Math Summative Assessment - 2010

Objective:

If every available (and suitable) space in a French or Spanish galleon was filled up, what is the maximum amount of sugar (by weight or by volume) which would fit into the galleon? Please justify your answer completely.

Guiding Question:

How has imperialism affected our society?

Area of Interaction:

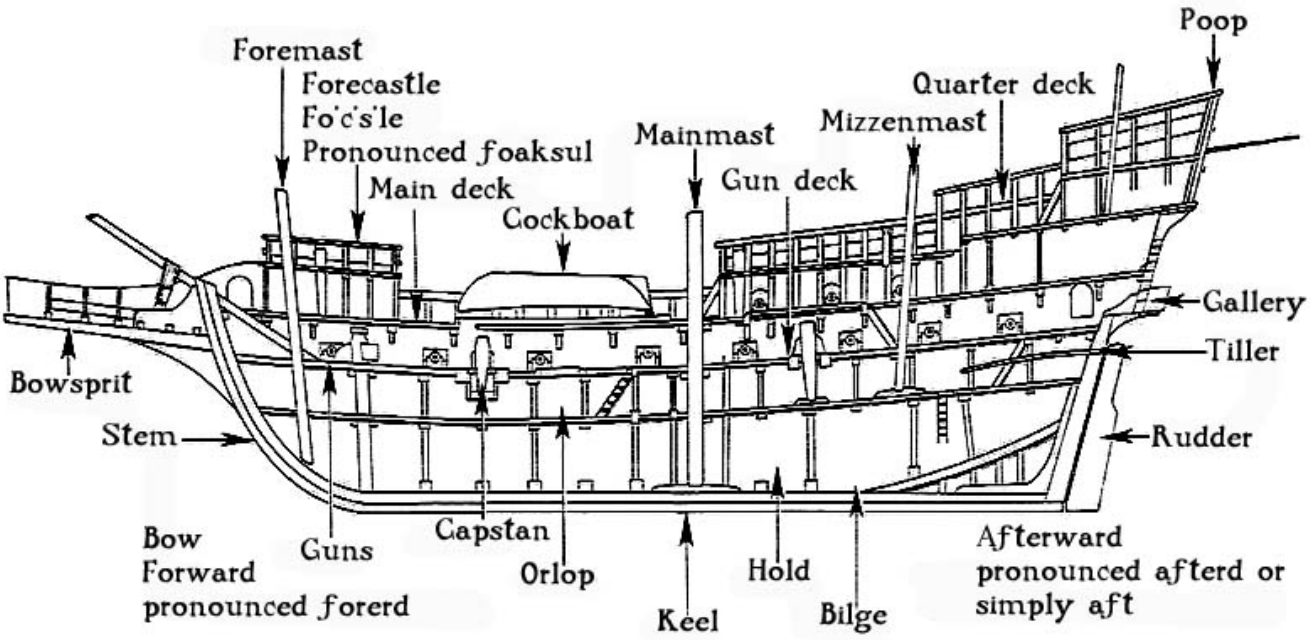
Community and Service
Approaches to Learning

Task:

Before we can answer this question, there are two sub-questions we need to be able to answer. What is the approximate volume of the galleon(to as much accuracy as we are able to find)?
How much space does sugar take up? This will allow us to determine the total volume of trade that occurred during the days of early colonialism and imperialism.

You may find yourself needing to use trigonometry, volume, statistics, algebra, and other areas of mathematics we have learned this year in this project. Remember that I am looking for as accurate an answer as you can give.

Sample galleon:



Guiding questions:

Use these questions to guide your investigation.

1. What types of shapes does the storage space of a galleon contain? How can we find the volume of these shapes? What sorts of considerations should we make when thinking about the transport of sugar (which for example is easily ruined if it gets wet)?

2. Imagine you are a French or Spanish merchant involved in the distribution of sugar. You typically sell sugar by weight. How much space does 1 kilogram of sugar need? How is it transported? What is the typical shape of the container that sugar would be transported in?

3. What assumptions do you need to make? Be as clear as possible when you make an assumption and include a justification for this assumption.

Expectations:

Your project will take the form of a typed document (Microsoft Word, Google Document, Open Office, etc...), which you will email to me. It should include a title page, an introduction, a procedure, calculations, diagrams, a conclusion, and an evaluation. Please use resources we have shared before in class to guide you in the creation of this document.

Evaluation:

<u>Criterion A: Knowledge and understanding</u>

0 - The student does not reach a standard described by any of the descriptors given below.

1 or 2 - The student attempts to make deductions when solving simple problems in familiar contexts.

3 or 4 - The student sometimes makes appropriate deductions when solving simple and more-complex problems in familiar contexts.

5 or 6 - The student generally makes appropriate deductions when solving challenging problems in a variety of familiar contexts.

7 or 8 - The student consistently makes appropriate deductions when solving challenging problems in a variety of contexts including unfamiliar situations.

Criterion C - Communication in Mathematics

0 - The student does not reach a standard described by any of the descriptors given below.

1 or 2 - The student shows basic use of mathematical language and/or forms of mathematical representation. The lines of reasoning are difficult to follow.

3 or 4 - The student shows sufficient use of mathematical language and forms of mathematical representation. The lines of reasoning are clear though not always logical or complete.
The student moves between different forms of representation with some success.

5 or 6 - The student shows good use of mathematical language and forms of mathematical representation. The lines of reasoning are concise, logical and complete. The student moves effectively between different forms of representation.

Criterion D - Reflection in Mathematics

0 - The student does not reach a standard described by any of the descriptors given below.

1 or 2 - The student attempts to explain whether his or her results make sense in the context of the problem. The student attempts to describe the importance of his or her findings in connection to real life.

3 or 4 - The student correctly but briefly explains whether his or her results make sense in the context of the problem and describes the importance of his or her findings in connection to real life. The student attempts to justify the degree of accuracy of his or her results where appropriate.

5 or 6 - The student critically explains whether his or her results make sense in

the context of the problem and provides a detailed explanation of the importance of his or her findings in connection to real life. The student justifies the degree of accuracy of his or her results where appropriate. The student suggests improvements to the method when necessary.