# Cavern Tour Project Kit

Congratulations! You're going on a Cavern Tour! Use these project ideas to enrich your educational experience. Read through them before you go to make sure you understand the terms and concepts, and to help you determine if you want to expand upon any of them. You'll find fun facts and printable worksheets at the end of this packet.

a- elementary level activity  b- middle school level activity  c- high school level activity

**Language Arts**

Caves inspire the imagination. What would it be like to live in a cave? Or be the first one to discover it? What kind of adventures can you imagine happening in the cave?

a. Draw a storybook or write a short story with illustrations inspired by the caves.
b. Write a short story inspired by your visit, including a main character and the main elements of a story (setting, plot, conflict, and resolution).
c. Choose between writing a fictional first-person narrative or a screenplay inspired by your visit.

Materials required: Notebook, pen/pencil
Submission: A copy of your writings/drawing, and any pictures/videos

Teaching or learning notes:

**Applied Math**

Mathematics is a tool scientists use to describe and predict the nature of caves. As slightly acidic water leaches through the limestone, it moves in mathematically predictable ways to create stalactites (which grow from the ceiling down--and have to hang on “tite”) and stalagmites (which grow from the ground up--with a lot of “mite”). Explore the beautiful geometry of caves!

a. Go on a shape hunt. Draw and label the shapes you find. Also, draw a representation of at least two patterns you find.
b. Look closer at one feature of the cave. Can you identify the mathematics in nature which created the feature? Can you describe the type of math that could be used to describe the formation of the feature, or predict what it will look like in the future? Draw a picture of your chosen feature and label it with the math you’ve discussed.
c. Find a part of the cave currently forming (there is water activity). Measure the rate of formation by recording the water movement and estimating deposition. Ask your guide for more concrete numbers so you can calculate and predict a future event in the life of that formation. Record the formation, the future event, and the math you used to make your determination.

Materials required: Notebook, pen/pencil, calculator or smartphone (optional)
Submission: Your calculations, estimations, and conclusions, and any pictures/videos

Teaching or learning notes:

**Science**

Cave geology is fascinating! Pay attention on your tour to learn more about how caves are formed. Do they require special kinds of rocks and/or minerals to form large caverns? What chemical changes are occurring to cause the caves to form?

a. Draw a simple diagram about how caves form. Include labels.
b. Draw a labelled diagram about cave formation. Include a timeline of events which contribute to cave formation.
c. Learn more about the cavern your tour focuses on. Draw a map of the cave labelling major formations and detailing how they were formed. Include a timeline with the specific history of your cavern.

Materials required: Notebook, pen/pencil
Submission: A copy of your drawings, diagrams, or designs, and any pictures/videos

Teaching or learning notes:

**Social Studies**

Caves can provoke many emotions in people. Some people experience fear, some wonder, some tranquility, and others excitement. Try to understand the people in our group better by observing them in the caves. How are they feeling? What is the most prevalent emotion? How does the tour guide handle the different emotions?

a. Draw or write about some of your observations on the human reaction to caves.
b. Choose one of the emotions you identified. Write about how many times you saw it, if it is a common emotion for this experience, and how you can best interact with someone experience that emotion.
c. Choose one person in your immediate group to observe more carefully. How does their emotion change over time. Were there any events which caused emotional changes? Did they need help? Did they make things more fun? Interview the person you chose to get a first-hand account of the event and their feelings. Record all your findings, your interview, and a short conclusion about how caves can evoke many emotions.

Materials required: Notebook, pen/pencil
Submission: A copy of your writings/drawings, and any pictures/videos

Teaching or learning notes:

# Fun Facts

- For 150 years, visitors have enjoyed the unique delicate beauty of the cavern's crystalline formations.

- The scientific study of caves and their surrounding environments is called Speleology and the formation and development of caves called speleogenesis.

- Recreational or scientific exploration of a cave system is called caving, potholing or spelunking.

- Stalactites and stalagmites can eventually join from floor-to-ceiling, however they grow very slowly, around an inch every 100 years!

- The deepest known cave is Voronya Cave in Georgia, at 7,208 ft.

- Caves have been used throughout human history as shelter, for burials, and as religious sites. Many archaeological treasures and ancient paintings have been found in caves around the world.

- Troglobites are a type of animal that only live within cave ecosystems, they often have some unique characteristic such as a loss of pigment coloring and no eyesight or eyes which developed due to the extreme darkness. (Are there any troglobites in the caves you are visiting?)

- Moaning Cavern holds the largest vertical chamber in a public cavern that you can see in California. In fact, it's so big, it could hold the entire Statue of Liberty!

# Cavern Tour

1. Draw a picture of the entrance to the cavern.

2. Describe your favorite part of the tour and why.

3. What is one thing you learned about groundwater?

4. Draw or describe a stalactite.

5. Describe or draw a stalagmite.

6. Are there any creatures that live in the caves?

BONUS:

Explain how caves are formed. What kind of rock are they made out of? What makes the caves so large? How do they begin? Do they ever collapse?