



Science Unit: *Fossils*

Lesson #4: *What is a Fossil?*

School Year: 2015/2016

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Grade level: Presented to grade 5-7; appropriate for grades 4-7 with age appropriate modifications

Duration of lesson: 1 hour

Notes: This lesson requires a collection of fossils for the students to examine. See the end notes for suggestions on where to obtain specimens.

Objectives

1. Learn about what is and what is not a fossil
2. Learn about the process of fossilization
3. Examine a collection of real fossils
4. Match fossils to the corresponding organism

Background Information

Most students will have an idea of what fossils are; many will have read books about dinosaurs, or the extinct giant shark Megalodon; or they may have seen reconstructed dinosaur skeletons in a museum. Giving students the opportunity to examine a diverse collection of fossils will expand their idea of fossil to beyond just dinosaur bones and introduce them to a variety of fossil organisms and fossil types. In this activity, students are presented with a collection of real fossils, but the fossils are not identified. Students will need to use what they have learned about fossils and about modern organisms on their Stanley Park field trip to try and identify each fossil.

Vocabulary

Fossil	Remains or traces of a once-living organism preserved in rock
Organism	A living thing
Trace fossil	A fossil trace of an organism (footprint, feces, burrow) rather than a fossil of the organism itself

Materials

- Fossil collection
- Modern items for comparison (i.e. shells, wood, leaves)
- Magnifying glasses
- Matching exercise worksheet (Appendix)
- Organism ID sheets (SRP_Fossils_Lesson 4_IDSheets)



In the Classroom

Introductory Discussion

1. What is a fossil?
 - You can use the slide show here:
https://drive.google.com/open?id=17AXXPBM_gNJl9LImYnEK8uCzSjUUvXajtFfc-g76C08
 - Discuss the definition of a fossil
 - Becoming a fossil is rare - nature usually recycles.
 - Note that hard parts are more likely to be preserved
 - Fossils are usually not the actual organism; the organism has turned to stone (a piece of dinosaur poo is a good illustration of this concept).
 - Fossils might not be part of an organism, but may be something an organism left behind (trace fossils)
2. How do fossils form?
 - Show students a modern shell or piece of wood and fossil equivalent
 - Discuss how the it is mineralized by ground water
3. Explain the matching activity to students
4. Safety guidelines
 - Students need to handle fossils GENTLY.
 - Do not carry them around; only pick up with BOTH hands to examine.

Science Activity/Experiment



Setup

- Label the containers for the fossils in your collection with letters or numbers.
- Each organism gets one letter or number. For example, if you have several types of fossil shark teeth, these would all be labelled with the same letter or number.
- Set the fossils around the room. I like to set them up in order of the geologic age of the organism's first appearance (so bacteria would be first, mammals last).
- Set up a table with 2 copies of each organism ID sheets (these can be left loose rather than stapled together).



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Methods and Instructions:

1. Let the students have 5 minutes to briefly look at all the fossils
2. Then split students into groups of two. Each group gets a matching exercise handout.
3. Tell students to pick an organism ID sheet and try to find the matching fossil; when they find the fossil, write the name of the organism on the line corresponding to that fossil station.
4. Tell students that some fossils may be tricky to identify. They should also keep in mind that the fossils may only represent a part of the organism, or a trace fossil. If a group get stuck, they should move on to another ID sheet.

Closure Discussion

- What is a fossil? What is *not* a fossil? (You may want to show the students some items and discuss (dead leaf, picture of a mummy, a bone, a striped rock, a picture of a hominid fossil).
- Have the students' ideas about fossils changed because of this exercise?
- What are some of the reasons we study fossils?
- If you are not planning on doing the followup lesson "A Walk Through Geologic Time" you may want to discuss some of the important events in life history evidenced by the fossil record, such as the first life, the changing atmosphere, and mass extinctions.

How to Obtain a Classroom Set of Fossils

- University Geology departments - You may be able to borrow fossils from your local university geology department.
- Rock and Mineral, science museum shops - will probably have specimens of some of the more common fossils, and the samples will likely be bigger, more interesting and more representative of local geology than collections available online. (In the Vancouver area, I recommend Amethyst Creations on West 4th avenue.
- Students are typically keenly interested in dinosaur fossils (including coprolites, which are fossilized feces) and megalodon teeth.)
- Gem and Mineral shows
- Local Paleontology clubs
- Online. Online scientific suppliers, such as Boreal, sell mineral and rocks kits

References

1. Alike. 1990. Fossils Tell of Long Ago. Harper-Collins.
2. Bingham, Jane. 2012. Prehistoric World. Usborne.
3. Brown, Cynthia Light, and Brown, Grace. 2016. Explore Fossils! with 25 Great Projects. Nomad Press.
4. Dorling Kindersley. 2013. The Animal Book: a Visual Encyclopedia of Life on Earth. Dorling Kindersley.
5. Hansen, Thor, and Slesnick, Irwin. 2006. Adventures in Paleontology. NSTA Press.
6. <<http://www.k5geosource.org/2activities/1invest/fossils/pg1.html>> What is a Fossil? American Geosciences Institute. [science lesson that introduces fossils]
7. <<http://static.ehe.osu.edu/sites/beyond/penguins/downloads/assessment-probes/apr08-fossil-probe.pdf>> Is it a Fossil? Beyond Penguins and Polar Bears. [fossil assessment probes]



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8. <<http://www.ucmp.berkeley.edu/education/explotime.html>> Explorations Through Time. University of California Museum of Paleontology. [online educational modules for elementary and secondary students].
9. <<http://www.amnh.org/explore/ology/paleontology>> Paleontology: the Big Dig. American Museum of Natural History [online games and activities about paleontology]

Extension of Lesson Plan

1. Students could choose one of the fossils they particularly liked and research it. They could make a short description for the following History of Life lesson.
2. Students could choose one of the orders of life, and do a poster of organisms in that order (like The Animal Book).



Fossil Identification Worksheet

There are 15 fossil stations, one for each of the organisms listed below. Your challenge is to try and identify as many fossils as you can. Use the organism information sheets to help you.

Please handle the fossils gently, as they are unique and fragile!

Ammonite	Crinoid	Sea Urchin
Bony Fish	Dinosaur	Shark
Brachiopod	Ferns	Stromatolite
Conifer	Insect	Trilobite
Coral	Mollusc	Woolly Mammoth

- A. _____ I. _____
- B. _____ J. _____
- C. _____ K. _____
- D. _____ L. _____
- E. _____ M. _____
- F. _____ N. _____
- G. _____ O. _____
- H. _____