Grade Level	5	**Content Area**	Mathematics
Course Title (grades 9-12 Only)	NA		
Expected Prior Knowledge *The knowledge/skills mastered earlier in the year foundational to the mastery of the required Standard in the current sample.*	Students convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems. Adding, subtracting, multiplying, dividing fractions. Finding the mean.		
Alignment to Program of Instruction *Briefly outline methods of instruction found in this sequence of lessons that align to the Program of Instruction described in A.3.*	Students work both collaboratively and independently to achieve a thorough common core standard based understanding in order to apply mathematics knowledge to real world situations. Instruction encourages accuracy, precision and problem solving skills as students learn the basic principles of mathematics reasoning.		
Standard Number and Description *List the Number* and full description for the Required Standard or Science Performance Objective listed in section A.6.*	**5.MD.2** Make a line plot to display a data set of measurements in fractions of a unit ($^1/_2$, $^1/_4$, $^1/_8$). Use operations on fractions for this grade to solve problems involving information presented in line plots.		
Materials/Resources Needed	"Visual Fractions Review Activity," 50 science beakers marked with 1/8 inch increments, water, data sheets		

* ***Standard Number****: For English Language Arts (Reading and Writing), use Grade, Strand, Standard (e.g., 3.RI.2). For K-8 Math, use Grade, Domain, Standard (e.g., 6.EE.7). For HS Math, use Conceptual Category-Domain, Standard (e.g., A-REI.6). For Science, use Grade, Strand, Concept, PO (e.g., 4.1.3.1).*

Lesson (add as needed)	Instructional Strategies The teacher will:	Student Activities The students will:
1	**This is a two-day lesson.** **Day 1** **Review:** Instruct students to play a game of "Around the World" to review the concepts of fractions. Explain that we will be doing some activities which require a solid fraction foundation. The following are sample questions: 1. Name 3 ways to write a ratio. Examples: 1:2, 1/2, or 1 to 2 2. What does the numerator represent? Answer: part 3. What does the denominator represent? Answer: total number of parts or the whole 4. What must be the same for fractions to be added or subtracted? Answer: denominators 5. To divide a fraction by a fraction, you must multiple by its….? Answer: Reciprocal **Warm Up:** Engage students in the "Visual Fractions Review Activity:" Show Power Point presentation containing visual representations of fractions being added, subtracted, multiplied, and divided. Students are to respond on paper to slides with answers. Review answers with students by calling on students to provide answers. Demonstrate and explain correct procedure on board if answers are incorrect. **Day 2** **Introduction:** 1. Inform students that there are 5 stations set up around the classroom. 2. Organize students into 5 groups. 3. Advise students that they will need a pencil and a piece of paper for an answer sheet. 4. Tell students that at each station there will be an activity with directions for what to do and questions that need to be answered on an answer sheet. 5. Students may work cooperatively within their groups but must ultimately answer individually.	**Review:** Play "Around the World." Stand at desk next to challenger. The student who raises hand first to answer the question is given the opportunity to answer. If they are correct, they move on to the next student. If a question is answered incorrectly, the other student may respond. If both students are incorrect, a new question is asked. The student who does not move sits down. The goal is to continue to move on and go "Around The World" (through the class). **Warm Up:** Answer questions on paper to Visual Fractions Review Activity. Provide answers to teacher. **Introduction:** Raise hand during teacher's explanation of the introduction if they have any questions.

	6. Set up each station similar to the following example (each station will differ in the amount of liquid in each beaker). 7. Fill ten beakers with a liquid in varying amounts. 8. Label beakers in eighth of an inch measurement. 9. Ask students to respond to the following. Make a line plot for the amount of liquid in each beaker. Find the total amount (sum) of liquid in all beakers. If the liquid was redistributed equally to each beaker, how much liquid would each beaker have? (Find the mean.) Find the difference (subtract) between the greatest amount of liquid in each beaker and the least amount. (Find the range.) What would the difference be in the last question if there was 2 times as much in the least beaker and 3 times as much in the greatest? **Demonstration:** Model groups moving from station to station. Answer one question from each station on an answer sheet to demonstrate how to log answers, show work and solve problems. Answer questions from students to clarify procedures involved in this activity or to clarify math procedures required to answer questions at each station. **Interaction:** 1. Move from station to station answering questions from students, ensuring they know which station to go to next. 2. Rotate students to keep them on-time.	**Interaction:** 1. Work in groups at designated station to answer questions. 2. Ask questions of students within their groups or provide assistance or clarification to others in their group. 3. Show work on answer sheets and come to individual answers. 4. Ask teacher for help if confused about how to solve problems. 5. Move to next station when prompted by teacher until they have rotated through all stations.
	Wrap Up: Assign each group to report their answers from one station from the beaker-fraction activity on the white board. Instruct students to discuss answers provided by students on the white board. Explain that if there is a disagreement, the student who disagrees must show work on the white board for answer in question that led to their answer. Mediate a discussion of errant answers and proper procedures to solve problems in question	**Wrap Up**: Check answers amongst group members to assigned station from beaker-fraction activity. Find errors and fix answers by re-doing incorrect answers and showing work on answer sheet. Write answers for their station on the board. Check their answers against the answers provided by other groups on the white board. Challenge answers if they choose by showing the work for their answer on the board.
	Individual Practice: Assign 15 questions from student textbook that correspond to the standard being taught. Explain that students must show work and that the assignment is homework and is to be turned in at the beginning of class the next day.	**Individual Practice:** Complete as homework the 15 questions assigned by teacher as practice for this standard. Turn in homework at the beginning of class the following day.

Summative Assessment Items:

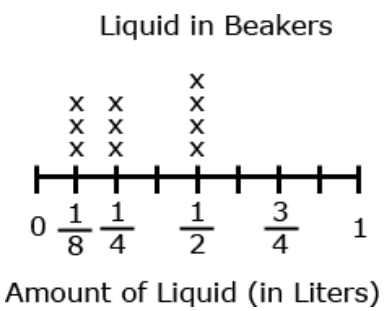
1. Make a line plot to display a data set of measurements in fractions of a unit for 10 beakers of liquid with the following measurements:

   1/2, 1/4, 1/4, 1/8, 1/8, 1/2, 1/4, 1/8, 1/2, 1/2

2. Find the mean of the liquid for the above data set of measurements. Simplify.
3. What is the total of three times the greatest amount of liquid minus two times the least amount liquid from the data set of measurements from question 1? Simplify.
4. Multiply each of the liquid amounts from the data set of measurements in question 1 by three and then find the mean. Simplify.
5. When using which operation(s) with fractions, it is necessary to find a common denominator first?
   A. Adding
   B. Subtracting
   C. Multiplying
   D. Both A and B

Answer Key: Each correct answer is awarded 1 point, and no partial credit is available. A score of 4/5 demonstrates mastery.

1.



2. 5/16
3. 1 ¼
4. 15/16
5. D