SHIPWRECKED!

Duration: 20 minutes
Institution: Museum of Science, Boston
Skill level/Age Level: K-8
Group size: 5-30

INTRODUCTION

Can you and your class or group survive on a deserted island? Working in small teams, students design, build, and test solutions to survive on a deserted island.

KEY CONCEPTS AND/OR SUBJECT AREA

Repurposing materials, engineering design process

MATERIALS AND TOOLS

Student Worksheet listing suggested items to try and build

Wooden Crate (purchased from AC Moore or Michaels, could use a bag instead)

Assorted Materials (whatever you have around – below is what we use but feel free to substitute items. Most were purchased at the $1 store)

Shower Curtain
Scrap of fabric
Plastic Sand Toys
Piece of aluminum foil
Ice cube tray
Bungee cords
Lengths of rope
Fresnel lens
Clothes pins
Coconuts
"Map" of island (hand-drawn, treasure-like map)

HOW TO OR STEP-BY-STEP

Set Up
Give student teams of 3-5 a crate of materials and a space to work. A table can be helpful, but not necessary.

1. Ask/Imagine/Plan
Divide students into teams of between three and five and explain the shipwrecked scenario. Give each team one crate of materials to work with. Ask each team to examine the contents of their crate, the map of the island, and the list of items they need to build in order to survive. Students should brainstorm ideas to create these items using only the materials in their crate and any natural resources they can find on the island. Students should not start building until after the planning phase.

2. Create
Using the materials provided and imagining any natural resources, students should build the items they would need to survive if they were shipwrecked on a deserted island. Have students present some or all of their designs to the class or Design Challenges staff and get feedback on their designs. This is a design review, a critical step for professional engineers.

3. Improve
Students should redesign their items using feedback from the design review. As students redesign their items, encourage them to make appropriate changes to the sketches of the models so that the sketches reflect their new designs. Upon completing their final designs, ask students to reflect on what materials and designs worked best for achieving their goals. Ask them to then consider what a next step would be in their design process. How did they come up with ideas, particularly those that were harder for them?

FACILITATION TIPS

• The workspace should have structures on which to build. For example, benches or desks can be used in place of trees to hold up a tarp.

• The materials list provided is merely a suggested list. If other materials seem to suit this activity, feel free to adjust the list accordingly. Try to consider materials that don't have an obvious use, so students will be forced to think outside the box. Make sure students have at least one solution for each type of item they are to design.

• To shorten this activity, reduce the number of supplies that students need to build or omit the design review presentations.

• Be sure that students understand the limitations of living on a deserted island and plan their designs accordingly. For example, they can't drink ocean water and cell phones won't work.

• Design reviews emphasize the importance of communicating ideas in science and technology.

MATERIALS SOURCES

Craft stores (Michael's, AC Moore), $1 Stores

KEYWORDS

Repurposing materials, engineering design, outdoors, indoors, young learners