

Design Challenge: Echo Base Bobsleds

Can you design a bobsled to race down the icy slopes of Hoth as quickly or as slowly as possible?

Goal:

Try to build a miniature bobsled to be either the fastest or the slowest.

Time:

20 Minutes for the activity, 10 minutes for setup and cleanup.

Materials:

- Bobsled track
- Plastic pipette trays
- Strips of fabric
- Duct-tape covered, dead AA batteries
- Pipe cleaners
- Plastic straws
- Binder clips

Design Cycle!

1 Ask/Imagine/Plan

Explore the materials available. Which materials are the heaviest or lightest? Which materials slide well? Test some of the sample materials. How do they perform? Brainstorm different combinations of materials you could use to design your bobsled. Decide whether you will build a fast bobsled or a slow bobsled. Think of many different possible solutions and discuss them with your team. Pick an idea you would like to design and test.

2 Create

Determine which materials you will use. Will you change the surface material or the weight? How will you attach all of your components to the bobsled chassis? Construct your designs with the materials you have selected.

3 Test

Ask design challenges staff to help you test your designs! Be sure to test multiple designs and keep track of the results. Try changing just one thing on your design and testing again.

4 Improve

Which design worked best? What did you learn from your tests? How could you make an even faster or slower bobsled? Plan your new design like before and then ask design challenges staff to help you test it. Is your new design faster? slower? Why?

Echo Base Bobsleds: Facilitation

Talking Points

- What is a bobsled?
- What factors influence how fast your bobsled travels down the track?
- Would your bobsled go faster if a lot or a little of the bobsled touched the track?
- Would more weight increase or decrease the speed of your bobsled?
- Would the position of the weight affect the speed of your bobsled?
- What is friction and what influence does it have on your bobsled?
- What is the Engineering Design process?
- Why is it important to make one modification to your bobsled at a time?
- What type of energy does the bobsled have when it is at the top of the track, half way down the track and at the bottom of the track?
- Do you think that your bobsled would travel more quickly or slowly on a straight or hilly track?

