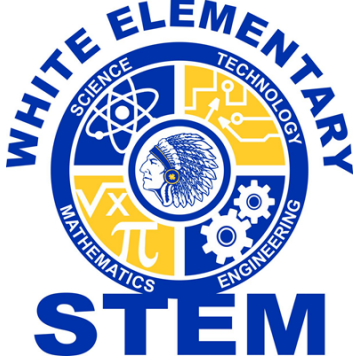


<p><b><u>Lesson Title:</u></b> Fossil Excavation</p>	<p><b><u>Grade Level:</u></b> <u>3<sup>rd</sup> grade</u></p>	
<p><b><u>Essential Question:</u></b> How can I investigate fossils as evidence of organisms that lived long ago? How can I create a bar graph to represent data with several categories? How can I use an informational text to gain knowledge?</p>		
<p><b><u>Standards:</u></b> <b>Science Standards:</b></p> <p>S3E2. Obtain, evaluate, and communicate information on how fossils provide evidence of past organisms.</p> <p><b>Math Standards:</b></p> <p>MGSE3.MD.3 Draw a scaled picture graph and a scaled bar graph to represent a data set with several categories. Solve one- and two-step “how many more” and “how many less” problems using information presented in scaled bar graphs. For example, draw a bar graph in which each square in the bar graph might represent 5 pets.</p> <p><b>Other Content Standards:</b>          ELAGSE3RI3: Describe the relationship between a series of historical events, scientific ideas or concepts, or steps in technical procedures in a text, using language that pertains to time, sequence, and cause/effect          ELAGSE3RI4: Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3 topic or subject area.          ELAGSE3RI7: Use information gained from illustrations (e.g., maps, photographs) and the words in a text to demonstrate understanding of the text (e.g., where, when, why, and how key events occur).          ELAGSE3RI10: By the end of the year, read and comprehend informational texts, including history/social studies, science, and technical texts, at the high end of the grades 2-3 text complexity band independently and proficiently</p>		
<p><b><u>Technology Integration:</u></b></p> <p>Student will access informational videos via schoology and use computers for research.</p>	<p><b><u>Career Connection:</u></b> <b><u>Paleontologist:</u></b> A person who studies fossils in order to learn more about the history of the Earth. The following links will introduce students to Paleontologists  <a href="http://www.kidsdinosaurs.com/paleontology">http://www.kidsdinosaurs.com/paleontology</a>  <a href="http://www.priweb.org/outreach.php?page=edu_prog/publicedprograms/be_a_paleontologist">http://www.priweb.org/outreach.php?page=edu_prog/publicedprograms/be_a_paleontologist</a></p>	
<p><b><u>Engineering Challenge:</u></b></p> <p><b>Design a structure to hold as many “fossils” as possible and lift the structure 3 feet in the air without it breaking.</b></p>	<p><b><u>Materials:</u></b>          Popsicle sticks          Rulers          String/Yarn          Pipe Cleaners          Skewers          Straws          Cups          Glue/Tape          Dowel Rods          Cardboard</p>	

Washers  
Book: Fossils tell of a long time ago

### Lesson Procedures

#### Ask/Engage (day 1)

On the board have the class brainstorm what they think they know about fossils.

■ Read the book: Fossils Tell of Long Ago by Alikei (Summary: What is a fossil? Sometimes its the imprint of an ancient leaf in a rock. Sometimes its a woolly mammoth, frozen for thousands of years in the icy ground. Sometimes its the skeleton of a stegosaurus that has turned to stone. A fossil is anything that has been preserved, one way or another that tells about life on Earth. But you can make a fossil, too--something to be discovered a million years from now--and this book will tell you how.)

■ Go back to the brainstorm and correct any misconceptions and have the students add what they now know about fossils.

■ Share the short video of students finding fossilized shark teeth. Have students listen for the vocabulary that the students use.

<http://www.bing.com/videos/search?q=Paleontologist+Folls+Diging+Up&Form=VQFRVP#view=detail&mid=4A12F0A81B8F94641C214A12F0A81B8F94641C21>

Introduce the challenge to the class.

Challenge:

You are a paleontologist working at Wind Cave National Park and you are excited that your team has discovered some new fossils. There is a problem; the fossils are stuck in a cave crevice that is pretty narrow. Your job is to design a structure that is no more than 6 inches wide and 1 foot tall. Your structure needs to hold as many fossils as possible so it can be lifted out of the crevice in the air 3 feet.

Have students complete the ask/engage part on their student journal.

#### Imagine/ Brainstorm (Day 2)

Criteria:

■ Structure can be no wider than 6 inches

■ Structure can be no taller than 1 foot

■ Structure needs to hold as many washers or weights (fossils) as possible without breaking

■ Structure will be lifted 3 feet

■ Graph the team results on the weight each structure could lift without breaking (create class anchor chart/student data sheet in journal)

Constraints:

■ Use the materials provided

■ Complete the challenge in the allotted time

Have students individually think of a solution to the problem and draw and label their design. Then, have students present their ideas to their groups.

#### Plan/Design (Day 3)

Give student teams time to collaborate and decide on a final design plan.

Make sure students draw and label their final design plan and make a list of needed supplies.

If time allows, have student teams build their design according to their plan.

#### Create/ Test (day 4)

Student teams build their design according to their design plan.

### Evaluate/Improve (Day 5)

Students evaluate their design for success. Teachers will help teams test out their designs lifting washers (fossils) up 3 feet in the air. Remember to record results on the class data sheet and in student journals.

Did it meet the established criteria?

Did their final design match their planned design?

How would students improve their design?