

Lab #8: *Marine Engineering* (Chapter 6)

INTRODUCTION:

The objective of this lab is to illustrate to the student the effective engineering design of Noah's Ark.

MATERIALS

- Various Styrofoam shapes, such as a sphere, cylinder, cube, 3D rectangle, cone, and pyramid (e.g., [AmazonSmile: Craft Foam Shapes for DIY Crafts \(White, 6 Pieces\) : Arts, Crafts & Sewing](#))
- Lego characters and/or small toy animals
- Box cutter or pocket knife
- Hot tub/pool spa with jets (ideal); pool/bathtub if necessary

METHODS

1. Cut various shapes into blocks of Styrofoam (or purchase them already cut). Ensure that one of the cut shapes is a long 3D rectangle wider than it is tall, like the Ark.
2. Use a box cutter/pocket knife to hollow out "seats" on the top of the various shapes for the characters to sit in.
3. Load the characters/animals onboard each of the shapes in turn and "launch" the shapes (i.e., vessels) in a hot tub with jets on (representing rough sea conditions and the "fountains of the deep" erupting below the water).
4. Assess/record how the various shapes would withstand Flood-like conditions. Rate each shape from 1 to 3 on each of the following questions (1 meaning that the shape is extremely ill-suited for Flood conditions in that way; 3 meaning that the shape would be very well-suited for Flood conditions in that way).
 - Is the vessel likely to capsize?
 - How would it respond to heavy rain?
 - Would the passengers likely be tossed about and killed?
 - Would the shape of the vessel be conducive to holding enough passengers?
 - How difficult would it be to build a vessel of that shape using wood?
 - How well would the vessel shape withstand impacts from debris?



RESULTS/DISCUSSION

1. Make a chart listing the shapes along the left and the above questions heading six columns. Rate how well each shape performs in each of the areas assessed in the Methods section. Add a 7th column that records the sum total of all of the column values for each shape. Circle the shape(s) that performed the best.
2. Discuss the pros and cons of each shaped vessel, highlighting which shaped vessel(s) appears to be best suited to Flood conditions.

