Stalactites (c = ceiling, tite = hold on tight) are attached to the ceiling of a cave and look sort of like an icicle hanging from the roof of you house in the winter, except made of rock. Stalagmites (g = ground, mite = has to use its mite to push up from the ground) are attached to the floor of a cave and look as if an upside down icicle is pushing up from the ground. This is not true of course. As water drips through cracks in a cave, it carries tiny deposits of calcium that are picked up from rolling down the rock. Those bits of calcium are left behind as the water evaporates, forming the stalactites. As water drops from the ceiling or runs off stalagmites to the ground, the calcium deposits build up creating stalagmites.

You might do a quick internet search for pictures of stalactites and stalagmites. Your student may want to create a poster that shows both stalactites and stalagmites and illustrates how to remember the difference between the two.

Language Arts (Foreshadowing) – Reread page 17, “Again, Stephen had the feeling that there was much more of Mammoth Cave waiting to be explored.” Reread page 23, “Stephen had the sense of much more space around him. It could be above his head or deep beneath his feet. Wherever it was, he would find a way in.” What do you think is going to happen in the story soon?

Chapter 3 – The First Discovery

Social Studies (Slavery) / Comprehension – This chapter mentions this was the first time Stephen had ever owned a pair of nice clothes. How did that make him feel? Stephen was determined to do a good job as a tour guide. Why?

Social Studies (Native Americans) / Art – Native Americans used the caves as dwellings, for working and even exploring. When you visit the Discovery Tour at Mammoth Cave today, you go through a room with artifacts left behind by the Native Americans. Clay pots are one of those items. Try your hand at creating a coil pot or pinch pot out of clay.

For a coil pot, roll the clay out into the shape of a long, skinny snake. Then wind the clay into the shape of a circle and continue winding until the pot looks like a coil.

For a pinch pot, roll the clay into a ball. With your thumbs, press down into the middle of the ball forming a hole. Holding the ball in your hands, continue to work your thumbs into the middle until you have a nice pot shape. Finally, pinch the rim like you might pinch a pie crust.

Science (Wind) – Why was wind blowing out of the cave? Air pressure inside a cave and air pressure outside a cave attempt to reach equilibrium. When the barometer rises, wind blows into the cave. When the barometer falls, wind blows out of the cave.

Try measuring the barometer yourself with this experiment. [Source](#)

Materials:

- glass mayonnaise or canning jar
- balloon
- straw
- toothpick
- glue
- index card

Process:

Stretch a piece of balloon over the glass jar. Glue a straw sideways from the center of the balloon to the end of the jar. Glue a toothpick to the end of the straw. On an index card write 'High' on top and 'Low' on the bottom near the toothpick's point. Watch and see what happens.

Explanation:

Barometers keep track of air pressure. When air pressure is high (which means fair weather), the toothpick will point up because air will be pressing down on the balloon. When air pressure is low (which means stormy weather is coming), the toothpick will point down because air inside the jar will be pushing up against the balloon.

Language Arts (Foreshadowing) – Reread page 34, “He had a feeling that some thrilling sight was just waiting to be discovered. He wanted to be the one to discover it.” This foreshadowing actually revolves more around the second sentence. Stephen did make a discovery. What do you think the second sentence might foreshadow?

Bible/Character (Observing the needs of others) – Stephen was able to determine through observation that the woman might be afraid and took steps to calm her beforehand. Have you ever been able to sense that someone was afraid or timid? What steps did you take to help them?

Chapter 4 – Across the Bottomless Pit

Social Studies (Slavery)

Stephen made a discovery! Sadly, he was not given credit for the discovery in the press release that Mr. Gorin sent out. Why do you think this was so? Even so, the press release brought new visitors to the cave which allowed Stephen to meet someone willing to share in his excitement and desire to explore more of the cave. Pretend that you are Mr. Gorin and rewrite the press release in a way that gives Stephen credit for the discovery.

Social Studies (Teamwork) – It took teamwork to make it across the Bottomless Pit. Tell of a time you couldn’t have completed something without teamwork. Also, notice Stephen’s encouragement when he knew Mr. Stevenson was very afraid. He again used his keen sense of observing the needs of others. He said, “Don’t look down.” This gave Mr. Stevenson just the courage he needed to continue across. How have you encouraged someone recently?

Science / Geography (Caves) – Caves are found all over the world. This chapter particularly mentions Mr. Stevenson had explored caves in Europe. Color Europe on a blank map of the world. If desired, research one or more of the caves in Europe.

Chapter 5 – A New Master

Social Studies (Slavery) / Critical Thinking – Again, Stephen was not credited with the new discovery. The cave was gaining more interest and Stephen was kept busy with tours lasting as long as 12 hours each! Luckily, Stephen was allowed to train tour guides to help him. In his free time, he was learning to read and still exploring the cave as often as possible. Many enslaved people were not allowed to learn to read. What might be reasons the owners would not want their enslaved people to learn to read?

This would be a good time to read More Than Anything Else by Marie Bradby about a little boy after the Emancipation who learns to read.

Social Studies (Slavery) / Comprehension – When Dr. Croghan bought the caves, enslaved people, and Inn from Mr. Gorin, the enslaved people were worried. Why do you think they were worried?

Science (Caves) – Limestone caves are formed when water erodes away the rock. Much evidence suggests that most of the huge caves around the world were created during the flood of Noah's time.

You can create your own mini cave using sugar cubes, clay and water! Use six ounces of clay and 6 to 12 sugar cubes. The clay represents hard rock (like sandstone), and the sugar represents limestone (an easily dissolved rock.) Mold the clay around the sugar cubes, being careful to leave at least part of a sugar cube exposed. By arranging the sugar cubes, you will determine the shape of your cave. When finished constructing the cave, leave it to dry for several days, then soak the structure in water. The sugar will dissolve, leaving hollowed out spaces, or caves.

Science (Cave Animals) – The fish that Stephen grappled had no eyes. God has created animals so that they are able to adapt to their particular situations or

surroundings. Since there is no light deep in a cave, the animals living in the deepest, darkest parts have no need for eyes. Cave animals also tend to be albino (white) because they lack skin pigment since they need neither sun protection nor camouflage. Choose one of the following cave dwellers to research. Create a model of the animal you chose and present an oral report about the animal.

Terms	Meaning	Example
Troglobites	Literally "Cave Dwellers" can pass their life history either in cool, dark, moist areas outside the cave or in caves if there is sufficient food.	Flatworms, Isopods, Amphipods, Eyeless cave shrimp, cave crayfish, bristletails, collembola, booklice(?), eyeless fish, cave beetles.
Troglophiles	Literally "Cave Lovers" can only complete their life histories in caves.	Segmented worms, snails, copepods, spiders, phalangids, mites, pseudoscorpions, millipedes, cave crickets (Hadenoeucus), booklice (?)
Trogloxenes	Literally "Cave Guests" cannot complete their life history in the cave.	Crickets, bats, pack rats, flies and gnats.
Incidentals	Can enter caves only occasionally.	Raccoons, frogs, humans.

[Source](#)

Language Arts: Research--

By reading newspapers, Stephen learned that the states were divided on the issue of slavery and that when Michigan became a state in 1837, there were 13 pro-slavery states and 13 free states in the Union. Research what those states were and make a list of those 26 states, categorized by their position on slavery. If desired, use the corresponding notebooking page.

Chapter 6 – Under Crevice Pit

Language Arts (Writing) - In Stephen's time, word was spread by newspaper. This could be a slow process. In our time, news can be spread almost as soon as it happens through the use of TV, radio and internet. Pretend to be a reporter on either the TV or radio, or a writer for a news site on the internet. How would you present news of a discovery at Mammoth Cave?

Science (Cave Safety) –

Always tell someone where you are going and when you can be expected to return; obtain permission from the owner of the cave for the visit.

Respect gates, whether they are in the field or at the cave entrance.

Never enter a cave alone.

Always carry several sources of light; do not depend solely on flashlights.

Make sure you have proper equipment in good working condition.

Never go beyond your physical and technical capabilities.

For the sake of conservation, keep visits to a minimum.

Better yet, meet with knowledgeable and experienced cavers. Association with a group of experienced spelunkers is the best safety insurance that you can have.

[Source](#)

Music – Enslaved people would often sing songs that seemed like innocent spirituals or hymns. In reality, they were songs with hidden meanings in the lyrics. The songs communicated secret messages and information about the Underground Railroad. They would sing as they'd go about their daily work.

Since singing was such a normal occurrence, the owners wouldn't be suspicious of the meaning behind the songs. You might read a book about the Underground Railroad from the Go-Along list below, then sing through an old spiritual like "Wade in the Water" and talk about its meaning. (This song was used to warn enslaved people to walk through water to throw off their scent from the dogs the owners would chase them with.)

Chorus:

Wade in the water,

Wade in the water children.

Wade in the water
God's gonna trouble the water

Who's all those children all dressed in Red?
God's gonna trouble the water.
Must be the ones that Moses led.
God's gonna trouble the water.

Chorus

What are those children all dressed in White?
God's gonna trouble the water.
Must be the ones of the Israelites.
God's gonna trouble the water.

Chorus

Who are these children all dressed in Blue?
God's gonna trouble the water.
Must be the ones that made it through.
God's gonna trouble the water.

Chorus

Look for more spirituals with hidden meanings. Read through the lyrics of one (or more) songs and complete the secret-message songs notebook page.

Chapter 7- The Underground Hospital

Social Studies (Medical History)/ Science (Careers) – Tuberculosis or Consumption is a bacterial infection found in the lungs, but able to spread to other parts of the body. It is spread easily through coughing or laughing. Today, there are medicines to help heal someone with tuberculosis, but in Stephen's time, there were not. Can you think of a disease now that doctors have a hard time treating successfully? Do

you think there is a possibility that cures might be found in the future? What kind of profession should a person go into if they'd like to help find cures for diseases?

Geography (Kentucky) – Using an atlas locate Mammoth Cave and record it on a map of Kentucky. Find Louisville, where Dr. Croghan's office was located, and map the journey from Louisville to Mammoth Cave.

Chapter 8 – Stephen Draws a Map

Geography (Map Making) – In 1842, Stephen took on the huge task of drawing a map of Mammoth Cave as he knew it. The official name for map drawing is cartography. Practice being a cartographer by drawing a map of your room, your house, your yard, a local park, or something else of interest. Be as accurate as possible and label the map well.

Social Studies (Traditions in Slavery and Marriage) – Stephen met the woman he wanted to marry. In these times, formal marriage ceremonies for enslaved people weren't allowed. Jumping the broom was a symbolic thing a couple did in front of witnesses to let the members of the community know they were married. Once Black Americans were free and could practice European-style marriages with rings, there was no longer a need for jumping the broom.

Chapter 9 – Free at Last?

Social Studies (Events in History) – This chapter mentions several important events going on in the 1840's. The early to mid-1800s brought many changes for America. It may be helpful to your child if he has a glimpse of what was happening across the country at this time.

In the Southwest, a battle was brewing in the then Mexican colony of Texas, where a group of American fighters were forced into the Alamo refusing to surrender. Despite losing the battle, Texas became an independent state in 1836.

In the South, plantation owners became increasingly oppressive; using more enslaved people as the demand for cotton increased. The Underground Railroad was being developed to help them escape from the harsh treatments.

As the South was focusing its energies on the cotton and slave trade, the Northeast was pouring its resources into the first factories in the United States. There was also an influx of immigrants from Europe to the New England area from 1820-1860.

After the Louisiana Purchase in 1803 more and more people began moving farther west, bringing an end to the American Frontier. So that your child can properly place these events in history, make mention that it was after the Revolutionary War and before the Civil War.

Encourage your child to choose one or more of these topics to read a book about. Give an oral narration of what you learn.

Mexican War

Gold Rush

Westward Expansion

Unrest and Division over Slavery

Immigrants arriving in US

Underground Railroad

Liberia/American Colonization Society

Social Studies (Famous People of the Time) – The following famous people were mentioned in this chapter as having come to visit Mammoth Cave. You may wish to choose one of them to find more about.

Jenny Lind – a singer called the “Swedish Nightingale”

Ole Bull – a Norwegian violinist

Prince Alexis of Russia

Dom Pedro of Brazil

Frederick Douglass

Social Studies / Geography (Slavery) – When Dr. Croghan died, the enslaved people at Mammoth Cave were afraid they would be “sold down the river.” This meant they might be taken to an auction and sold to the highest bidder. Families could be sold to different owners and if this happened, it was likely they would never see

one another again. Lexington, KY was the main place to sell in Kentucky. Locate Lexington on your map of Kentucky. Why do you think Lexington might have been the selling town?

If you're interested, this would be a good time to read Nettie's Trip South by Ann Warren Turner. It's not a long book, but it is very moving and for mature children. Nettie is a northerner who visits the south with her brother. She witnesses a slave auction and is horrified.

After the Book Activities

Writing – In order to promote a tourist attraction, travel brochures are often made to entice people to visit. The brochure will include things like pictures of the attraction, what makes it exciting, a description of the many things you can do there and what other attractions are close. Think back to Mammoth Cave during Stephen's time. Create a travel brochure that might have been used to entice people to make the long trip to the cave in the 1800's.

Writing – Write a letter to Stephen telling him what you think about the life he led.

Art – Use charcoal pastels to create a piece of art similar to one of the illustrations in the book.

Cooking

Black-Eyed Peas

- 1 pound black-eyed peas -- dried
- 1 piece skin from a smoked ham or
- 2 ounces slab bacon – diced
- 1/4 cup drippings (from bacon, fried chicken, etc.)
- 3/4 teaspoon salt
- 1/4 teaspoon black pepper, ground
- 1/2 teaspoon sugar

- 1) Rinse the peas well and soak them in cold water for 20 minutes. Drain well.
 - 2) Combine the peas and the remaining ingredients in a large pot. Pour in enough cold water to cover the peas by 1inch. Heat to simmering and cook, covered, until the peas are tender but not mushy, about 1 1/2 hours. Keep an eye on the peas while they are cooking and add more water to keep them covered if necessary.
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Library List

Mammoth Cave National Park by Mike Graf

Mammoth Cave and the Kentucky Cave Region (Images of America) by Bob Thompson

Mammoth Cave National Park Reflections by Raymond Klass_

The Hidden World of Caves: A Children's Guide to the Underground Wilderness by Ronal Kerbo

If You Lived When There Was Slavery by Anne Kamma

If You Traveled on the Underground Railroad by Ellen Levine

Sweet Clara and the Freedom Quilt by Deborah Hopkinson

Follow the Drinking Gourd by Jeanette Winter

Addy: An American Girl Series by Connie Porter and Dahl Taylor

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Mammoth Cave's History

Date	Event

Character Study

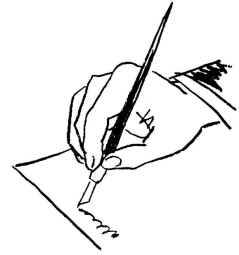
Character's Name _____

Major character

Minor character

Static character

Dynamic character



Physical Appearance	
Strengths	
Weaknesses	
Conflict	

I like don't like this character because _____

arch

rotunda

pit

ledge

tunnel

stalagmites

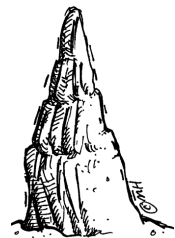
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column

drapery

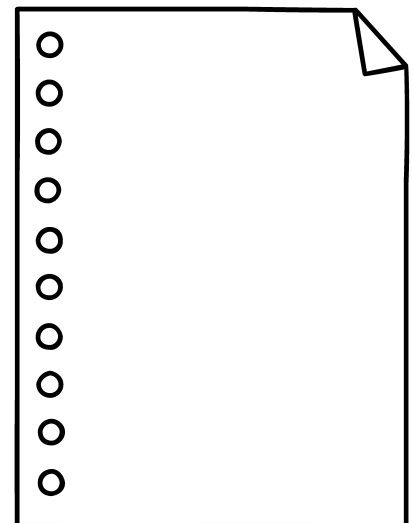
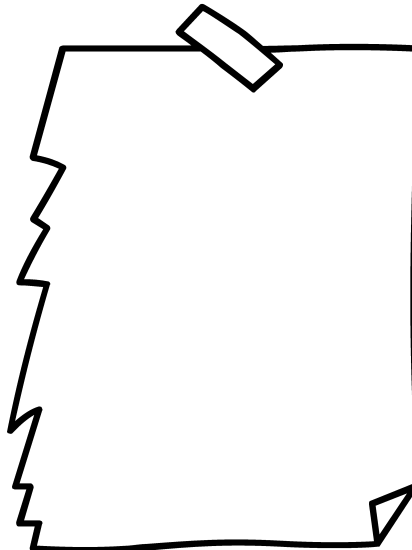
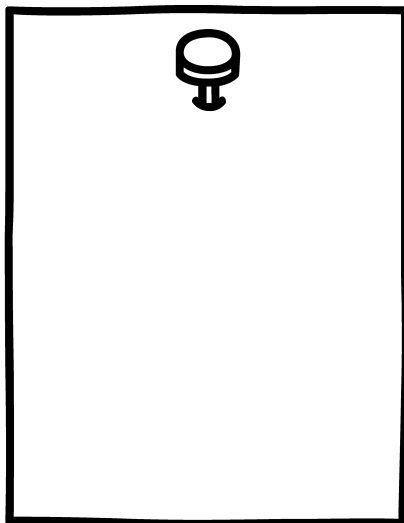
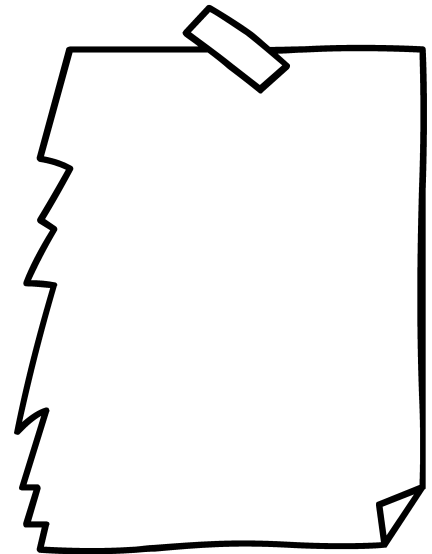
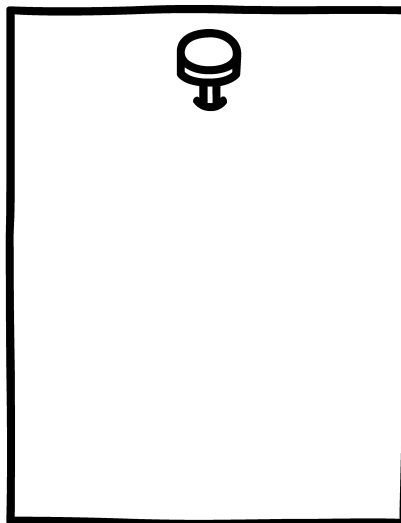
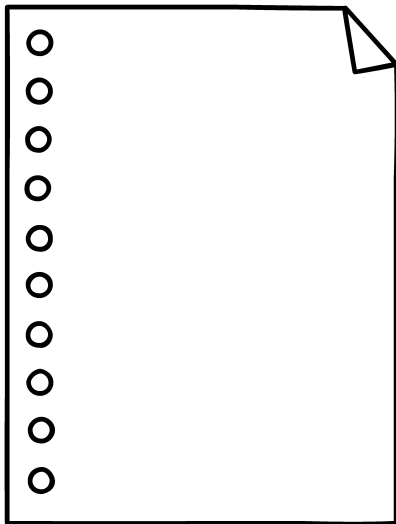
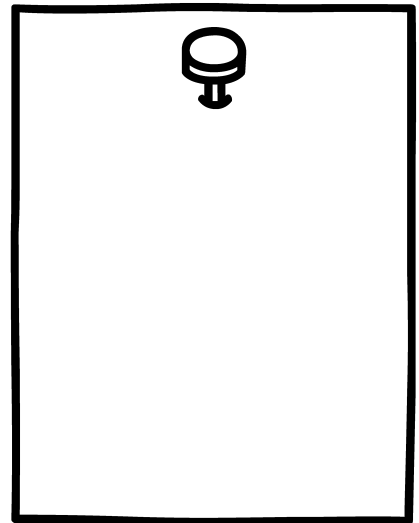
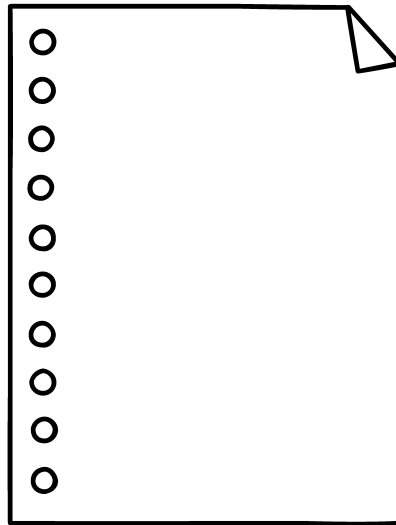
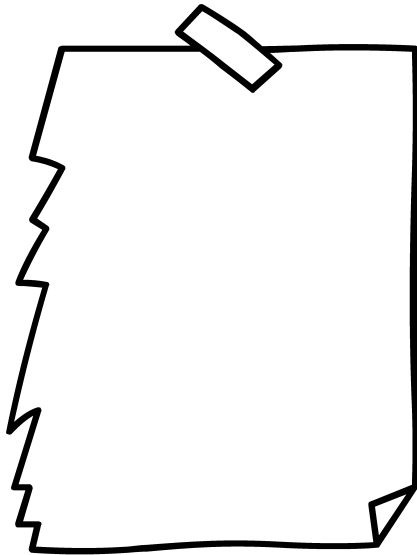


CAVE FORMATIONS



Journey to the Bottomless Pit

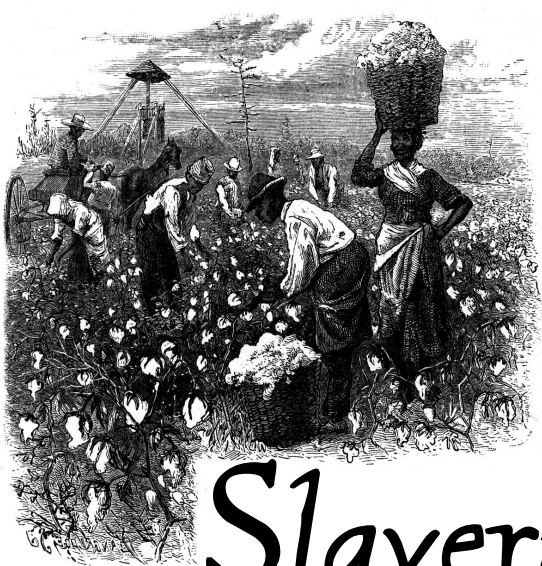
Add new words and definitions to the papers below.



\$5,000!

<i>Less Than \$5,000</i>	<i>About \$5,000</i>	<i>More Than \$5,000</i>	<i>Much More Than \$5,000</i>

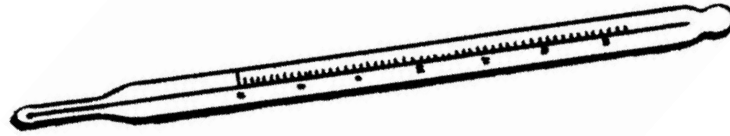
How much do you think Mammoth Cave is worth today?



Slavery

Handwritten text area consisting of 15 horizontal lines for notes.

Temperatures

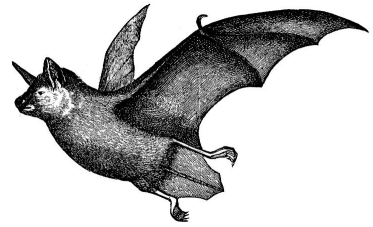


Place	Temperature

Conclusions



BATS



Anatomy

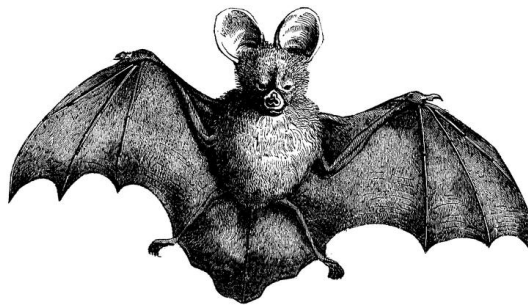
Habitat

Circle one

Bird
Reptile
Mammal
Amphibian
Fish

Circle one

Eggs
Live Birth

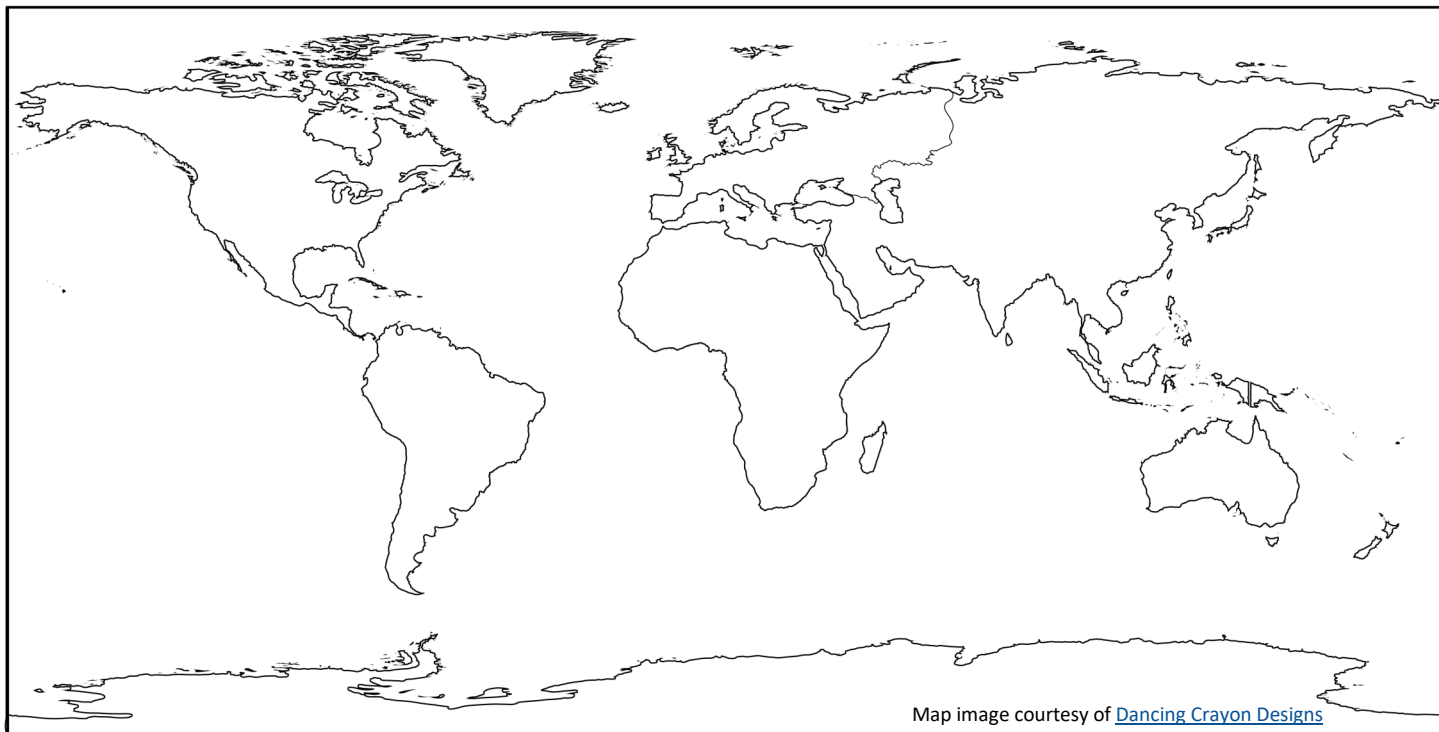


Diet

Interesting Fact

Mr. Stevenson explored caves in Europe.

Where is Europe?



Caves in Europe

In our story, it is mentioned that with the statehood of Michigan in 1837, there were 13 free and 13 slave states. What states were they and what was their position on slavery?

The United States of America in the year 1838

Free States

Slave States

SECRET-MESSAGE SONGS

Phrases with Hidden Messages	Possible Meaning



Jenny Lind

Dates Lived _____

Place of Birth _____

Biographical Information

Claim to Fame _____

Interesting Information _____

Ole Bull

Dates Lived _____

Place of Birth _____

Biographical Information

Claim to Fame _____

Interesting Information _____

Prince Alexis

Dates Lived _____

Place of Birth _____

Biographical Information

Claim to Fame _____

Interesting Information _____

Dam Pedro

Dates Lived _____

Place of Birth _____

Biographical Information

Claim to Fame _____

Interesting Information _____

Frederick Douglass

Dates Lived _____

Place of Birth _____

Biographical Information

Claim to Fame _____

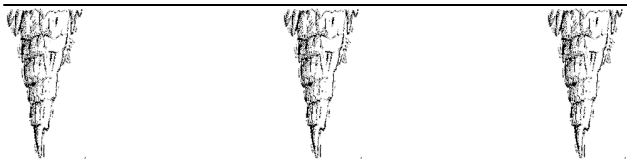
Interesting Information _____

CAVE RESEARCH

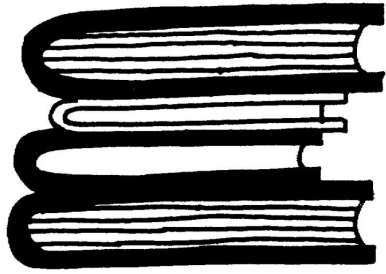
Name of Cave

Location

Size



About This Cave



My Supplemental Book Log

Journey to the Bottomless Pit

Book Title	Simple Summary	My Opinion
		