Meet Mr. Gallon

SOL: Math 4.12 (a,b)
The student will estimate and measure liquid volume, using actual measuring devices and using metric and U.S. Customary units, including cups, pints, quarts, gallons, milliliters, and liters; and identify equivalent measurements between units within the U.S. customary system (cups, pints, quarts, and gallons) and between units within the metric system (milliliters and liters).

Materials:
- Mr. Gallon body parts (one set per student)
- Construction Paper
- Classroom Mr. Gallon
- 6 sets of laminated Mr. Gallon parts w/Velcro
- 6 sets of common milk/juice containers in each of the measures (cup, pint, quart, gallon) w/velcro placed in 6 plastic dishpans
- Vocabulary Sheet
- Book: *Room for Ripley* by Stuart J. Murphy

Goals:

- Students will associate the names of the customary units in the customary system with containers of each unit size.
- Students will identify everyday real world representations of items measured in customary units.
- Students will convert units within the customary system.

Procedure:

Background Information: This lesson is presented as the first lesson in a unit about liquid measurement. Students will have recently studied linear measurement and will have had exposure to standard versus non-standard units.

This lesson may require two class periods.

Class Starter: Read *Room For Ripley*.

***Before Reading*:** Show students the cover for *Room for Ripley* and ask them to predict what they think the story is going to be about. Find out if any of the students have fish for pets at home. If so, ask them about their fish tank. How big? How much water is in the tank? What types of living things are in the tank? How much food does the fish eat? Do they have to do anything special to the water to keep it clean?

After reading: Ask students how they would find out how to set up an aquarium. Explain that we are going to learn how to use liquid measurement to create an aquatic ecosystem in the class. Tell students that in order to get started, they need to understand how to measure volume.

Activity: Meet Mr. Gallon (see attached)

Closure:

Math Congress: After students have completed Mr. Gallon activity, the class will come together to share their discoveries about unit conversion. The class will share their Mr./Miss Gallon and their findings from the Liquid Measurement Math Investigation.

Homework:
Finish conversions on
Liquid Measurement Math Investigation #1

Assessment:
Check for accurate construction of Mr. Gallon.

Liquid Measurement Math Investigation #1 will be checked for completion and accuracy. These will be placed in students' Math Journal.

Meet Mr. Gallon!

(Teacher Plan)

In this activity, students will label the containers with the correct unit of liquid measurement and learn to convert units within the customary system by pouring water from one container to another. Mr. Gallon will be used as a memory device and as an illustration of the proportional relationship between the units of the customary measurement system. The students will experience hands on measurement and conversion between the units.

Before Lesson Preparation:

1.) Collect milk and juice cartons in cup, pint, quart, and gallon sizes and attach Velcro circles to each. (These can be reused!) Place sets into 6 plastic dishpans.

2.) Prepare a set of Mr. Gallon handouts for each student.

3.) Prepare laminated Mr. Gallon body parts with Velcro circles. (These can also be reused!)

Beginning the lesson:

Part One: (Day One)

1.) Each student will receive Mr. Gallon handouts with instructions. The handouts are attached.

2.) Start with all rectangles stacked together and point out to students that all of the papers are the same size. Students will leave one rectangle intact (the gallon) and will label it ‘gallon’.

3.) The next rectangle will be folded in half, then in half again (4 quarts), then cut along the score lines. Each new rectangle should be labeled ‘quart’.

4.) The next full rectangle will be folded in half and half again. Students will cut these four sections apart and then cut each in half again (8 pints). Each new rectangle will be labeled ‘pint’.

5.) The last remaining rectangle will be divided into 16 new rectangles (16 cups) and labled ‘cup’.

6.) Allow students to move the new rectangles around and see that two cup rectangles are the same as a pint, two pints are the same as a quart, etc.

7.) Model the construction of the class-sized Mr. Gallon on the board in the front of the class. As you place a piece, the students will copy with their Mr. Gallon pieces. Using a glue stick, the pieces should be attached to a large piece of construction paper.

8.) Leave the class-sized Mr. Gallon on the board; he will be on display for the duration of the unit.

Part Two: (Day Two)

9.) Divide students into groups of 4-5.

10.) Give each group a set of containers, plastic dishpan and a set of laminated Mr. Gallon body parts. Ask them to label the containers with the correct body part (cup, pint, quart, gallon). Assist by reminding them that the cup is the smallest part, so that should be placed on the smallest container. The gallon is the largest part and should be placed on the largest container, etc.

11.) Observe each group to make sure that the containers are labeled correctly.

12.) Ask students what type of product usually comes in the different-sized containers. (fruit juices, milk, cream, etc.)

13.) Working over the plastic dishtub, allow the students to fill their cup container and use it to fill the pint container, then use the pint container to fill the quart container, etc. Students will record the number of units that it takes to fill the larger units on their investigation sheet.

Closure:

14.) Have class come back together in the math circle for Class Discussion. Ask the class questions about how much each container could hold. Ask them what that amount is called (liquid volume). Ask for volunteers to answer the first two conversions on the investigation sheet. The rest will be done for practice at home.

15.) Explain that our job is going to be finding out how to make a home for Ripley in our classroom.

Differentiation:

The activity sheet requires grade level reading proficiency. Groups should be created with this in mind. Students of lower reading levels should be placed with at or above grade reading level students who can help to support them during the lesson.

Student groups should be formed with mixed ability levels. The group environment will allow for students who have physical disabilities to participate as part of a team.

Advanced students who quickly figure out the lesson will still benefit from the hands on practice of measurement.

Liquid Measurement
Unit Vocabulary

Liquid Volume	The amount of liquid a container or object can hold.
Gallon	A unit of liquid measurement in the customary system equal to four quarts.
Quart	A unit of liquid measurement in the customary system which is one quarter (1/4) of a gallon.
Pint	A unit of liquid measurement in the customary system equal to one half (1/2) of a quart.
Cups	A unit of liquid measurement in the customary system equal to one half (1/2) of a pint.
Conversion	The act of changing units to an equivalent value.
Liter	A unit of liquid measurement in the metric system equal to 1000 milliliters. A liter is a slightly more than one quart.
Milliliter	A unit of liquid measurement in the metric system equal to one one-thousandth of a liter.

Fun Facts

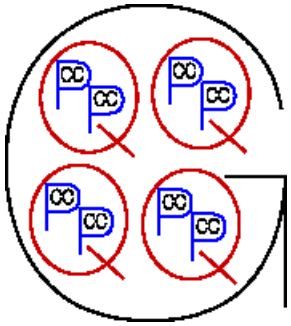
The gallon is the oldest standard used in measuring liquid. The word "gallon" comes from an Old Gaelic word for "bowl." A gallon has eight parts called pints. When gallon was first defined, it was defined as the volume of eight pounds of wheat.

The word quart comes from quarter as in a quarter (or 1/4) of a gallon.

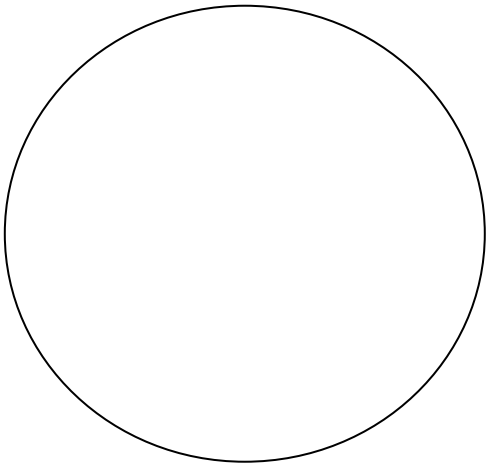
The word pint comes from the old French word pinte, which meant a mark painted on a container.

Why do you think a cup is called a cup?

Mr. Gallon
Emblem



Mr. Gallon
Face



Meet Mr. Gallon!

Liquid Measurement Investigation #1

In this activity, your team will label the containers with the correct unit of liquid measurement and learn to convert units within the customary system by pouring water from one container to another.

Unit Vocabulary					
Gallon	Quart	Pint	Cup	Liquid Volume	Conversion

Activity Procedure

Note: All containers must stay in or over the plastic dishpan at all

times!

1.) In front of your team, there are 4 different containers in a dishpan and laminated Mr. Gallon parts. Working with your team, try to figure out which part goes with which container and then attach the part.

2.) Carefully, fill your cup with water, then pour the cup into the next largest container. Pour more another cup into the container.

Is it full now? _____
How many cups did you use to fill the container?_____
What unit does the container hold? _____

3.) Experiment with the other containers. Try pints to quarts, quarts to gallons, cups to gallons, etc.

How many units does it take to fill the other containers?

_____cups fills _____pint

_____pints fills _____quart

_____quarts fills _____ gallon

Create your own!

_____ fills _____

4.) Come back to the math circle to discuss your results!

Conversion Time!

When you discovered how many of one unit it took to fill a larger or smaller unit, you made a *conversion*. Thinking about the experiment that we just did and using Mr. Gallon as a reminder, try some more unit conversions!

2 Cups = _____Pint 2 Pints = _____Quart

4 Quarts = _____Gallon

Now that you have the basics, let's try something a little more interesting.

1.) How many cups are in a quart?_____

2.) How many cups are in a gallon?_____

3.) How many pints are in a quart?_____

4.) How many pints are in a gallon?_____

Bonus:

5.) A quart is what part of a gallon?_____

6.) A cup is what part of a pint?_____

Super Bonus Question:

If Mary Jane has a gallon of apple juice and wants to pour it into glasses that hold one cup each, how many of her friends will get to try the juice?

_____