Interactive Video Conferencing
CLEVELAND MUSEUM OF NATURAL HISTORY

Exploring Fossils

60-minute Life Science Lesson
Interactive Video Conference Program
Grades: 1-4

TEACHER GUIDE

Exploring Fossils: Clues to the Past

Description

Fossils are clues to past environments. Take a look at specimens from our collections and see if you can identify their long-lost habitat. Discover how fossils are formed and investigate shared characteristics of fossils from a particular environment by utilizing the same paleontology techniques as the experts!

Objectives

- Define fossil and provide examples of different kinds of fossils
- Organize the steps for the formation, preservation and extraction/study of fossils
- Analyze 6 assemblages of fossil plants and animals to determine prehistoric environments
- Determine if any fossil plants or animals from the assemblages compare with present day organisms.
- Identify the geologic time periods associated with the fossils being analyzed

Ohio's Learning Standards

Grade 1: Life Science – Basic Needs of Living Things

- Living things survive only in environments that meet their needs

Grade 1: Math – Measurement and Data

- Measure lengths indirectly and by iterating length units.

Grade 1: ELA – Speaking and Listening SL1.2

- Ask and answer questions about key details in a text read aloud or information presented in various media and other formats (e.g., orally).

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Ohio's Learning Standards, continued

Grade 2: Life Science – Interactions within Habitats

- All organisms alive today result from their ancestors, some of which may be extinct. Not all kinds of organisms that lived in the past are represented by living organisms today.

Grade 2: Math – Measurement and Data

- Measure and estimate lengths in standard units.

Grade 2: ELA – Speaking and Listening SL2.3

- Ask and answer questions about what a speaker says in order to clarify comprehension, gather additional information, or deepen understanding of a topic or issue.

Grade 3: Earth and Space Science – Earth's Resources

- Some of Earth's resources are limited

Grade 3: Mathematics – Geometry

- Reason with shapes and their attributes.
- Represent and interpret data.
- Geometric measurement: understand concepts of area and relate area to multiplication and to addition.
- Geometric measurement: recognize perimeter as an attribute of plane figures and distinguish between linear and area measures.

Grade 3: ELA – Speaking and Listening SL.3.3

- Ask and answer questions about information from a speaker, offering appropriate elaboration and detail.

Next Generation Science Standards

Grade 1: Life Science 1 Structure, Function, and Information Processing

- Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents.

Grade 2: Life Science 4-1 Interdependent Relationships in Ecosystems

- Make observations of plants and animals to compare the diversity of life in different habitats.

Grade 3: Life Science 4 Biological Evolution: Unity and Diversity

- Analyze and interpret data from fossils to provide evidence of the organisms and the environments in which they lived long ago.

Grade 4: Earth and Space Science 1 Earth's Place in the Universe

- Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time

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How You Can Help Make This Virtual Program a Success

- Introduce the vocabulary and additional resources provided below.
- If your students are joining us from a classroom computer, please arrange your room and projection screen so everyone can see us clearly.
- If you and your students are joining us from your homes, we will have an educator monitoring the Chat feature for questions. We request that you or another staff member serve as Co-Host to help monitor students for any inappropriate Chat or camera behavior.
- If you will have a hybrid class (some at school, some joining from home), our educator will monitor the Chat and camera behavior, and we reserve the right to temporarily move any disruptive students to our Waiting Room so we or school staff can correct the undesired behavior.
- If you prefer, we can turn off all cameras and interact solely via the Chat feature.

Vocabulary

cast - a duplicate of an object made from a natural or artificial mold

carbonized – reduced to a thin carbon marking

dinosaur - a prehistoric reptile with upright legs

extinct – animals or plants that don't exist anymore because their needs were not met

fish – an animal that lives in the water, has gills, fins, and scales

fossil - traces or remains of prehistoric life

habitat – the place where organisms find the food, water, and shelter they need in order to live and reproduce

invertebrate - an animal that does not possess a backbone

mold - an impression that preserves the surface appearance of an object (fossil)

paleontologist - a scientist who studies fossils to learn about prehistoric life

permineralized - filled in with minerals

petrified - replaced by minerals

skeleton - the complete set of bones that some animals have inside their bodies

vertebrate - an animal possessing a backbone or spinal column

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Extension Activities

1. Familiarize students with a variety of invertebrates and with the differences between invertebrates and vertebrates. (The most common fossils are those of invertebrate animals, mostly marine animals, such as corals, snails, clams, etc.)
2. Research and construct a geologic time line with the Eras, Periods and length of time of each Period.
3. Look for fossils in gravel driveways or parking areas. Most gravel are composed of a light grey limestone which can often contain fossil shells. Otherwise, northeastern Ohio is not a very good location for finding fossils - they are present but few and far between. Our most spectacular fossils are very difficult to spot in the local rocks, but your students will see them at the Museum.
4. You can make your own molds and casts to illustrate that particular kind of fossil preservation. Use softened clay for the mold. Press an object, such as a shell, into the clay. Remove the shell- the impression in the clay is the mold. Shells also can be pressed into plaster, but be careful to coat the shell lightly with cooking oil and press into the plaster before it gets too hard. Play-dough is another mold material although it often cracks while drying. (Don't be too concerned about that -

   - it lends an air of reality when the mold is slightly imperfect - nature is often that way). A play-dough mold can then be lightly sprayed with cooking oil and filled with plaster to produce a cast. Allow the cast to harden, and then separate it from the mold.
5. Prepare reports about some of the more unusual fossils that have been found, such as animals of the tar pits, animals frozen in Siberian ice, fossils of delicate animals like jellyfish and fossils found in amber.

Online Resources for Teachers and Students

Click the link below to find additional online resources. These websites are recommended by our Museum Educators and provide additional content information.

CMNH Educators regularly review these links for quality. Web addresses often change so please notify us if any links have issues. Please note that aside from our own Museum website, the Museum is not affiliated with and does not endorse these online resources.

Cleveland Museum of Natural History https://cmnh.org/edlinks

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Educator Resource Center (ERC)

Educator Resource Center
CLEVELAND MUSEUM OF NATURAL HISTORY
Celebrating 30 years of supporting science education

The Educator Resource Center is dedicated to providing teachers with the classroom resources and professional development they need to create dynamic, enriching, and inquiry-based experiences for their students.

Contact the ERC at 216-231-2075 for information on individual or school membership and/or to schedule an appointment to borrow materials.

Visit the ERC website for more information on workshops https://www.cmnh.org/educator-workshops

ERC Hours

- By Appointment Only Curbside or Browsing Appointments
- **Wed, Thurs & Fri 2 pm to 5 pm**
- Call or email (erc@cmnh.org) to schedule an appointment
- Closed major holidays & some Professional Development days.

Materials for Loan

With close to 100 dioramas and over 130 thematic teaching kits, our lending library has the materials you need to make science come alive for your students.

If you're interested in additional resources be sure to browse our lending library collection at https://cmnherc.myturn.com/library/

Educator Professional Development

Get connected to trending teaching methods, best practices in science education, and hot topics in current scientific research.

To learn more visit https://www.cmnh.org/learn/educator-resource-center/educator-workshops

Email inquiries to erc@cmnh.org or call 216-231-2075 to speak with an ERC staff member.