**Learning Experience:**

**Draft2T:**

**Multiplicative Comparison with Explorers (Christopher Columbus)**

**When planning, include the following:**

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

**Problems/Situations**

**Questions**

**gwin120**

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| **AKS**:  2.OA.2 Solve multiplication and division word problems involving multiplicative comparison using drawings and equations (e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison)  Social Studies - (GPS) (4SS\_D2008-33) Compare and contrast examples of cooperation and conflict between Europeans and Native Americans [33a - examine how the exchange of ideas and goods between Native Americans and Europeans affected each group]  Social Studies - (GPS) (4SS\_D2008- 35) Use the basic economics concepts of trade, opportunity cost, specialization, voluntary exchange, productivity and price incentives to illustrate historical events [35a - describe opportunity costs and their relationship to decision-making across time such as decisions to send expeditions to the New World] |
| **Vertical Alignment:**  Third grade - 3.OA.3 Apply multiplication and division (products or dividends 0-100) to solve word problems in situations involving equal groups, arrays and measurement quantities  Third grade - 4.OA.4 Use a symbol to represent an unknown and determine the value of the unknown in a multiplication or division equation relating three whole numbers  Third grade - 9.OA.8 Solve and represent two-step word problems using the four operations, and represent with a letter standing for the unknown quantity  Fifth grade - 2.OA.2 Write simple expressions that record calculations with numbers and interpret numerical expressions without evaluating them (e.g., express the calculation "add 8 and 7, then multiply by 2" as 2 x (8 + 7)) and recognize that 3 x (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product  Fifth grade - 9.NBT.5 Multiply multi-digit whole numbers fluently using the standard algorithm |
| **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:**  markers  chart paper (poster board or other larger paper surface)  manipulatives (blocks, counters, cubes)  number lines  poems/songs/texts (teacher choice, options listed below) |
| **Vocabulary:**  factors, product, dividend, divisor, partial product, equation, digit, function table, multiple, multiplicative comparison, pattern set, multiplier, multiplication, multiply, division, divide, addition, add, subtraction, subtract, equations, unknown, remainders, reasonableness, mental computation, estimation, rounding, array, diagram, model, group, set |
| **Essential Question**:  How do we solve multiplication and division word problems involving multiplicative comparison using drawings and equations? |
| **Activating Strategy:**  Choices:  \* The Math Chef, by Joan D'Amico (recipe activities to choose from to connect with upcoming lesson, Chapter 9 "How Much Lettuce Do You Need for 6 Salads?") J:\math chef.jpg  \* YouTube video "Miss Russ 2nd Grade Christopher Columbus Song"  \* Christopher Columbus song (attached at end of lesson)  \* Christopher Columbus poem (attached at end of lesson)  \* Dinosaur Deals, by Stuart J. Murphy  \* Safari Park, by Stuart J. Murphy |
| **Instructional Activity**:  Whole Group Introduction:  After referencing Christopher Columbus' three ships have three girls come up to the front of the room to represent the ships: Nina, Pinta, and Santa Maria (you could have them wear labels for the ships). "If Christopher Columbus had three times as many ships he could have brought more supplies with him on his journey. How can we find out how many ships that would be? Let's make three groups of ships that each have three in them. We already have the first group, so now we only need two more groups." Teacher pulls up three students to make the second group and three students to make the third group. Show and explain that this is three groups with three in each group. Three times as many ships as the initial three ships would be a product of nine ships. Write the equations 3 x 3 = 9 on chart paper or using a Mimio. Draw three ships in each of three groups.    pirate%20ship[1]pirate%20ship[1]pirate%20ship[1]  pirate%20ship[1]pirate%20ship[1]pirate%20ship[1]  pirate%20ship[1]pirate%20ship[1]pirate%20ship[1]  3 x 3 = 9  Make a connection to using an array to show the ships. Make an array using the students and connect the physical array to the more abstract array written on the paper.  Challenge students to figure out how many ships Columbus would have if he had four times as many or six times as many. Use students to model, arrays on chart paper, and written equations  Partner Work or Small Group Work:  Students receive two problems for journal work in exemplar style. ( Can be done in journals, on dry erase boards, or using technology.)  1) The Santa Maria has four barrels of water on board. The Nina has two times as much. How many barrels of water does the Nina has on board?  2) The Pinta has twenty-four sailors and the Santa Maria has only eight. How many times as many sailors does the Pinta have as the Santa Maria?  Students work together to use manipulatives to show the problem. The groups then create drawn models for solving the problem. Next, students write an equation to solve their problem. Finally, they write to explain how they found their solutions.  Small groups can then share their work with one another (or as a whole class sharing) in order to explore their thinking more deeply by explaining their process.   1. Expanding the experience   Trading With the Natives Card Game:  Materials: 1 deck of playing cards sorted (numbers 2 - 10 in one stack, letters A, J, Q, and K in another stack, paper, pencils  Important Information: Letter cards tell us the multiplicative comparison number (what the number of items being traded are being multiplied by: three times as many as \_\_\_\_\_\_\_), Number cards are the number of items being traded.  Letter card values: A - 2, J- 3, Q - 4, K - 5  Partner Game:  Step 1: Sort cards into two stacks.  Step 2: One person is the Native American and one person is Christopher Columbus.  Step 3: The person with the shortest pinky goes first.  Step 4: The first person pulls a card from each stack. (e.g., 9 and K)  Step 5: The cards tell that this person is trading 5 times as many as 9 (choose their own item for the trade item to pretend with).  Step 6: Solve to find out how many items are being traded.  Step 7: The partner pulls a card from each stack.  Step 8: The partner's cards tell that this person is trading \_\_\_ times as many as \_\_\_\_.  Step 9: Solve to find out how many items are being traded.  Step 10: Partners can compare which person traded more. Discuss: Was this a fair trade? Was this a trade that you would make? Why or why not?  Step 11: Repeat steps 4 - 10 for each round.   1. Extending the experience   Choices:  \* Harcourt Math Lesson 7.5  \* Troop County Schools website, Curriculum Map for 4th grade, p. 11  \* Think Math Lesson 13.1 and Lesson 13.5 |
| **Summarizing**:  3, 2, 1 = list 3 things you learned, list 2 things you are confused or unsure about, and list 1 thing you feel confident enough about to help others with  Going through the MOCC exemplars page locate the Best of Math 3 series and download either "Raising Chicks" or "Jeff's Marble Collection." Students complete the exemplar as an assessment. |

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

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

**Problems/Situations**

**Questions**

**MCC4. OA.2**

**Instructional Strategies**

Use multiplication and division fact families to show the relationship between division and multiplication. Explain how one is the inverse of the other.

Give the students story problems with multiplicative comparisons. Have them draw a picture or create a model of the problem, write an equation with a symbol for the unknown variable, and solve.

**Assessment Strategies**

**Skill-Based Task:**

Create and solve an equation from a given word problem.

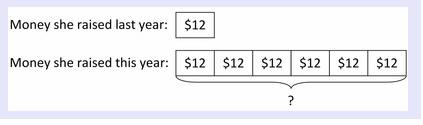
**Problem Task:**

Over the summer, Raul read 8 books. Natalia read 4 times as many books. How many books did Natalia read? Draw a picture or create a model of the problem, write an equation with a symbol for the unknown variable, and solve.

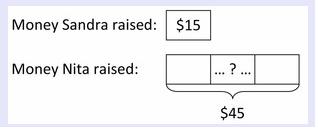
Create a Venn diagram that compares and contrasts additive comparison and multiplicative comparison.

1. Helen raised $12 for the food bank last year and she raised 6 times as much money this year. How much money did she raise this year?

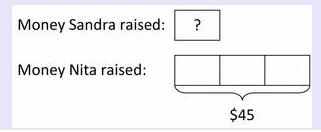
She raised six times as much money (as shown in the diagram) so she raised 6×12=72



1. Sandra raised $15 for the PTA and Nita raised $45. How many times as much money did Nita raise as compared to Sandra?

Helen raised $72 this year. ?×15=45 is equivalent to 45÷15=?

1. Nita raised $45 for the PTA, which was 3 times as much money as Sandra raised. How much money did Sandra raise?

Nita raised 3 times as much as Sandra. 3×?=45  is equivalent to 45÷3=?

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CHRISTOFO COLUMBO (Christopher Columbus)

1911 (out of copyright) with words by

Ring Lardner.

I'll sing to you about a man whose name you'll find in hist'ry

He solved a problem very deep which long had been a myst'ry;

Navigators young and old gave way to him quite fitly,

His name it was Columbus and he came from sunny It'ly.

He knew the earth was round-ho!

That land it could be found-ho!

That geographic, hard and hoary

Navigator, gyratory

Christofo Columbo.

To the Kings and Queens of Europe, Columbus told his theory,

They simply thought him crazy, and asked him this here query,

How could the earth stand up if round, it surely would suspend,

For answer, C'lumbus took an egg and stood it on its end.

He knew the earth was round-ho!

That land it could be found-ho!

That geographic, hard and hoary

Navigator, gyratory

Christofo Columbo.

In Fourteen Hundred and Ninety-two,'twas then Columbus started,

From Pales on the coast of Spain to the westward he departed,

His object was to find a route, a short one to East India,

Columbus wore no whiskers, and the wind it blew quite windy.

He knew the earth was round-ho!

That land it could be found-ho!

That geographic, hard and hoary

Navigator, gyratory

Christofo Columbo.

When Sixty days away from land, upon the broad Atlantic,

The sailors they went on a strike which nearly caused a panic,

They all demanded eggs to eat for each man in the crew,

Columbus had no eggs aboard, but he made the ship lay too.

He knew the earth was round-ho!

That land it could be found-ho!

That geographic, hard and hoary

Navigator, gyratory

Christofo Columbo.

The hungry crew impatient grew, and beef-steak they demanded,

Equal to the emergency, Columbus then commanded

That ev'ry sailor who proves true, and his duty never shirks,

Can have a juicy porterhouse, "I'11 get it from the bulwarks."

He knew the earth was round-ho!

That land it could be found-ho!

That geographic, hard and hoary

Navigator, gyratory

Christofo Columbo.

Not satisfied with steak and eggs, the crew they yelled for chicken,

Columbus seemed at a loss for once, and the plot it seemed to thicken,

The men threatened to jump overboard, Columbus blocked their pathway,

And cried: "If chicken you must have, I'll get it from the hatchway.

He knew the earth was round-ho!

That land it could be found-ho!

That geographic, hard and hoary

Navigator, gyratory

Christofo Columbo.

The sailors now so long from home with fear became imbued,

On the twelfth day of October their fears were all subdued,

For after Ninety days at sea, they discovered America's shores,

And quickly made a landing on the Isle of Salvador.

He knew the earth was round-ho!

That land it could be found-ho!

That geographic, hard and hoary

Navigator, gyratory

Christofo Columbo.

Christopher Columbus

By: Ron Brown

Way back in 1492

All the people thought the world was flat

But young Columbus simply disagreed

The earth was round, he was sure of that.

Way back in 1492

The queen of Spain gave him three strong ships.

He headed West on the ocean blue,

In search of the Indies and a treasure or two.

Sail away Christopher Columbus

Sail away on the deep blue sea

Sail away Christopher Columbus

On the Nina and the Pinta and the Santa Maria

Look what you have found!

Sail away Christopher Columbus

It's a new world big and round.

Sail away!

Many thanks to Ron Brown for permission to display these lyrics.

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