Inference with Fossils - a Third Grade Project Based STEM Lesson

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Project Based STEM Lesson Introduction

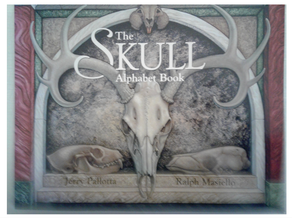
PROJECT STATEMENT: Paleontologists have discovered a new dig site filled with ancient fossils. They are asking students paleontologists to build models and interactive activities using the fossils for a new museum exhibit.

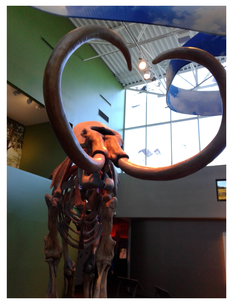
Third grade students will:

- dig for fossils
- research and use technology skills
- create a virtual presentation for a museum exhibit
- use observation and inference skills to examine a fossil
- use math skills to estimate, measure and create line plots
- research using classification keys, websites (myfossil.org) and texts
- create a life size 3D paper model, clay fossil imprint, 3D printed model
- design and create a moving part of the fossil anatomy
- present their museum to other students

Engage

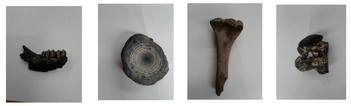
Students will:
use observation skills to describe animal.
use inference skills to name animal..
define parts of a skull.

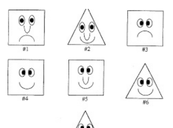


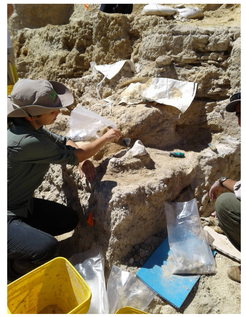


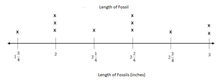
Explore

Students will:
Research a real-life project
Complete a problem statement defining the project that includes constraints..
Investigate scientific tools
Dig for fossils
Observe and describe fossil qualitatively
Measure fossils and complete data charts and line plots
Use a classification key





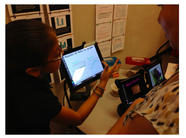


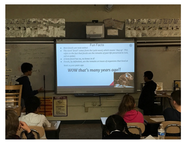


Explain

Students will:

- Use myfossil.org to identify fossil
- Measure lengths
- Infer weight, habitat, predators, prey, size
- Diagram fossil animal
- Make clay imprint of fossil,
- Use 3D printer to create fossil model
- Design and build moving part of animal fossil
- Design and create digitally interactive museum





Elaborate

Present fossil museum

Evaluate

Students will:
Create and present a fossil alphabet song/rap in groups
4 vocab words
4 fossil animals
8 different letters of the alphabet
Reflect on fossil habitat, body size, body weight, adaptations

Citations

University of Florida Paleontology Department

2017 Fossils for Teachers, Fossil Clubs

Google Images

Jerry Pallotta, *The Skull Book*, 2002,Charlesbridge

Standards

LAFS.3.RI.3.7 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).
LAFS.3.SL.1 Comprehension and Collaboration
SC.3.N.1.6 Infer based on observation.
SC.3.L.15.1 Classify animals into major groups (mammals, birds, reptiles, amphibians, fish, arthropods, vertebrates and invertebrates, those having live births and those which lay eggs) according to their physical characteristics and behaviors.
MAFS.3.MD.1.2 Measure and estimate liquid volumes and masses of objects using standard units of grams (g), kilograms (kg), and liters (l). Add, subtract, multiply, or divide to solve one-step word problems involving masses or volumes that are given in the same units
MAFS.3.MD.2.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters.
SC.3.P.8.3 Compare materials and objects according to properties such as size, shape, color, texture, and hardness.
ISTE 1c. Empowered Learner Students use technology to seek feedback that informs and improves their practice and to demonstrate their learning in a variety of ways.
3-PS2-1 Scientific investigations use a variety of methods, tools, and techniques.
3.LS1-1 Science findings are based on recognizing patterns.
3-LS3-1 Analyze and interpret data to make sense of phenomena using logical reasoning.
3-LS3-2 Use evidence to support an explanation.
MAFS.3.MD.2.4 Generate measurement data by measuring lengths using rulers marked with halves and fourths of an inch. Show the data by making a line plot, where the horizontal scale is marked off in appropriate units— whole numbers, halves, or quarters..
3-LS4-3 Construct an argument with evidence.
3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.
3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.
ISTE 6a Students choose the appropriate platforms and tools for meeting the desired objectives of their creation or communication.
ISTE 6b Students create original works or responsibly repurpose or remix digital resources into new creations.
ISTE 6c Students communicate complex ideas clearly and effectively by creating or using a variety of digital objects such as visualizations, models or simulations.
ISTE 6d Students publish or present content that customizes the message and medium for their intended audiences.
ISTE 4b Innovative Designer Students select and use digital tools o plan and manage a design process that considers design constraints and calculated risks.
LAFS.3.L.3.6 Acquire and accurately use conversational, general academic, and domain specific words and phrases as found in grade appropriate texts, including those that signal spatial and temporal relationships (e.g., After dinner that night we went looking for them).
LAFS.3.SL.2.4 Report on a topic or text, tell a story, or recount an experience with appropriate facts and relevant, descriptive details, speaking clearly at an understandable pace.
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