LA BREA TAR PITS & MUSEUM

Out of the Box

5th Grade

Duration
Museum Visit

20-30 minutes

Classroom

1 - 2 hours

Locations
La Brea Tar Pits Museum

Project 23

Classroom

Supplies
- Worksheet
- Pencil
- Clipboard (optional)

Standards
NGSS

3-5-ETS1-1, 3-5-ETS1-2, ETS1.A, ETS1.B

S+E Practices

1, 2, 6, 7, 8

CCSS ELA

W.5.8, W.5.9

Vocabulary
Excavation • Engineering • Project 23 • Fossil Deposit • Constraint

Student Work

Concepts

- Engineering problems can have multiple solutions.
- The most successful solutions to engineering problems take both the criteria for success and constraints into account (materials, time, cost, etc.)

Objectives

- Students will examine a real-world design problem at Project 23.
- Students will use information collected at the Museum to design an alternate solution to this same problem.

Outline

1. At the Museum, students will examine Project 23 to discover how the Museum solved a unique engineering problem.
2. Back in the classroom, students will use their research from Project 23 to design an alternate solution. They will need to factor in a variety of constraints, and think about how they would test their design.

Background

What is Project 23?

In 2006, the Los Angeles County Museum of Art (LACMA) began work on a new underground parking garage. During the course of construction, 16 new fossil deposits were discovered, including the semi-articulated, largely complete skeleton of an adult mammoth. How could we get out of the way of the bulldozers but save the fossils? We built large wooden boxes around each deposit, 23 in all. The boxes were moved to their present location immediately north of the Pit 91 complex, and excavation began on "Project 23." In addition to the boxes, there were 327 buckets of fossil material recovered from the LACMA salvage site for paleontologists to clean and sort through. It's going to keep us busy for years!

Where is Project 23 located?

Project 23 is found close to the western end of our campus, near Pit 91 and the Observation Pit. Keep an eye out for the large tree boxes and tarps. You can also find it on our Field Trip Guide.

Pre-Visit

Review the idea that real-world problems can be solved with engineering solutions. Engineered designs can improve our lives in a multitude of ways. Engineering requires creativity, and the ultimate project goals and constraints must always be kept in mind. Review the following terms with your students:

Project goals: What are you hoping to achieve with this project? Note that a project may have multiple goals and that an engineer may need to prioritize certain goals over others.

Constraints: What are the limitations of this project? Budget, time, materials, and space are all examples of constraints.

Museum Visit

Students will visit Project 23 during their field trip. Using information from the excavation site, students will identify:

1. What challenges did the Museum face when we discovered Project 23?
2. How did we solve those challenges? What was the solution we found?
3. What were our main goals when deciding to move the fossil deposits?
4. Can you think of any constraints on this project?

In the Classroom

Students will work either alone or in groups to design an alternate solution for the “problem” of needing to move 16 fossil deposits to a new location.

1. How did you address the challenges you found at the Museum?
2. What changes did you make to the Museum’s solution?
3. How does your new solution consider the constraints of this project?

Students should use additional paper to draw their designs.

At Project 23

Use information from the Museum and the excavation site Project 23 to consider...

What challenges did the Museum face when we discovered Project 23?

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What was the solution we found?

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What were our main goals when deciding to move the fossil deposits?

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At Project 23

Can you think of any constraints on this project?
Budget, time, materials, and space are all examples of constraints.

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Back in the Classroom

Imagine that you are an engineer confronted with the "problem" of moving 16 deposits of Ice Age fossils to a new location. Design an alternate solution using additional sheets of paper, and answer:

How did you address the challenges you found at the Museum?

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What changes did you make to the Museum's solution?

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How does your new design consider the constraints of this project?

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(use additional paper if necessary)