

DESIGN CHALLENGE: SHIPWRECKED

SHIPWRECKED:

Can you design, build and test the supplies you would need to survive on a deserted island?

GOAL: Working in small teams, students design, build and test solutions to survive on a deserted island.

TIME: 30 minutes for activity plus 5 minutes for set up and 5 minutes for clean up

Materials (per Team):

Wooden Crate Map of the Island
Shower Curtain
Small Fleece Blanket
Plastic Sand Toy (e.g., a rake)
Camping Clothesline
Two Feet of Aluminum Foil
Pipette Holders
Ice Tray
Plastic Tie Rack
Cardboard Tube
Bungee Cords
Rope (3 lengths)
Fresnel Lens
Scrap Paper

DIRECTIONS

- 1 ASK:** Divide students into small design teams of 3 or 5 students and explain the shipwrecked scenario. Give each team one design challenge worksheet, scrap paper, and one crate of materials with which to work.
- 2 IMAGINE:** Ask each team to examine the contents of their crate, the map of the island and the list of items they need to build. Students should brainstorm ideas to create the survival 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 plan phase.
- 3 PLAN:** Students should sketch their designs on the scrap paper. Older students should make sure they do not use a material more than once and that they have a design for each item on the list. If students are stuck for ideas, suggest that they either examine their materials and brainstorm ways to use them, or imagine solutions and then see which of their materials might let them implement those solutions.

SHIPWRECKED: DIRECTIONS CONTINUED

- 4 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 and get feedback on their designs. This is a design review, a critical step for professional engineers.
- 5 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 sketch of their model 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 work space 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 be imaginative. 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.