



## Barnum Brown: Dinosaur Hunter

The Children's Museum Lesson Plan

**\*\*modified into longer lesson\*\***

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### **Description**

Students will explore the field of paleontology through the eyes of the famous paleontologist Barnum Brown. They will learn about the history behind several dinosaur discoveries, how fossils are found and formed, the differences between different species of dinosaurs, and help them build a timeline of the Mesozoic Era. We will start the lesson with a reading about Barnum Brown and his multiple famous discoveries. After the reading, students will then begin to investigate fossils and how they are found. In the end, students will be searching for “fossils” themselves.

### **Suggested Grade Levels: 3-4**

### **Lesson Objectives**

Science and Engineering Practices

Constructing and performing investigations

Disciplinary Core Ideas

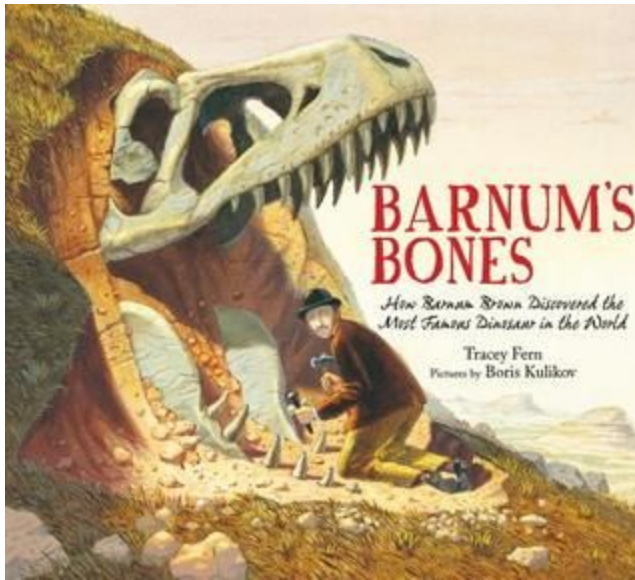
3.ESS.4: Determine how fossils are formed, discovered, layered over time, and used to provide evidence of the organisms and the environments in which they lived long ago.

4.LS.2: Use evidence to support the explanation that a change in the may result in a plant or animal will survive and reproduce, move to a new location, or die.

#### Crosscutting Concept

Cause and Effect: Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships and the mechanisms by which they are mediated is a major activity of science and engineering.

#### Featured Picture Books



Title: *Barnum's Bones: How Barnum Brown Discovered the Most Famous Dinosaur in the World*

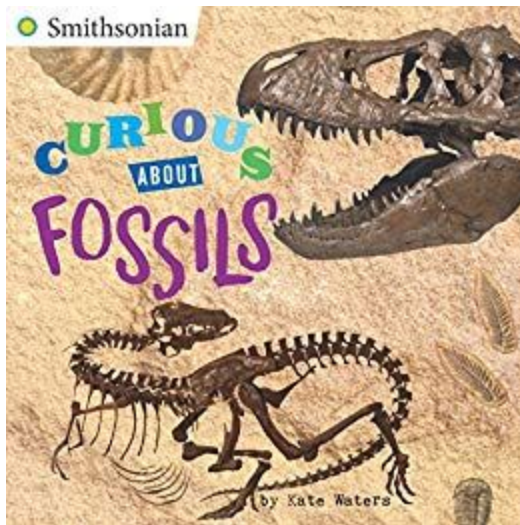
Author: Tracey E. Fern

Publisher: Farrar, Straus, and Giroux

Year: 2012

Genre: Biography

Summary: Named after the greatest showman because his parents hoped he would do something extraordinary, and that is exactly what he did. Barnum Brown discovered perhaps the most famous and beloved dinosaur: the Tyrannosaurus Rex and his name went down in history as a world-renowned paleontologist due to his work with fossils and the American Museum of Natural History.



Title: *Curious About Fossils*

Author: Kate Waters

Publisher: Grosset and Dunlap/Penguin Random House

Year: 2016

Genre: Non-fiction

Summary: What are fossils and what do fossils tell us about the past? How do you find fossils and what technology do you need to find fossils? Read this book to find out.

### **Time Needed**

Day 1 (or 25 minutes): Engage with mystery object, elaborate with *Barnum's Bones*, and explain what fossils are and how they are found. Read an article (<https://kidsdinos.com/what-are-fossils/>) with Harvey Daniels Literature Circles (<https://www.sde.idaho.gov/academic/ela-literacy/files/exemplar/grade-05/civil/literature-circles/Literature-Circles-Roles.pdf>).

Day 2 (or 25 minutes): Explore by building a timeline of the Mesozoic Era and placing various types of dinosaurs on the timeline. Explain various key vocabulary words and discuss the differences between dinosaurs.

Day 3 (or 20 minutes): Watch the video on fossils being formed. <https://www.youtube.com/watch?v=1pcNt2I7j0o> and then elaborate by creating “fossils” by

stamping plastic bones and leaves in play-doh to see what they look like. When stamping the leaves, explore into what environment the dinosaurs must've lived in and what happened to them (did they adapt to their new environment? This question brings the crosscutting concept into play).

Day 4 (this time is up to your discretion): Dinosaur Dig Day!

Day 5 (30-45 minutes): Evaluate your students' learning by having your students create their own paleontologist journal.

### **Materials**

*For Mystery Object*

Bow tie, mystery bag, large sheets of paper for KWL chart

*For Harvey Daniels Literature Circles*

Printed out copies of kidsdino article for each student.

*For Building a Timeline*

Paper to create timeline, markers, printed out pictures of dinosaurs

*For Creating Fossils*

Play-doh, leaves, plastic dinosaur bones, projector, computer (to watch video)

*For Dinosaur Dig*

Paint brushes, plastic dinosaur bones, spoons, plastic trays, dirt or sand or rice, a piece of paper to write the rules for the dinosaur dig

*For Paleontologist Journal*

Paper, pens, rubric, an example of the journal

### **Student Handouts**

What Are Fossils? From KidsDino

How Fossils Are Made from science-teachers.com

### **Background Information for Teachers**

What is the difference between a find and a discovery?

- A find means that the fossils were unearthed, but it was not the first time that fossils from that creature had been seen

- A discovery means that this is the first time any fossils like the ones that were uncovered

Barnum Brown, born in 1873, was a paleontologist who was named after P.T. Barnum. He traveled around the United States and even the world to visit different dig sites. He even traveled on an elephant to a dig site to India! At dig sites, he was known for his unique trademark look of a fur coat and bowtie. In 1897, he was hired by The Museum of Natural History when they had no dinosaur bones, making the hiring of a paleontologist a bit of a challenge. However, by the time of his death in 1963, they had the largest collection of dinosaur bones in the world due to his ability to “smell the bones” which earned him the nickname “Mr. Bones”. And he is best known for discovering the T.Rex in 1902

Definition of fossils from Jurassic Coast Trust: Fossils are the remains or traces of ancient life that have been preserved by natural processes, from spectacular skeletons to tiny sea shells. Imprints, tracks, and trails can also become fossilized, like dinosaur footprints or worm burrows. These are called trace fossils. By studying the remains of life and the traces it left behind we can learn a lot about how animals and plants lived and behaved millions of years ago.

### **Procedure (5E Model)**

Engage: Mystery Object

Hide a bowtie in a mystery bag (a paper bag with a large question mark written on it). Ask your students to guess what is inside the bag. Give them the following clues.

It was worn by a famous paleontologist

He was also known for wearing fur coats at dig sites

The paleontologist is named after P.T. Barnum

It's something people wear when they get dressed up

*Reveal the bowtie*

Would you wear a bowtie to a dig site?

Who do you think the famous paleontologist is?

Create a KWL chart with students about fossils and dinosaurs.

Explain: What are fossils?

Divide your students into random groups of 4-5 and have them pick their roles for Harvey Daniels Literature Circles (make sure this is introduced beforehand and it is not the first time doing this-- if it is, either introduce this before dividing your students up and assign

them their roles instead of letting them pick their roles or do Harvey Daniels Literature Circles as a whole class). Read the article from KidsDino and make sure each student has a printed out copy of the article. Throughout the article, make sure your students are underlining or highlighting information that they think is important. \*\*This can only be done if your students are familiar with underlining and picking out the important information.\*\* Then have each group's discussion director or reporter come up to the front of the class and share one piece of information that came from their discussion on the article.

#### Explore: Timeline of Mesozoic Era

It's extremely difficult for students to visualize just how long ago the Mesozoic Era (when dinosaurs roamed the Earth) was, so having them explore this with creating a timeline is an excellent visual tool. Start off by asking your students to guess how many years ago dinosaurs roamed the Earth. You are most likely going to be getting a lot of various answers ranging from 100 years to 1 billion years ago. This is a quick way to gauge your students' grasp of understanding time periods. After creating the visual, ask your students to find out when their favorite dinosaur lived and place it on the timeline. Then possibly even extend the timeline to when the students were born (if there is space, supplies, and time) to add another personal element to the exploration.

#### Elaborate: Creating Fossils

After exploring and explaining fossils, the next step is elaborating on by creating fossils. Watch the quick youtube video to give a brief visual explanation into fossils. Then create some ground rules for your class (i.e. no throwing play dough, no eating play dough). Then let model how your students will make the fossils by stamping the plastic dinosaur bones into the dough. Have your students observe what the stamps look like and what dinosaur and part of the body they think they're from.

#### Evaluate: Paleontologist Journal

This is an excellent writing evaluation because it requires your students to write out all their observations from the week and various definitions of paleontology terms and be sure to have them include pictures. Make sure they write out exactly what they did each day during the week because good paleontologists have to take very detailed notes. This is an

excellent evaluation because it's very interactive for the kids and is both a summative and formative assessment.

### **Reflection**

When creating the lesson, I was a little nervous to do this lesson by myself because it seemed like a lot of information and organization to conquer alone especially. I was also nervous because I would be meeting the students for the first time and attempting to gain instructional control in a matter of minutes: a tricky feat for even the best teachers, but even more difficult for beginning teachers like me. I wanted to make sure to make this lesson as fun and exciting as possible while also being extremely informational. It's not always easy to make learning fun, but once you start thinking about how to make the learning fun, it comes almost naturally. Therefore, I wanted the students who visited my booth to gain insight into Barnum Brown's life, as I had from reading so many books about him, but I had to do it in a matter of minutes. So I started brainstorming and came up with having the students be their own paleontologist. Dr. Pangan suggested I do a dinosaur dig with real chicken bones because chickens are distant relatives of dinosaurs. However, I ended up getting lucky because The Children's Museum had plastic dinosaur bones that I could borrow for my dinosaur dig, making the task of taking apart a rotisserie chicken and bleaching the bones, a daunting task that I no longer had to face, which was a huge relief. However, I still had another daunting task to face: presenting my information at The Children's Museum.

When I arrived at The Children's Museum, I was ready to hit the ground running. I was excited and nervous and wanted to make sure that when the students who visited my table left with some more information on dinosaurs, paleontology, and a unique man who changed the world of paleontology. The biggest issue when it came to my presentation was the mess that came along with excited kids and their desire to dig to dinosaur bones in rice (which makes a huge mess). However, I realized quickly I had to recollect and strategize to figure out the best way to keep the mess at bay. In addition, I wanted to link Barnum Brown to his namesake P.T. Barnum, however, some of the students were confused and thought that P.T. Barnum (The Greatest Showman) was a paleontologist, which posed another challenge for me. I once again had to rethink this and figure out if there was a better way to continue connecting Barnum Brown

to P.T. Barnum because it related the lesson to something/someone the students already knew. In the end, though, I got in a groove and was able to come up with an effective strategy. I made sure to stand in front of the rice so the students couldn't reach it. I asked the students if they thought real paleontologists would use their hands when looking for bones. I think my absolute favorite part though was when students asked me questions instead of me asking them questions. It made me feel like they were really grasping the concept and interested in learning more about this, which made me smile.

I loved presenting about Barnum Brown at The Children's Museum and seeing the students' faces light up when I told them they were going to dig for dinosaur bones. However, I learned two very important things while at The Children's Museum: if using edible materials, be sure to clearly state that it cannot be eaten and to keep it less messy, explain that paleontologists don't use their hands to dig. Thankfully, I learned these two strategies early on into my presentation time, so I had time to adapt and change what I was going to say to the next group so these problems would not arise again. The wonderful thing though is that my fellow presenters were so willing to lend a hand, like when Jordan took half the group that crowded my table and we flip-flopped or when Joey offered to help me carry materials. I also learned how to manage a group of students independently, but also to value how helpful it is to have a partner in the classroom. I'm glad I did this independently to get the experience, however, next time I might consider doing it with a partner. When I wrote out this lesson plan, I wanted to elongate my original lesson from the Children's Museum so I could possibly even do it in a classroom setting one day (maybe even my own classroom!).