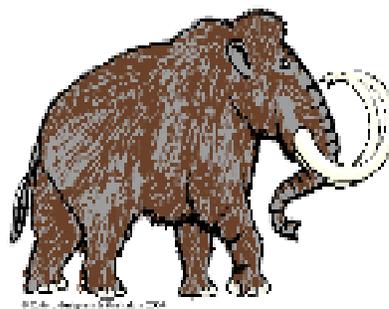


MONTGOMERY COUNTY PUBLIC SCHOOLS
EARTH'S HISTORY AND BIOLOGICAL EVOLUTION

RFP – IS7-400 Smithsonian Exhibit Proposals



BACKGROUND

More than 90 percent of all organisms that have ever lived on Earth are extinct. As new species evolve to fit ever changing ecological niches, older species fade away. But the rate of extinction is far from constant. At least a handful of times in the last 500 million years, 50 to more than 90 percent of all species on Earth have disappeared in a geological blink of the eye.

Though these mass extinctions are deadly events, they open up the planet for new life-forms to emerge. Dinosaurs appeared after one of the biggest mass extinction events on Earth, the Permian-Triassic extinction about 250 million years ago. The most studied mass extinction, between the Cretaceous and Paleogene periods about 65 million years ago, killed off the dinosaurs and made room for mammals to rapidly diversify and evolve.

The causes of these mass extinction events are **unsolved mysteries**, though volcanic eruptions and the impacts of large asteroids or comets are prime suspects in many of the cases. Both would eject tons of debris into the atmosphere, darkening the skies for at least months on end. Starved of sunlight, plants and plant-eating creatures would quickly die. Space rocks and volcanoes could also unleash toxic and heat-trapping gases that—once the dust settled—enable runaway global warming.

Happening Now?

Today, many scientists think the evidence indicates a **sixth mass extinction** is under way. The blame for this one, perhaps the fastest in Earth's history, falls firmly on the shoulders of humans. By the year 2100, human activities such as pollution, land clearing, and overfishing may have driven more than half of the world's marine and land species to extinction.

<http://science.nationalgeographic.com/science/prehistoric-world/mass-extinction/>

REQUEST

The Theory of Evolution is one of the most important theories in science. It explains the current diversity of organisms present on the Earth as well as past organisms that have since gone extinct.

The Smithsonian Museum of Natural History is planning a new exhibit on the extinction of species and the causes of mass extinctions. They are accepting proposals for items to include in the exhibit set to open in July. In order to make the exhibit as engaging and informational as possible for visitors, they are accepting computer interactives, games, graphics, posters, videos, dioramas, props, and other displays. All proposals must meet the design requirements and constraints as listed below:

CRITERIA AND CONSTRAINTS

I. SPECIES INFORMATION

- a. Identification of species common name and/or scientific name
- b. Description of when the organism lived in Earth's history
- c. Description of how the organism evolved
- d. Description of evolutionary relationships to organisms living today (including anatomical and/or embryological similarities)
- e. Description of adaptations the organism had that allowed it to survive in a past environment

II. EXTINCTION INFORMATION

- a. Representation of fossil (picture, diagram, drawing)
- b. Description of type of fossils found
- c. Identification of what caused extinction
- d. Explanation of why the organism was unable to survive extinction event

III. EXHIBIT REQUIREMENTS

- a. Display must include
 - i. All species and extinction information
 - ii. Be scientifically accurate
 - iii. Be interactive and engaging
 - iv. Be of appropriate scientific rigor for general public
- b. Groups may collaborate on research but only individual proposals will be accepted
- c. A feedback forum among scientists will allow for modification or edits of displays prior to final submission to Smithsonian

IV. PRESENTATION OPTIONS

- a. Brochure
- b. Glogster/Website/Online Interactive
- c. Collaboration/Social Media App

V. ARGUMENTATION

- a. Present and receive feedback about your proposal prior to final submission to the museum.

<http://www.sdnhm.org/exhibitions/current-exhibitions/fossil-mysteries/fossil-field-guide-a-z/>

Scientific and Engineering Practices	Requirements of the Project/Problem
<p>Obtaining, Evaluating and Communicating Information</p> <p>Communicate scientific and/or technical information in writing and/or through oral presentations.</p>	<ul style="list-style-type: none">○ Create a proposed Smithsonian Exhibit for an extinct species.○ Evaluate Smithsonian exhibit proposal feedback, and communicate results to others.○ Describe the project/problem and generate ideas to create a design solution.
<p>Constructing Explanations and Designing Solution</p> <p>Construct an explanation using models or representations</p> <p>Construct an explanation that includes qualitative or quantitative relationships between variables that predict(s) and/or describe(s) phenomena.</p> <p>Apply scientific ideas, principles, and/or evidence to construct, revise, and/or use an explanation for real world phenomena, examples, or events.</p>	<ul style="list-style-type: none">○ Create and maintain a portfolio of research on mass extinctions.○ Create and maintain a portfolio of research on an extinct species.○ Explain the process of natural selection and how it led to the evolution and extinction of your species.