**Learning Experience:**

**Discovering Capacity – Guided Math**

**gwin120**

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| **AKS**: 34.MD.1 – compare one unit to another within a single system of capacity measurement and record measurement equivalents in a two-column table, including l, ml, c, pt, qt, gal. |
| **Vertical Alignment:** |
| **Standards for Mathematical Practice**:   1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Model with mathematics.   8. Look for and express regularity in repeated reasoning. |
| **Materials:** Containers (cup, pint, quart, gallon, liter, milliliter)  Tools for Measurement blackline masters (3 pages)  Capacity by Henry Pluckrose  Hershey’s Weights and Measures by Jerry Pallotta  *Optional materials:* ThinkMath lessons 9.6, 9.7, 9.8, 15.4, 15.5 |
| **Vocabulary:**  cup  pint  quart  gallon  liter  milliliter  capacity |
| **Essential Questions**:  How are fluid ounces, cups, pints, quarts, and gallons related?  How can fluid ounces, cups, pints, quarts, and gallons be used to measure capacity?  How can we estimate and measure capacity?  How do we compare customary measures of fluid ounces, cups, pints, quarts, and gallons?  How do we compare metric measures of milliliters and liters? |
| **Activating Strategy:** Pre-assessment: Teacher Email or Text Message  Ask students to write and send an email or text message to you about the upcoming unit. Select from the following prompts or come up with ideas of your own:   * I know that… * I learned about this by… * This makes me think of… * I am not sure about… * By the end of the unit, I’d like to know… * I’d enjoy this unit most if… * On a scale of 1 to 4, my interest in this unit is probably a \_\_\_ because… * I think this topic is important to learn about because…   You may select particular prompts for all students to respond to, let the students choose from a list of prompts, or ask each students to respond to a particular number of prompts (e.g., ask them each to choose two).  Heacox, Diane. *Making Differentiation a Habit*. Minneapolis, MN: free spirit publishing, 2009. |
| **Instructional Activity**:  **Day 1:** Guided Group- Ask students what they know about gallons, quarts, pints and cups.  Each student or group gets measuring tools and a container of water. Discuss the correct name for each container. Allow students to explore the relationships using the containers and water, and then record the information in their math notebooks.  Questions:   * How many quarts of water did it take to fill the gallon container? * How many pints did it take to fill the quart? * How many pints would it take to fill the gallon container?   Have students demonstrate the answers to the questions.  Groups: Interactive Technology (All metric measurement terms:  <http://www.bgfl.org/bgfl/custom/resources_ftp/client_ftp/ks2/maths/measures/index.htm> ), Vocabulary Practice (students create chart: label page as gallon) - ,  Independent Practice - Tools for Measurement blackline masters (3 pages)  **Day 2:** Guided Group- Display and briefly discuss the Frayer model (at the end of this document). Allow students to complete the Frayer model independently in their math notebook. Read the first word problem and solve it using the measuring containers and water or punch. Use the questions from day 1 for the word problem.  Groups: Interactive Technology (Metric capacity practice:  <http://www.bbc.co.uk/skillswise/game/ma23capa-game-taking-measures-capacity> ), Vocabulary Practice – buddy reading of books & record 3 facts or ideas from the book, Practice – Capacity Concentration game  **Day 3:** Guided Group- Have students repeat Day 1 activity with metric units and Frayer model.  Groups: Interactive Technology (Metric conversion practice:  <http://www.iboard.co.uk/iwb/115>), Practice 1 – M – Capacity in Customary Units pdf file, Practice 2 – M – Capacity in Metric Units pdf file  **Day 4:** Guided Group- Read & discuss the “Got Milk” exemplar. Work through step by step, using a chart to show work.  Groups: Interactive Technology (Metric conversion concentration:  <http://sheppardsoftware.com/mathgames/measurement/MeasurementLiters.htm>), Practice – followme\_capacity game, Independent Practice – Day 4 Independent Practice pages   1. Expanding the experience 2. Extending the experience |
| **Summarizing**:  Show video – Discovering\_Math\_\_Primary\_\_Measurement (54 minutes, available through GPB Education/ Digital Education – [www.gpb.org/education](http://www.gpb.org/education)) |

Frayer Model

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| **What it is**  **Capacity** | **What it is not** |
| **Units** | **How would you use it** |