

AMAZEMENT IN THE BASEMENT: FOSSIL DETECTIVES ACTIVITY

GRADE LEVEL: 3-5



Standards Connection

- SEPs: Asking Questions and Defining Problems, Analyzing and Interpreting Data, Engaging in Argument from Evidence, Constructing Explanations and Designing Solutions
- DCIs: ESS1.B, ESS3.C, LS2.C, LS4.A, LS4.C, LS4.D
- CCCs: Cause and Effect; Scale, Proportion and Quantity; Stability and Change

Objectives

- Students will analyze fossil evidence to learn about ancient organisms and their habitats
- Students will compare prehistoric environments to present-day environments
- Students will discuss how environmental changes affect organisms and their adaptations

Key Vocabulary

- Fossil: The remains or traces of plants and animals that lived a long time ago, like bones or imprints in rocks
- Prehistoric: A long time ago—before people started writing down history
- Evolution: The way plants and animals slowly change over a long time to better survive in their environment
- Adaptation: A special trait or feature that helps a plant or animal survive in its environment, like a turtle's shell for protection
- Habitat: The specific place where an animal or plant lives and gets what it needs to survive, like a pond for a frog
- Environment: The broader surroundings that affect living organisms, including climate, soil, water, and other organisms

Materials

- Large map in exhibit with fossil specimens and where they were collected
- Two worksheet printouts: one with sentence frames and another with open response lines to support different learning approaches.
- Pencils and/or colored pencils

INSTRUCTIONS

We recommend completing the Introduction section in the classroom or as a group before entering the Museum. The Discussion and Wrap-Up section can then be conducted back in the classroom following your field trip.

Introduction (10 minutes)

- Begin by asking students:
 - What do you think fossils are?
 - Have you ever seen a fossil? Where do you think fossils are found?
 - What do you think a fossil can tell us?
 - How do we know what Earth looked like a long time ago?
 - Have you ever found a fossil?
- Explain that in the exhibit they will act as fossil detectives, analyzing fossil evidence to learn about ancient environments.

Exploration (30 minutes)

- Guide students to examine the large map in the Paleontology section of the exhibit, where fossils specimens are displayed.
- Distribute worksheets and pencils to students, they can work individually or in small groups. Make sure there are a mix of the different worksheet options so not all students/groups are looking at the same specimen. Help the students think about what the area looks like today.
- Have students:
 - Find a specimen on the map and draw it.
 - Answer the questions:
 - » In what part of San Diego was your fossil specimen found?
What does this area look like today and what organisms are found there?
 - » How is the current habitat of this area different from where the prehistoric organism would have lived?
 - » What adaptations could help your organism survive in today's environment?
- Have students answer these questions directly on their worksheets, recording their observations and hypotheses.

Discussion and Wrap-Up (10-15 minutes)

- Have students share their findings in pairs or small groups. Encourage students to ask questions about their partner's findings.
- Lead a class discussion using guiding questions:
 - What surprised you about where fossils were found?
 - What do these fossils tell us about Earth's past?
 - How do environmental changes affect living things?
 - Do you think animals today are still adapting to environmental changes?
Why or why not?
- Reinforce the idea that fossils provide clues about past life and how organisms change over time.

Extension Ideas

- Have students research a specific prehistoric animal and present how it adapted to its environment.
- Compare and contrast fossils and modern-day animals to discuss evolutionary connections
 - » Examples: mammoths and Asian elephants, Megalochelys and Galapagos tortoise, megalodon and mako shark

Name _____

Date _____

AMAZEMENT IN THE BASEMENT: FOSSIL DETECTIVES

Directions: Look at the large map in the exhibition and find the specimen listed below, then draw the specimen and answer the questions below.

Fossil Specimen

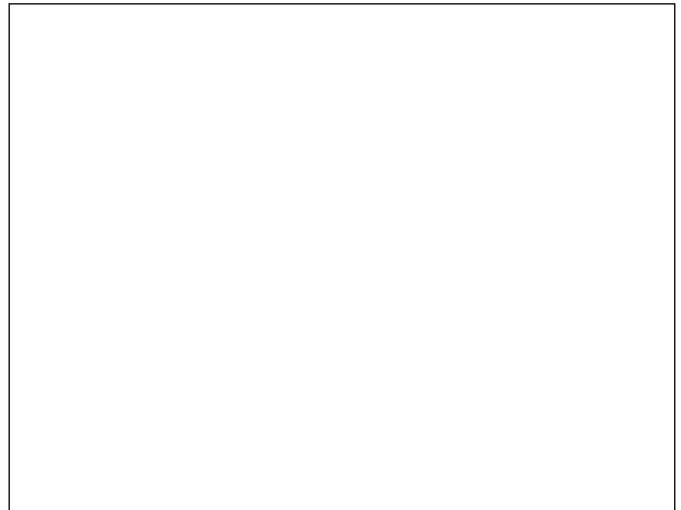
Crab, *Orbitoplax weaveri*

Eocene Epoch (~43 million years old)

Habitat: sandy, shallow marine



Draw the Fossil Specimen



In what part of San Diego was your fossil specimen found? What does this area look like today and what organisms are found there?

My specimen was found in _____ (location). Today, this area has _____ (description of habitat) and you can find _____ (plants/animals) there.

How is the current habitat of this area different from where the prehistoric organism would have lived?

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My specimen would / wouldn't survive in this area if it was alive today.

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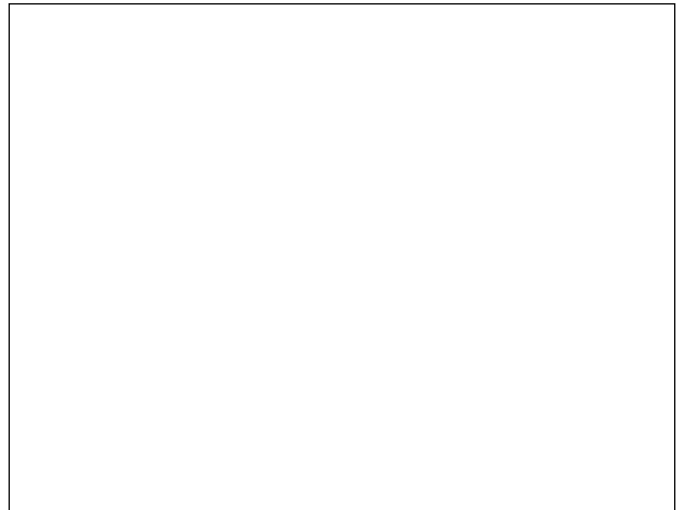
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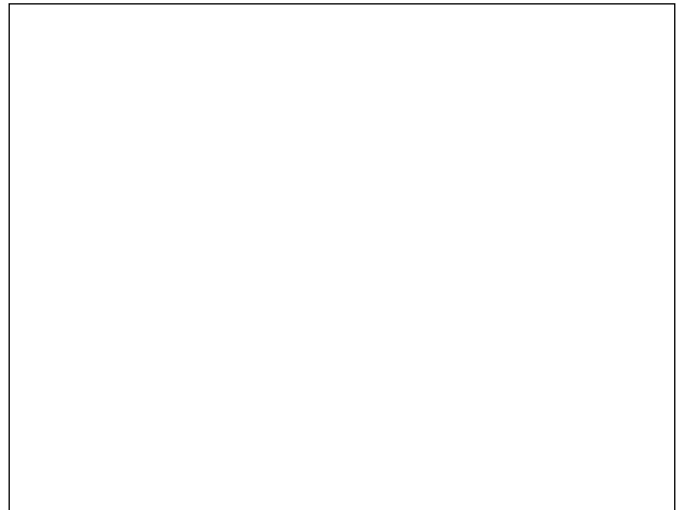
Cinnamon tree leaf, *Cinnamomum* sp.

Eocene Epoch (~45 million years old)

Habitat: wet, dense forest



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Columbian mammoth molar and toe segment, *Mammuthus columbi*

Pleistocene Epoch (~500,000 years old)

Habitat: open grassland/meadow



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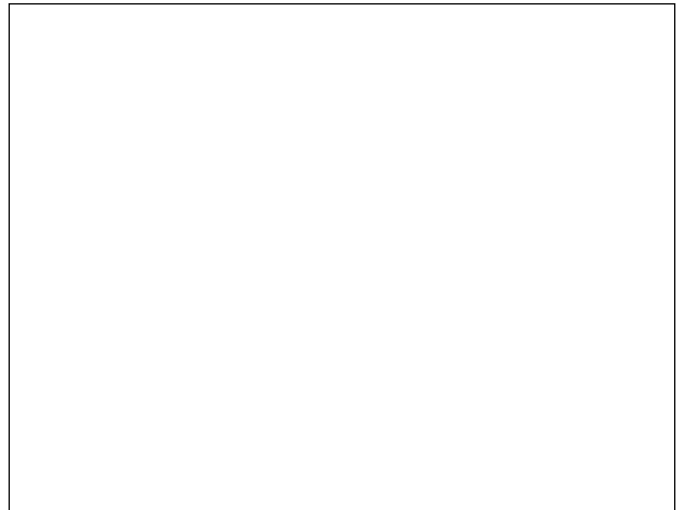
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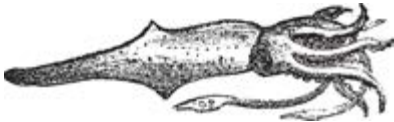
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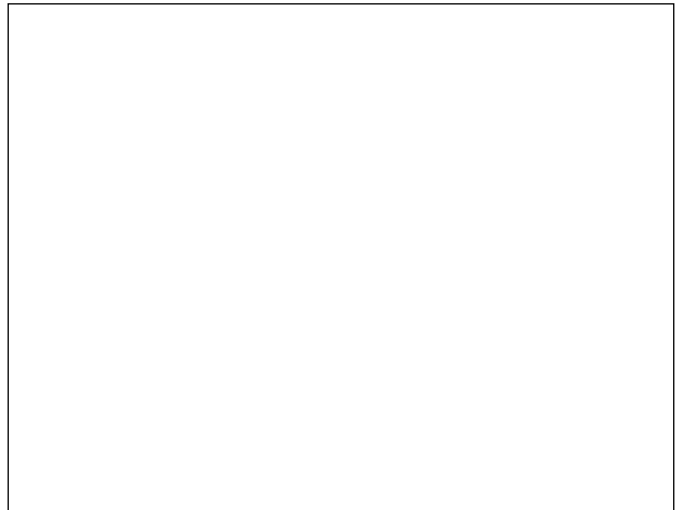
**Belemnite internal "shell",
Cylindroteuthis sp.**

Jurassic Period (~144 million years old)

Habitat: open marine (offshore)



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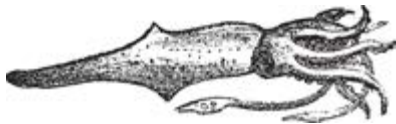
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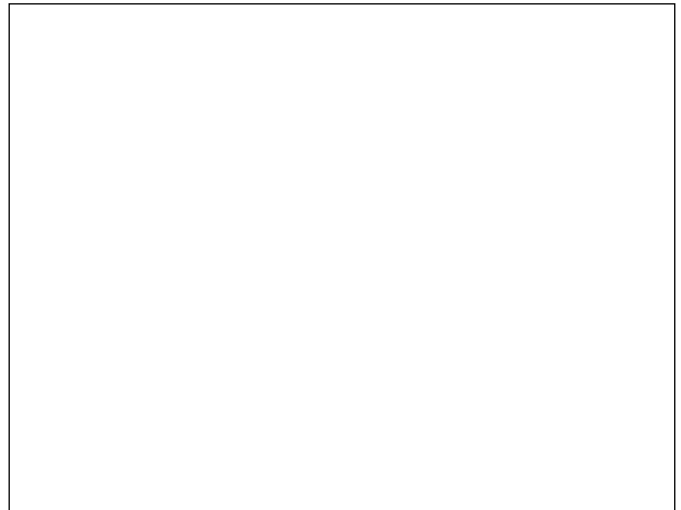
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