



Rose Island Lighthouse Foundation Education Program – Lesson Plans

Grade Level: 3-5

Lesson Topic: Cistern Calculations

Length: 10 minutes on the island, One class period

RI Standard of Learning: Mathematics (Computation, Number Sense, Geometry)

Learning Objective: Students will complete math problems regarding parameters of the cistern in the basement of the lighthouse. They will learn the formulas for volume of a rectangle, the relationship between pints and gallons and pounds. Students will compute formulas with and without paper.

Materials: Pencil and paper, clip board, cistern, two 8-oz cups, four 1-quart containers, two 1-pint cartons, a one-gallon jug filled with water, optional funnel for easy pouring, lab sheet

Vocabulary: cistern, pint, pound, calculate, capacity, gallon, quart, ounce

Procedure:

On Rose Island: The tour guide will show the group of students the cistern in the basement. After explaining how the cistern works and what its function is, the tour guide will begin to quiz the students on the dimensions of the cistern. The cistern holds up to 3,000 gallons. There will be several questions regarding how long it will take to use up that amount of water. There will also be questions regarding the weight of the water in a fully loaded cistern. The tour guide will inform the students that one-pint is equal to one pound, there are 2 pints to a quart, and there are 4 quarts in a gallon. They will be asked to do some volume calculations using the diameters of the cistern (length x width x height). Students may use paper to solve, but should try to solve in their heads first.

In the Classroom:

- Introduction: Ask students to recall the math they did to calculate the volume of the cistern in the basement of the lighthouse. Ask them to recall the principles they learned regarding the equivalence between pints and gallons. Divide class into small groups and distribute a lab sheet to each student.
- Development: Instruct the students to follow the instructions on the lab sheet. Have them print their answers on the sheet
- Closure: Have them turn in the sheets with their answers. Answer the following questions as a group: How many cups are there in 1 quart? How many pints are there in 1 gallon? How many cups are there in 4 pints?

Evaluation: Make sure that the students all grasp the concept of liquid volume units. Ask them where they have seen these units before around the house. Grade their lab sheets.

References:

<http://www.iit.edu/~smile/ma9002.html> - lesson plan used without permission, lots of other great lesson plans as well.



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Conversions You May Need:

- 1 gal = 4 qts
- 1 qt = 2 pts
- 1 pt = 16 oz
- 16 oz = 1 lb
- 1 cup = 8 fl.oz.

Answers to Lab Worksheet:

1. 4
2. 2
3. 2
4. 16
5. 1 lb.
6. Students weight x 2 = # of cups



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Name _____

Lab Worksheet – Capacity

1. Pour 4 quarts from the gallon.
Q. How many quarts make a gallon?
A.

2. Pour 1 quart into the pint containers.
Q. How many pints make a quart?
A.

3. Pour 1 pint into the cups.
Q. How many cups make a pint?
A.

4. Q. How many ounces are in a pint?
A.

5. Q. How much does a pint weigh?
A.

6. Record your body weight.
Q. How many cups do you equal?
A.