**Learning Experience:**

**Multiplying Fractions with Word Problems**

**When planning, include the following:**

**Models (Concrete—Semi-Concrete—Semi-Abstract—Abstract)**

**Problems/Situations**

**Questions**

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| **AKS**:   1. apply and extend previous understanding of multiplication to multiply a fraction by a whole number (CCGPS) (4MA\_C2012-26/MCC4.NF.4) 2. recognize a fraction a/b as a multiple of 1/b (e.g., use a visual fraction model to represent 5/4 as the product 5 x (1/4), recording the conclusion by the equation 5/4 = 5 x (1/4)) (CCGPS) (4MA\_C2012-27/MCC4.NF.4\_a) 3. solve word problems involving multiplication of a fraction by a whole number (e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?) (CCGPS) (4MA\_C2012-29/MCC4.NF.4\_c) |
| **Vertical Alignment:**  **Third Grade**   1. model and explain that a fraction 1/b is the quantity formed by 1 part when a whole is partitioned into b equal parts (CCGPS) (3MA\_C2012-16/MCC3.NF.1) 2. recognize a fraction as a number on the number line; represent fractions on a number line diagram (CCGPS) (3MA\_C2012-17/MCC3.NF.2) 3. express whole numbers as fractions and recognize fractions that are equivalent to whole numbers (e.g., express 3 in the form 3 = 3/1; recognize that 6/1 = 6; locate 4/4 and 1 at the same point of a number line diagram) (CCGPS) (3MA\_C2012-23/MCC3.NF.3\_c)   **Fifth Grade**   1. solve word problems, by using visual fraction models, involving division of whole numbers leading to answers in the form of fractions or mixed numbers (e.g., interpret 3/4 as the result of dividing 3 by 4 noting that 3/4 multiplied by 4 equals 3 and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4) (CCGPS) (5MA\_C2012-17/MCC5.NF.3) 2. apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction (CCGPS) (5MA\_C2012-18/MCC5.NF.4) |
| **Standards for Mathematical Practice**:   1. Make sense of problems and persevere in solving them. 2. Reason abstractly and quantitatively. 3. Construct viable arguments and critique the reasoning of others. 4. Model with mathematics. 5. Use appropriate tools strategically. 6. Attend to precision. 7. Look for and make use of structure. 8. Look for and express regularity in repeated reasoning. |
| **Materials:**  Kit Kats  Chart paper  Markers  Manipulatives (Fraction bars, paper pieces, fraction circles, fraction towers, and/or Cuisenaire rods.)  Tape  Copies of questions from GaDOE <http://gcps4thgradecommoncoretraining.weebly.com/uploads/1/2/4/4/12440763/ccgps_math_4_unit4frameworkse.pdf> (See pages 18-20 for more information on the following problem.) |
| **Vocabulary:**  Fraction  Numerator  Denominator  Fractional Part  Whole  Mixed Number  Improper Fraction  Multiple  Factor  Product |
| **Essential Question**:  How do we solve word problems involving multiplication of a fraction by a whole number by using fraction models and equations to represent the fraction? |
| **Activating Strategy:**  **Background knowledge**  <http://www.learnzillion.com/lessons/126-multiply-fractions-by-whole-numbers-using-models> (Use this link as a guide for teaching multiplying fractions by whole numbers.)  <http://gcps4thgradecommoncoretraining.weebly.com/uploads/1/2/4/4/12440763/ccgps_math_4_unit4frameworkse.pdf> (See pages 18-20 for more information on the following problems.)         1. Show students pictures and real Kit Kats. Discuss Kit Kats as a whole and as fractional parts. (1/4’s and ½’s) 2. Remind the students that if they persevere through the problem they will earn Kit Kats. 3. Put students in different sized groups. (Ex. 3, 4, 5, 6) 4. Give each group of students 12 ¼ manipulative pieces. (Fraction bars, paper pieces, fraction circles, fraction towers, and/or Cuisenaire rods.) 5. Ask the question, “If each person in your group gets 2/4 of a Kit Kat bar, how many Kit Kat bars will be needed?” 6. Have students solve the problem using the Exemplar Template. <https://gcps.desire2learn.com/content/enforced/7023-MOCC/Exemplars/Teacher%20Resources/Newsletter-Posters/Exemplar_graphic_organzier.xls?_&d2lSessionVal=46eyff8tyVwMF1oTADtOzv4YO> 7. Assess students as necessary and provide interventions. |
| **Instructional Activity**:   1. Post student work around the classroom. 2. Use Café framework to analyze student work. 3. 3 rounds of questions 4. After each round, students will move to chat with a new group of friends 5. Share thoughts and responses after the 4th round 6. One person will stay at the table to answer questions   Round 1  Did this group solve the problem the way your group solved it?  Defend your mathematical thinking and your solution.  Round 2  How did this group solve the problem? Was it different than the thinking and solutions in the previous rounds? If so, how?  Compare the differences to the mathematical thinking and solutions.  Round 3  Has your thinking changed in any way? If so, how?  Are you willing to defend your group’s thinking and solution?  Repeat questions as needed for additional rounds.   1. Allow students to revisit their original work and make any changes/corrections. 2. All groups with correct answers will receive their Kit Kat pieces. (Work should have been corrected through the process.) 3. Solve the following problems in whole group, small groups, guided math, and/or etc. 4. Remind the students to:      1. Act out the problem using circles and counters. 2. Draw your answer using the circle. 3. Explain your answer using words. 4. Lastly, write a number sentence for each problem 5. The four people at Carla’s birthday will get one-quarter (one-fourth) of the cake each. Carla puts 16 candles on the cake so that each person gets the same number of candles on their piece of cake. How many candles will each person get on their piece of cake?   Explanation and Number Sentence  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. The five people at Estella’s birthday will get one-fifth of the cake each. Estella puts 25 candles on the cake so that each person gets the same number of candles on their piece of cake. How many candles will each person get on their piece of cake?   Explanation and Number Sentence  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. Three people are at Emmanuel’s birthday party. Emmanuel puts 21 candles on the cake and cuts it into thirds so that each person gets the same number of candles on their piece of cake. How many candles will each person get on their piece of cake?   Explanation and Number Sentence  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. The six people at Zoe’s birthday will get one-sixth of the cake each. Zoe puts 18 candles on the cake so that each person gets the same number of candles on their piece of cake. However, one friend doesn’t like cake so Zoe ate a second piece. How many candles will each person get on their piece of cake? How many candles will Zoe get?   Explanation and Number Sentence  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_   1. **Expanding the experience**   What strategies can be used for finding products when multiplying a whole number by a fraction?  How is multiplication of fractions similar to repeated addition of fractions?   1. **Extending the experience**   Have students create their own problems with multiplying fractions by a whole number using a model. Present problems to the class.  Encourage students to create problems that will connect to measurement. |
| **Summarizing**:  In your math journal answer the essential question by explaining the steps of solving word problems using manipulatives, pictures, and mathematical reasoning. |

**Did your plans you include the following?**

**Models (Concrete—Semi-Concrete—Semi-Abstract—Abstract)**

**Problems/Situations**

**Questions**