



# CRINOID RACE

**GRADE LEVEL:** 6 - 9

**TIME REQUIREMENT:** One class session

**SETTING:** Indoors in a gymnasium or outdoors

**GOAL:** To learn to identify fossils by participating in a relay race.

**OUTCOMES:** At the end of this lesson, presented with several choices, the student will:

- identify the type of rock in which fossils are found,
- identify at least three types of fossils,
- select a component of sandstone,
- select a component of limestone,
- select a component of shale,
- identify sandstone rock,
- identify limestone rock,
- identify an agent of change, and
- identify one thing needed for fossilization to occur.

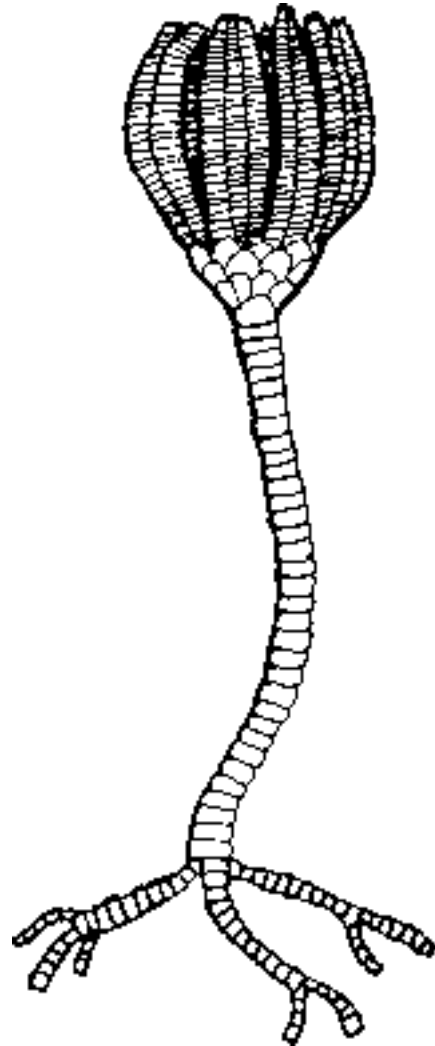
**KERA GOALS:** Meets KERA goals 1.3, 3.3, 3.7, 4.1, 4.2, 4.4, 4.6, 5.1, 5.3, 5.4, 6.1, 6.2

## BACKGROUND INFORMATION

This culminating activity is best used after students have gained some experience in identifying the different types of fossils found at Mammoth Cave National Park. They should also have some basic knowledge of the different types of sedimentary rocks.

## MATERIALS NEEDED

1. Three boxes to hold the objects. Each box will contain:
  - A selection of fossils (including crinoids, gastropods and brachiopods)
  - A container of sand
  - A container of water
  - A piece of sandstone
  - A piece of limestone.
  - A container of mud
  - An insect skeleton (or chicken bone)
  - Several leaves
2. Crinoid Race Clue Sheet
3. Paper and pencil for keeping score



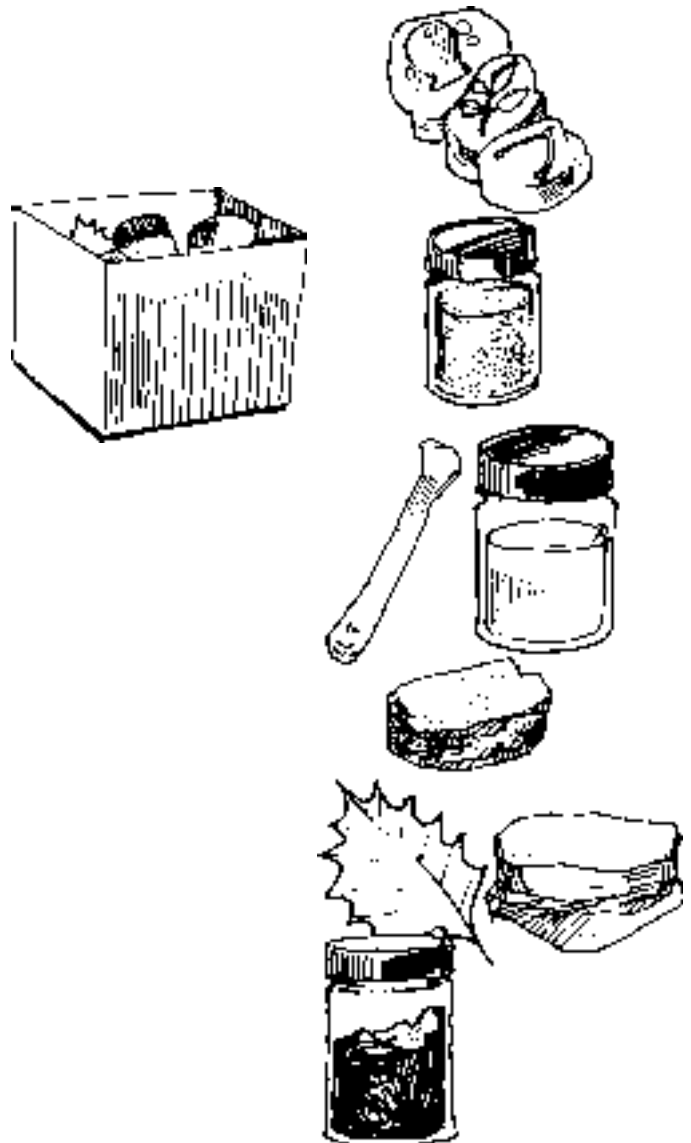
# CRINOID RACE

## PROCEDURE

1. Fill three boxes with an identical selection of items. Each box should contain a selection of fossils, a container of sand, a container of water, a piece of sandstone, a piece of limestone, a container of mud, an insect skeleton (or chicken bone), and several leaves. Place the filled boxes in a straight line at one end of the playing field.
2. Divide the students into three teams. Each team should line up single-file at the opposite end of the room or field. Each team should be facing one of the three boxes.
3. Explain to the students that they are about to participate in a relay race. The teacher will read a clue. Each clue will provide information on a type of rock, a component of a rock, a type of fossil, or a method of fossilization. After listening to the complete clue, the first student in each line will run to their team's box and choose the item described in the clue. Explain that scoring will be based on returning to their team with a correct solution to the clue. Every team with a correct answer will receive two points. The first person back with a correct answer will receive one extra point. A team with an incorrect answer gets one point. The team with the highest cumulative score will be declared the winner.
4. When everyone is ready and understands the rules the teacher will read the first clue. After the clue has been read, the teacher says, "Go" and the first person in each team will race to his or her team's box and will select the correct answer to the clue. Once the selection has been made, the runner races back to his or her team.
5. The teacher now reviews the answers. Beginning with the first team back, the runner shows and explains his or her selection. Note that occasionally there can be more than one correct answer to a clue. Next proceed to the second and third team back, awarding points for speed, correct, and incorrect answers.
6. The first runner now goes to the back of the line and the second person in line becomes the next runner.
7. The teacher will read the second clue card, the teacher says "Go", and the second set of runners race to their box to select their correct answer.
8. Continue in this manner until all students have had at least one chance to select an answer.
9. After each team member has a chance to run and collect a correct item, total the scores. The team with the highest total score will be declared the winner.

## 10. Review instructions:

- The teacher will read a clue card.
- On signal the students will race to their team's box, select the item referred to in the clue, and return to the starting point.
- The teacher will review what each team selected
- Award points after each round of play, awarding points as follows:
  - first to return with correct answer: 3 points
  - all others with correct answer: 2 points
  - any team with an incorrect answer: 1 point



# CRINOID RACE CLUE SHEET

I am the BEST place for fossilization to occur.  
I am often found upon the floor. (*mud*)

I am a rock found throughout the land.  
I am made of tiny grains of sand. (*sandstone*)

To carve out a cave I was the first facet.  
I produced the gas that created the acid. (*leaves*)

I have two shells not quite the same.  
Figure it out, you win this game. (*brachiopod*)

I was alive in an ancient sea.  
Rock was made by crushing me. (*shell*)

In a former life, like a flower I bloomed.  
Now in stone I am entombed. (*crinoid*)

For millions of years I eroded away.  
I am a part of the caprock seen at Mammoth Cave today. (*sand*)

Living on land or in the sea.  
My spiral shell can protect me. (*gastropod*)

I am the stone made in the sea.  
The cave exists inside of me. (*limestone*)

I ebb and flow and land gives way.  
I erode those rocks that are in my way. (*water*)

I'm seen as a fossil of creatures long dead.  
I can be part of a finger, a leg or a head. (*bone*)

I produce O<sub>2</sub> to keep you alive.  
I'm collected, admired, or just pushed aside. (*leaves*)

I'm found in an ocean, a lake, or stream bed.  
I'm best for preserving creatures – from their feet to their head! (*mud*)

I am made from tiny grains.  
I wash away in times of rain. (*sandstone or limestone*)

In Fall I float to the ground, where roads I do pave.  
I release CO<sub>2</sub> — which helps carve out a cave!  
(*leaves*)

The calcium in me made a strong bone.  
Crushed after death I become a tan stone. (*bone or shell*)

Carbon dioxide in me can take its toll.  
Eating away limestone, I produce a hole. (*water*)

Often I'm called the "Lily of the Sea,"  
But the fossil stalk is what's left of me. (*crinoid*)

As the caprock erodes and produces lots of me,  
I'm found on the playground and next to the sea. (*sand*)

I held up a mammoth, a tapir, a sloth.  
I'm found in **your** body wrapped in muscle and cloth.  
(*bone*)

I create acid by releasing a gas.  
That mixes with water to carve a cave path. (*leaves*)

A head, a foot, a spiral shell.  
Close my door and all is well. (*gastropod*)

In days long ago I was much larger and faster,  
But now I'm a fossil that's found in a pasture. (*insect skeleton or bone*)

Eroded from rock, I'm found by the sea.  
Do you think you can you remember the name of me?  
(*sand*)

I have two shells that look almost alike.  
You can hold me. I would never bite! (*brachiopod, pelecypod, bivalve, seashell*)