



# Discovering Fossils Activity Package

Complement your museum visit and learn about how different fossil types are formed in this comprehensive activity package including a fact sheet, detailed activities, and printable templates.

Curriculum Links .....	1
Suggested Materials .....	2
Vocabulary List.....	3
Fossil Fact Sheet.....	4
Investigating Fossils .....	6
Template A.....	7
Picture Sequencing Different Types of Fossils .....	8
Template B-E .....	9
Fossil Art.....	13
References .....	14

## Curriculum Links

### Grade 7 Science

- Earth and its climate have changed over geological time
- The fossil record provides evidence for changes in biodiversity over geological time

### Grade 8 Science

- Life processes are performed at the cellular level
- Cells are a basic unit of life



## Suggested Materials

- Writing tools (pencil, pen, eraser)
- Laptop or computer for Internet access
- Camera
- Pre-cut picture sequences from Template B-F
- Glue sticks
- 11x17 Poster paper
- Thick leaded pencils or charcoal
- Fine pencils
- Rubber / carving stamps kit (including razors)
  - Note: raw sliced potatoes can serve as an alternative to rubber stamps



## Vocabulary

**Decaying:** The rotting or breaking down of organic matter through the action of fungi, other organisms, or bacteria. Also known as decomposition.

**Fossil:** any preserved evidence of life from a past geological age, such as the remains or impressions of an organism or living thing embedded in stratified rocks. The mineralized remains of a plant or animal.

**Invertebrates:** Animals that do not have a backbone or spine/spinal column. Examples include worms, corals, jellyfish, snails, starfish, and insects.

**Organism:** Any living thing that grows, reproduces, reacts to stimuli, and maintains homeostasis. It consists of bacterium, virus, fungus, protist, animal or plant.

**Prehistoric:** Denoting the period before anyone was around to produce written records or history.

**Preservation:** To keep from decaying, or to keep safe from destruction or injury.

## Fossil Fact Sheet

There are many types of fossils formed by different processes which allow us to learn more about organisms that lived a long time ago.

**Carbon films:** All living things contain carbon as an element. When an organism dies, it is buried in sediment and the materials that make up the organism break down. Soon enough, only the carbon remains. The thin carbon layer can reveal the delicate parts of an organism like the leaves on a plant

**Molds and casts / Impression fossils:** this forms when the hard parts of an organism are buried in sediments like mud, clay, sand, or silt. Over time, the hard parts dissolve entirely, leaving behind a hollow area with the organism's shape, and making an impression where the organism used to be. Over time, the organism disappears, but the impression remains. A cast is formed resulting from this mold. Water carrying dissolved minerals fills the empty spaces of the mold and the sediments and minerals that are left in the mold make a cast. A cast is, therefore, the opposite of its mold

**Petrified fossils / Replacement fossils:** fossils that have been turned into stone. Petrified fossils are formed when minerals replace part or all of an organism and become replicas. Water is filled with dissolved minerals which seep through sediment layers to reach the dead organism. As the organism rots, a hard mineral called silica replaces the organic parts. Once the water evaporates, only the minerals that are hardened are left behind

**Preserved remains:** when organisms get preserved, they are close to their original states. There are 3 main ways an animal can get preserved:

1. Amber
  - An organism, e.g. an insect, gets trapped in a tree's sticky resin and dies. As more resin covers it, the insect is sealed completely inside. This then hardens into amber
2. Tar
  - An organism, e.g. a mammoth, falls trap in a tar pit and dies. The tar penetrates into its bones which prevent the bones from decaying
3. Ice
  - An organism, e.g. a woolly mammoth, dies in a very cold region. Its body becomes frozen into ice, preserving the organism, including the hair

**Trace fossils:** footprint fossils (when an animal steps into silt, mud or sand), leaf impressions, eggs, or anything that leaves behind just a trace of evidence. It reveals the activities of organisms. In the case of a footprint, over time, it is buried in layers of sediment which then transforms into solid rock, preserving a trace of the organism



The following are some great teacher resources to help guide students through their own research about fossils:

- Donnelley, S. (n.d.). Notes on Fossils [PowerPoint Slides]. Retrieved from <https://www.teacherspayteachers.com/Product/Fossil-Notes-735510>
- Harrisonburg Staff. Fossils. (n.d.) [PowerPoint Slides]. Retrieved from staff.harrisonburg.k12.va.us/~esutliff/forms/Fossils\_1334264722.ppt
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- University of Southern Indiana. (n.d.). Fossils [PowerPoint Slides]. Retrieved from [www.usi.edu/science/geology/jdurbin/.../GEOL162-Fossils.../GEOL162-Fossils.ppt](http://www.usi.edu/science/geology/jdurbin/.../GEOL162-Fossils.../GEOL162-Fossils.ppt)



## Investigating Fossils

The goal of this activity is to introduce students to different fossil types and encourage your group to enhance their research skills. This activity can be completed before or after a museum visit.

1. Using the Fossils Fact Sheet provided in this package, explain that there are many types of fossils, each created by different processes.
2. Hand out Template A provided in this package and ask students to complete the table by researching 5 to 7 different fossils found around the world.
  - Note: For a review on credible sources, you may want to have your students read:
    - i. Purdue Owl (2017). Using Research and Evidence. Retrieved from <https://owl.english.purdue.edu/owl/resource/588/02/>
    - ii. University of California Santa Cruz (2017). Evaluate the quality and credibility of your sources. Retrieved from <http://library.ucsc.edu/help/research/evaluate-the-quality-and-credibility-of-your-sources>
  - 3. After students have conducted their own investigations, start a discussion with your group to brainstorm the types of fossils they have discovered in their research.
    - i. What types of information can we learn from fossils?
    - ii. How might this information be important to us today?

**Template A**

Name: \_\_\_\_\_

### Investigating Fossils

Using reliable sources, complete the table below by researching 5 to 7 different fossils found around the world.

	Fossil/ Species	How was it formed?	Where was it found?	Rough sketch
Example:	T-Rex tooth	Mold	Alberta	
A.				
B.				
C.				
D.				
E.				
F.				
G.				

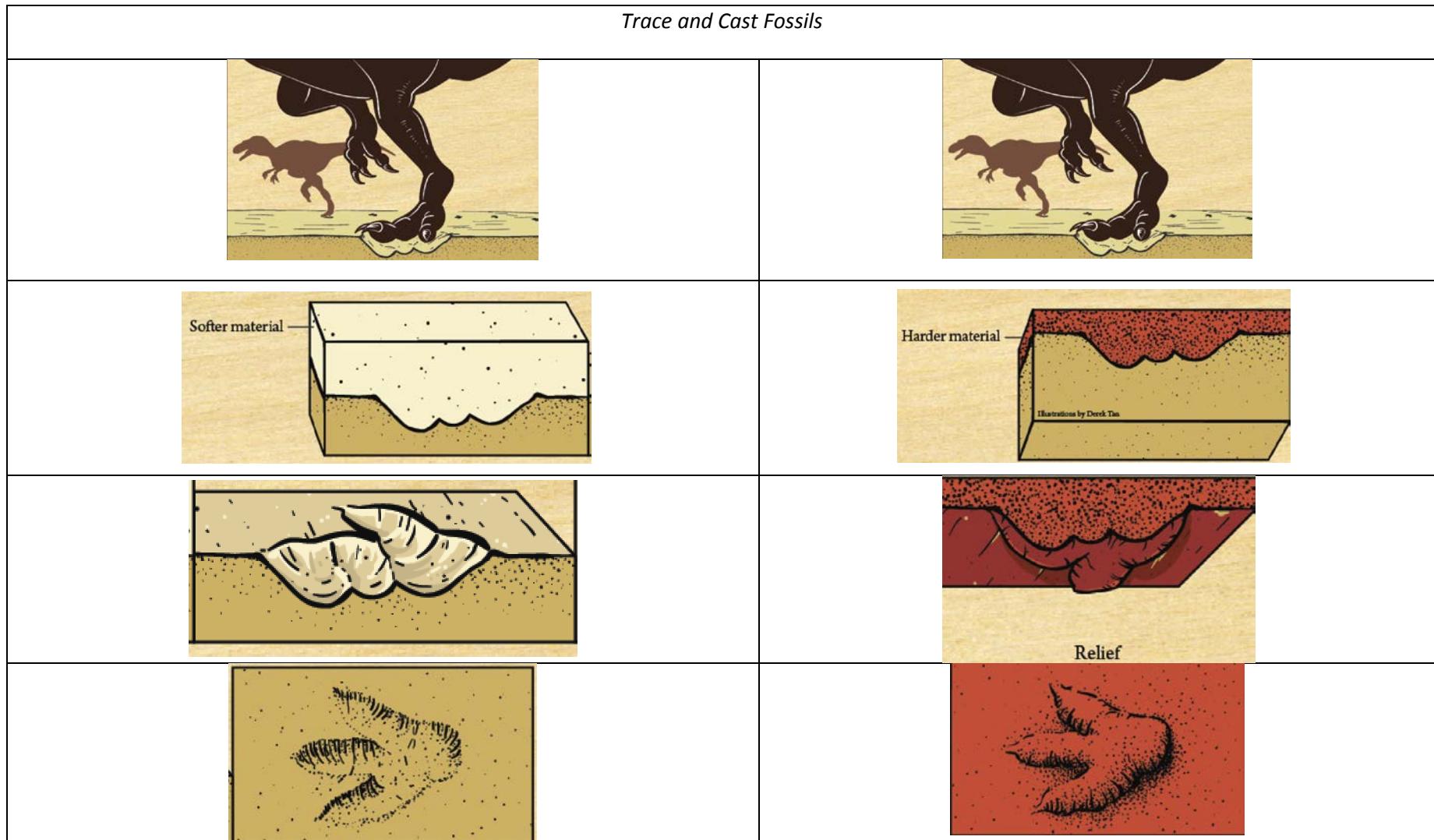


## Picture Sequencing Different Types of Fossils

The goal of this activity is to solidify your group's understanding of fossil types and the processes by which they are formed.

1. Once students have learned about the different types of fossils and the processes by which they are formed, make groups of 3 to 4 students.
2. Print and cut out the images in Template B provided in this package and assign a series of images to each group.
  - a. You may notice that some fossil types are not represented in this activity. Feel free to browse the Internet for images to create your own picture sequences.
3. Students will have to work together in order to
  - a. Identify the type of fossil being represented by the sequence of images
  - b. Organize the images in the correct order to reflect how this type of fossil is formed. Once the order has been determined, ask students to glue the images to the whiteboard or poster paper.
  - c. Each group will present to the class and explain the steps required for the formation of their type of fossil, as well as why it made sense to sequence them in this order.

## Template B



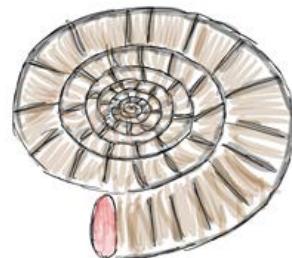
*Images by Derek Tan*

## Template C

### Mold Fossils



Soft tissue is eaten or rots



The hard parts are buried



The hollow shell is filled  
with sediment and a mold  
of the original shell is  
preserved in the sediment

*Photo: Flickr user James St. John used under a  
creative commons license*

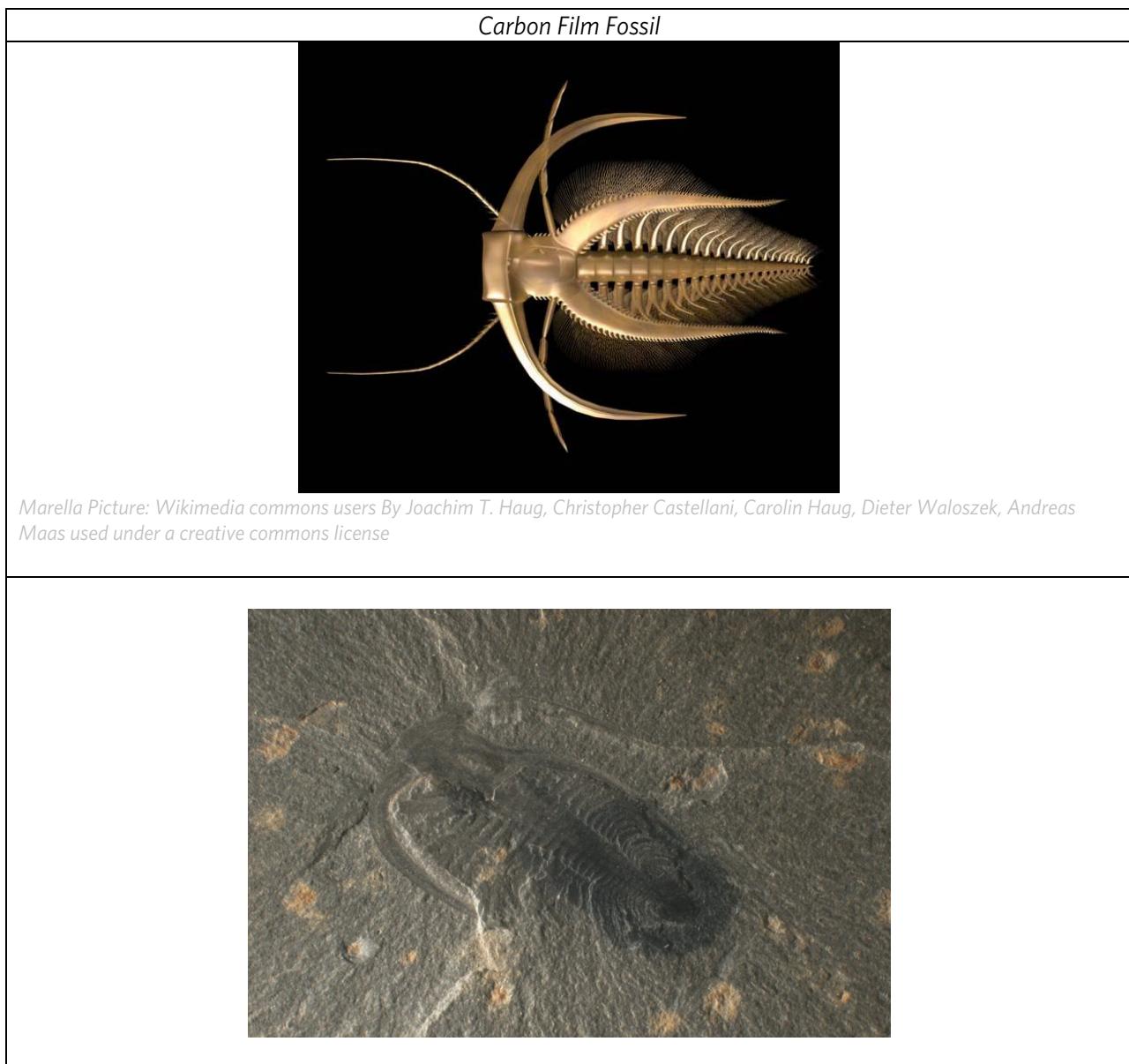


Illustrations by Camille Belanger

## Template D

Preserved Remains		
Before	Cause	Result
		
<p>Photo: Flickr user jasonlumpkin used under a creative commons license.</p>	<p>Photo: Flickr user Bizigura used under a creative commons license.</p>	<p>Photo: Flickr user Oregon State University used under a creative commons license</p>
		
<p>Photo: Flying Puffin - Mammut Uploaded by FunkMonk, CC BY-SA 2.0, <a href="https://commons.wikimedia.org/w/index.php?curid=22770047">https://commons.wikimedia.org/w/index.php?curid=22770047</a></p>	<p>Photo: Flickr user Travis used under a creative commons license.</p>	<p>Photo: WolfmanSF - Own work, CC BY-SA 3.0, <a href="https://commons.wikimedia.org/w/index.php?curid=8538213">https://commons.wikimedia.org/w/index.php?curid=8538213</a></p>
		
<p>Photo: Apotea - Own work, CC BY-SA 3.0, <a href="https://commons.wikimedia.org/w/index.php?curid=25831464">https://commons.wikimedia.org/w/index.php?curid=25831464</a></p>	<p>Photo: Flickr user Mark byzewsky used under a creative commons license</p>	<p>Photo: A.V. Lozhkin - US National Oceanic &amp; Atmospheric Administration (NOAA) <a href="http://www.ncdc.noaa.gov/paleo/partcs/atlas/beringia/images/dima.jpg">http://www.ncdc.noaa.gov/paleo/partcs/atlas/beringia/images/dima.jpg</a>, Public Domain, <a href="https://commons.wikimedia.org/w/index.php?curid=1141030">https://commons.wikimedia.org/w/index.php?curid=1141030</a></p>

## Template E



## Fossil Art

In this activity, students will be using fossils from the museum to create their own fossils, reinforcing their knowledge of fossils and encouraging attention to detail while fostering their artistic abilities.

1. During your museum visit, ask students to identify the fossils they can spot throughout the collections. Students should keep in mind the following questions:
  - a. What types of fossil is this?
  - b. Are any of these fossils similar to the ones I researched in a previous activity?
  - c. How might these fossils differ from the ones I researched in a previous activity?
  - d. Note the diversity of fossils found throughout the museum. Can you tell whether they were plants or animals?
2. Ask students to select one fossil from the museum. They must take a photograph of this fossil; note both its Latin name and common name.
  - a. If the students are not able to take a photo themselves, the teacher can arrange to bring a camera and photograph each student's chosen fossil. Alternatively, students can select images of fossils found on the internet.
3. Print the photographs of each fossil for the students on an 8x11 piece of paper.
4. Ask students to shade in the negative or dark portions (with thick leaded pencils) as well as copy the intricate and detailed designs of the picture (with fine pencils).
5. They will then transfer or press the paper onto rubber or the sliced flat surface of the potato so that the thick lead ink will transfer.
6. A light pencil should be used to mark where the edges of the rubber come into contact with the paper so that more than one attempt can be made in case insufficient lead or charcoal was transferred.
7. The carving knife is used to carve out the negative sections and intricate designs on the rubber or potato. This will give the students a simulation of how fossils create "prints" and how it leaves marks and impressions. Carvings represent where the specimen was or originally located.
8. Ask students to think about the type of fossil that is simulated when carved.
  - a. Either an impression or a replacement type fossil is simulated in this case.

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## Picture Citations

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