CINCINNATI MUSEUM CENTER AT UNION TERMINAL

Museum of Natural History & Science
Gallery Guide for *The Cavern*

Introduce your students to the land underground. Our exhibit will spark the spelunker in your students as they explore, via two distinct trails, *the Cave*. Through cave exploration, students will learn about cave formation, geological forces, cave biology and even cave conservation.

Concepts: accidentals, angel hair, capstone, cave flowers, column, dissolution cave, echolocation, gypsum needles, karst topography, sinkhole, snowballs, soda straws, speleothem, spelunker, stalactite, stalagmite, troglobites, trogloxenes, troglophiles

Background Information:
The key to cave formation is **karst topography**. Karst topography is one that has **sinkholes** that allow for the formation of caves. It is also important to realize that there is a formula to cave formation:

Carbon dioxide + rock + water + time = Formation of a cave

Carbon dioxide is provided through the release of carbonic acid into the limestone. Rock is necessary as the formula calls for both limestone and sandstone. Limestone will dissolve under the emergence of the carbonic acid, thus producing a cavity or hole. However, caves must have a roof and that is provided by what is referred to as a **capstone**. Sandstone does not decay with carbonic acid and is often the capstone of a cave. The cave is actually formed by the layering of limestone and sandstone to produce the chamber of the cave. Water is needed to help hollow out the cave, forming a **dissolution cave**, and limestone gives way to the erosional effects of water. The last and most vital ingredient in the formula is that of time. It takes millions of years for a cave to form. For more exploration, introduce your students to the water cycle and discuss the similarities and differences between them.

Within the cave are many cave formations, also referred to as **speloethems**. Some of the most common cave formations include: **columns**, **stalactites** and **stalagmites**. Other speleothems are named after objects that they resemble, for example **soda straws**, **snowballs**, **gypsum needles**, **cave flowers** and **angel hair**. All of these speleothems can be found in *the Cave*'s advanced trail formation room when acting as a **spelunker** in the exhibit.

Cave biology is also an important aspect of this exhibit. There are two types of life inside a cave: accidentals and TROGS. **Accidentals** are animals that enter a cave unknowingly and are not able to survive permanently in a cave. An example of an accidental is a turtle that falls into the cave from above. **TROGS** stand for trogloxenes, troglophiles, troglobites. **Trogloxenes** are animals that can survive in a cave, although they normally live around the entrance. An example is a beetle. **Troglophiles** love caves and can spend their entire lives either inside or outside of a cave. An

example of a troglophile is a raccoon. **Troglobites** are cave dwellers and live in caves permanently. Troglobites have adapted to life in a cave and if taken from their cave environment will not survive. An example of a troglobite is a cave fish.

Vocabulary:

Accidentals – animals that enter a cave unknowingly and cannot survive permanently in a cave
Angel hair – very thin, flexible mineral filaments of gypsum
Cave flowers – gypsum formation in the shape of flowers
Capstone – often sandstone, which acts as a barrier to erosion and therefore creates the roof of a cave
Column – when a stalactite and stalagmite meet; a cave formation from floor to ceiling
Dissolution Cave – formed from carbonic acid dissolving a limestone cavity
Echolocation – a method used by bats to locate prey as well as their surroundings
Gyspum needles – gypsum fibers that form in the shape of thin needles
Karst topography – area formed by dissolving rock, underground drainage with little surface drainage
Sinkhole – evidence of karst topography and possible cave formation
Snowballs – mineral deposit that takes shape of a snowball
Soda straws – young stalactites in which water flows through their hollow middle
Speleothem – a cave formation
Spelunker – someone who explores caves
Stalactite – formations that hang from the ceiling formed by the dripping of carbonic acid
Stalagmite – formations that protrude from the floor formed by the carbonic acid dripping from the ceiling
Troglobite – animals that live and have adapted to life within a cave; they could not survive if removed from cave environment
Trogloxenes – animals that live within a cave, but only at its entrance
Troglophiles – animals that can spend their entire life either in or out of the cave environment

Focus Questions:

1. Discuss with your students the processes behind cave formation. Using this knowledge, have your students discuss the formation processes of our cave. Upon return to the classroom, research other types of caves, such as tectonic or erosional caves.
2. What is a speleothem? Have students describe and name each speleothem. For further discussion, explore the true names of speleothems. Do they agree or disagree with their naming?
3. Name the animals found in and around our *Cave*. Discuss the adaptations that each species has employed for its survival.