

POWERHOUSE SCIENCE CENTER

3615 Auburn Blvd., Sacramento 95821 (916) 674-5000

Topics

Geology

Paleontology

Astronomy

Grades

K-8

Duration

60 minutes

Vocabulary

Dinosaur: an extinct reptile that lived on Earth millions of years ago

Fossil: any trace of an ancient animal or plant, most often preserved in rock

Paleontologist: a scientist who studies fossils

Pangaea: in early geologic time, a supercontinent that incorporated almost all the land masses on Earth

Supercontinent: a landmass made up of most or all of Earth's land

Rock: an naturally formed solid material that is usually made of minerals

Mineral: a solid substance that occurs naturally in Earth's crust

Expedition Science

Overview

Expedition Science invites visitors on an journey across time and space to explore amazing worlds we cannot easily see. Find out how science has helped us understand things we can't experience directly, like prehistoric life and distant stars and galaxies .

Objectives

Students explore the fields of geology, paleontology, and astronomy and become aware of how they help us understand our planet and beyond.

Students marvel at time, space, and distance as they bring relevance of the past into their present day.

Students leave with an awareness of scales of time, space, and distance.

Teacher Preparation

- Please be on time.
- If you are unavoidably detained, call Powerhouse at (916) 674-5000. If you arrive late, program length will be reduced.
- When you arrive at Powerhouse your group should wait outside while you check in at the front desk. You will be asked for a total head count of students and adults.
- Have students assigned to adult chaperones. Clipboards, pencils and *Science Encounter* worksheets will be handed out and each group will be assigned a location to start their self-guided tour.
- Adult chaperones will help students move through the exhibit and find answers to the *Science Encounter* questions.
- Remind chaperones that there is much more for students to do than just answer the *Science Encounter* questions during your tour time. Have students slow down and explore the exhibit.
- Remind students to use inside voices and not to run in the museum.

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Vocabulary (continued)

Sedimentary rock: rock formed when bits of other rocks, shells or plants or animals are cemented together

Metamorphic rock: rock formed when already existing rock is changed by great heat and pressure

Igneous rock: rock formed when magma or lava gets cool and hard

Geology: the study of the origin, history and structure of Earth

Geologist: a scientist who studies what the Earth is made of and how it was formed

Magma: melted rock below the ground

Lava: melted rock coming out of the ground

Million: a thousand times a thousand

Billion: a million times a thousand (or a thousand times a thousand times a thousand)

Galaxy: a structure made of billions of stars

Expedition Science

Next Generation Science Standards

K/1

Science and Engineering Practices

Planning and Carrying Out Investigations

Analyzing and Interpreting Data

Disciplinary Core Ideas

PS3.B Conservation of Energy and Energy Transfer

Crosscutting Concepts

Patterns

Cause and Effect

Scale, Proportion and Quantity

Structure and Form

Performance Expectations

K-PS3-1 Make observations to determine the effect of sunlight on Earth's surface.

2/3

Science and Engineering Practices

Planning and Carrying Out Investigations

Analyzing and Interpreting Data

Asking Questions and Defining Problems

Constructing Explanations and Designing Solutions

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Vocabulary (continued)

Star: a large, spherical object that makes its own heat and light

Planet: an object that orbits a star that is not itself a star, has enough gravity to form a sphere, and has cleared its orbit of other objects of similar size

Moon: an object that orbits a planet while the planet orbits a star

Atmosphere: a layer of gases around an object in space

Expedition Science

Next Generation Science Standards

2/3 (continued)

Disciplinary Core Ideas

PS1.A Structure and Properties of Matter

PS2.B Types of Interactions

ESS2.A Earth Materials and Systems

PS2.B Types of Interactions

ETS1.A Defining and Delimiting Engineering Problems

ETS1.B Developing Possible Solutions

ETS1.C Optimizing the Design Solution

Crosscutting Concepts

Patterns

Stability and Change

Cause and Effect

Influence of Science, Engineering, and Technology on Society and the Natural World

Performance Expectations

2-PS1-3 Make observations to construct an evidence-based account of how an object made of a small set of pieces can be disassembled and made into a new object.

2-ESS2-1 Use information from several sources to provide evidence that Earth events can occur quickly or slowly.

2-ESS2-2 Develop a model to represent the shapes and kinds of land and bodies of water in an area.

3-PS2-3 Ask questions to determine cause and effect relationships of electric or magnetic interactions between two objects not in contact with each other.

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Expedition Science

Next Generation Science Standards

2/3 (continued)

Performance Expectations (continued)

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.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

Advanced 4+

Science and Engineering Practices

Planning and Carrying Out Investigations

Analyzing and Interpreting Data

Constructing Explanations and Designing Solutions

Engaging in Argument from Evidence

Developing and Using Models

Disciplinary Core Ideas

PS2.B Types of Interactions

ESS1.C The History of Planet Earth

ESS2.B Plate Tectonics and Large-Scale System Interactions

PS1.A Structure and Properties of Matter

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Expedition Science

Next Generation Science Standards

Advanced 4+ (continued)

Disciplinary Core Ideas (continued)

ESS2.B Plate Tectonics and Large-Scale System Interactions

PS1.A Structure of Matter

ESS1.A The Universe and its Stars

Crosscutting Concepts

Patterns

Cause and Effect

Scale, Proportion, and Quantity

Systems and System Models

Performance Expectations

4-ESS1-1 Identify evidence from patterns in rock formations and fossils in rock layers to support an explanation for changes in a landscape over time

4-ESS2-2 Analyze and interpret data from maps to describe patterns of Earth's features.

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.

3-5-ETS1-3 Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

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Expedition Science

Next Generation Science Standards

Advanced 4+ (continued)

Performance Expectations (continued)

MS-PS1-1 Develop models to describe the atomic composition of simple molecules and extended structures.

MS-ESS2-3 Analyze and interpret data on the distribution of fossils and rocks, continental shapes, and seafloor structures to provide evidence of the past plate motions.

5-ESS1-1 Support an argument that the apparent brightness of the Sun and stars is due to their relative distances from the Earth.

Extended Learning Activities

K/1

Make salt dough fossil casts with instructions found on the following site:

<https://www.makelifelovely.com/diy-dinosaur-fossils-with-salt-dough/>

2/3

The US Geological Survey website has great ideas for classroom activities:

<https://education.usgs.gov/lessons/schoolyard/>

Advanced

NASA resources for classroom teachers:

<https://www.nasa.gov/audience/foreducators/5-8/index.html>

Pre/Post Visit Sheets from the National Informal Science Education Network

http://www.nisenet.org/sites/default/files/sunearthuniverse_5_k-12_school_field_trip_guide_rev2-5-19.pdf