

Math 107

Growth Project

Perhaps you have seen toys like this in the store:



Here are the claims made in the advertisement concerning this product:

- Assorted Water Growing Sensory 24 Sea Creatures, Animals in a sheet
- After placing the dry animal figures in a pan of water, they expand to six times their original size. Soak 48 - 72 hours for full size
- Amazing Sensory, Learning Toys for Children - Boys and Girls
- Growing Sea Life Characters. Grow an underwater zoo with these sea life characters! Soak these oceanic foam animals under water to increase their size in hours. In a glass or bowl, you can make an aquarium by watching these turtles, fish and more stretch and swell before your eyes! These swimmers make fun giveaways in treat bags at tropical-themed birthday parties! ---

So, our job in this project is to test the claim that the dry sea creatures expand 6 times their original size. Here what you will do

- 1) You will receive a plastic foam animal from me.
- 2) Do the experiment long before it is due – you need about 72 hours for these to expand (if they do)
- 3) Decide how you would interpret the meaning of “After placing the dry animal figures in a pan of water, they expand to six times their original size”. Does this mean length, area volume ? What percent increase is the claim “expand 6 times their original size”
- 4) Now run an experiment – For the foam animal measure the length, area and volume of the original figure. Now place it in water (use hot or warm water) and let it grow to full size (this can take a while) Once it has reached full size measure it again (all three units). I will give some insights on how to measure.
- 5) Finally calculate the percentage change of the size of the final animal to the original animal. How do these calculations match up with the claim “After placing the dry animal figures in a pan of water, they expand to six times their original size”?

(over)

Special instructions you need to consider:

- a) Make sure you take pictures (with your phone or otherwise) of your measurement of the original figures and the final figures. Use a ruler to show the measurement (or draw a rectangle around the figure for area or a rectangular solid for volume. This is necessary to provide proof (or disproof) of the claim
- b) Write a report of your findings like you did in the first project. However, this time you are to assume you have been hired by the company to check the claim that "After placing the dry animal figures in a pan of water, they expand to six times their original size". Use the pictures as "evidence" and show all calculations in your report. Do customers have a valid complaint of "false advertising" for the products claim?
- c) When defending the company, be sure to calculate the relative error and the absolute error as compared to the 600%. Here is an example.
<http://www.wikihow.com/Calculate-Relative-Error>
- d) If your final measurements were off by 10% (over or under?) in each direction, how much would relative error would that create? How precise do you think your measurements were?