Distance Traveled (ECR)

Overview

Students will use the four operations on multi-digit whole numbers to answer questions about traveling to different cities in Louisiana.

Standards

Use place value understanding and properties of operations to perform multi-digit arithmetic.

4.NBT.B.4 Fluently add and subtract multi-digit whole numbers using the standard algorithm.

4.NBT.B.5 Multiply a whole number of up to four digits by a one-digit whole number, and multiply 2 two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

4.NBT.B.6 Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are prerequisites for student success with this task's standards.

Grade Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
4.NBT.B.4	• 3.NBT.A.2 • 4.NBT.A.1	1. Add 534 + 251 + 169. a. 954 2. Subtract 641 – 299. a. 342	• http://learnzillion.com/lessonsets/622-add-and-subtract-using-the-standard-algorithm
4.NBT.B.5	• 3.NBT.A.2 • 3.NBT.A.3 • 3.OA.B.5 • 3.OA.C.7 • 4.NBT.A.1	1. Multiply 265 x 6. a. 1,590 2. Multiply 1,528 x 4. a. 6,112	• http://www.illustrativemathematics.org/illustrations/1445 • http://learnzillion.com/lessonsets/360-multiply-multidigit-whole-numbers • http://learnzillion.com/lessonsets/3-solve-multiplication-problems
4.NBT.B.6	• 3.NBT.A.2 • 3.OA.B.5 • 3.OA.C.7	1. Divide 1162 ÷ 7. a. 166 2. Divide 1624 ÷ 6. a. 270 with a remainder of 4 3. http://www.illustrativemathematics.org/illustrations/1774	• http://learnzillion.com/lessonsets/260-find-whole-number-quotients-and-remainders-with-up-to-fourdigit-dividends

After the Task

For problem 2, students may only add the two values given in the problem. Have them read the problem again and create a list to organize the information given. Students will need to use the table provided at the beginning to find the distances for the first and last legs of the trip. Some students may struggle if they try to add all four distances at the same time. Have students complete the work by adding the first two distances, then adding the third distance to their result, and so on. Be sure students are not using a string of equal signs that do not make sense (e.g., 271 + 239 = 510 + 284 = 794 + 187 = 981).

For problem 3, students may forget to multiply 80 by 2 (or add 80 + 80) to find the total distance Rachel drives each day. Have students read the problem again and ask them what the phrase "back and forth" means. Have students figure out how far Rachel drives on one day. Provide additional practice with multistep word problems involving multiplication. Also, students can use the standard algorithm to solve this problem, although it is not required to be mastered in grade 4. The intent of 4.NBT.B.5 is to have students use strategies that demonstrate an understanding of place value rather than building fluency with the algorithm.

For problem 4, students can use the standard algorithm, although it is not required to be mastered in grade 4. The intent of 4.NBT.B.5 is to have students use strategies that demonstrate an understanding of place value rather than building fluency with the algorithm. Guide students to use the relationship between multiplication and division to find the number one would multiply by 6 to get to 1,146. Ask students to identify multiplication facts involving 6 that could be helpful in finding the unknown factor. Have students use place value to find products that would get them close to the final product of 1146. Connect the work with multiplication and place value to the standard algorithm.

Student Extended Constructed Response

Distance (in miles) from Baton Rouge, LA

City, State	Distance One Way (in miles)
Alexandria, LA	126
Birmingham, AL	399
Bossier City, LA	250
Houston, TX	271
Monroe, LA	187
Nashville, TN	587
New Orleans, LA	80
Orlando, FL	695

The chart above lists the one-way distance to travel by car from Baton Rouge, Louisiana, to various cities in the southern region of the United States. Use the chart to answer questions 1-3.

1. How much farther is it to drive from Baton Rouge, LA, to Orlando, FL, than it is to drive from Baton Rouge, LA, to Birmingham, AL? Show your work.

2. On Monday morning, Gunther left Baton Rouge, LA, for Houston, TX. On Tuesday, Gunther drove from Houston, TX, to Dallas, TX, which is 239 miles. On Thursday, he left Dallas, TX, and drove to Monroe, LA, which is 284 miles. On Friday, Gunther returned to Baton Rouge, LA, from Monroe, LA. How many miles did Gunther drive in all? Show how you found your answer.

3. Rachel works in New Orleans, LA, but lives in Baton Rouge, LA. She drives back and forth to work 5 days each week. How many miles does she drive going back and forth to work each week? Use equations, arrays, and/or area models to show how you arrived at your answer.

4. Roland is moving from Baton Rouge, LA, to Philadelphia, PA. He is driving his car to his new home, which is 1,146 miles away. He has 6 days to get to his new house before the movers arrive with his belongings. If Roland wants to drive the same distance each day, how far should he drive each day to arrive in Philadelphia on day 6? Show or explain how you found your answer.

Extended Constructed Response Exemplar Response

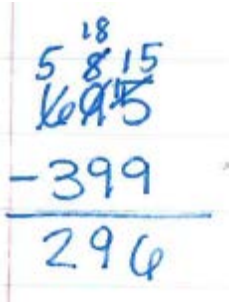
Distance (in miles) from Baton Rouge, LA

City, State	Distance One Way (in miles)
Alexandria, LA	126
Birmingham, AL	399
Bossier City, LA	250
Houston, TX	271
Monroe, LA	187
Nashville, TN	587
New Orleans, LA	80
Orlando, FL	695

The chart above lists the one-way distance to travel by car from Baton Rouge, LA, to various cities in the southern region of the United States. Use the chart to answer questions 1-3.

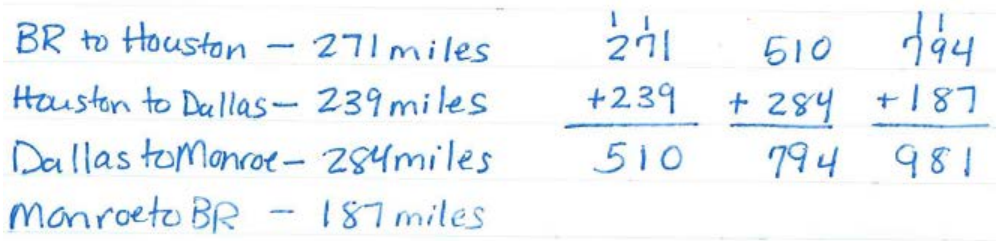
1. How much farther is it to drive from Baton Rouge, LA, to Orlando, FL, than it is to drive from Baton Rouge, LA, to Birmingham, AL? Show your work.

   It is 296 miles farther to Orlando than to Birmingham from Baton Rouge.



2. On Monday morning, Gunther left Baton Rouge, LA, for Houston, TX. On Tuesday, Gunther drove from Houston, TX, to Dallas, TX, which is 239 miles. On Thursday, he left Dallas, TX, and drove to Monroe, LA, which is 284 miles. On Friday, Gunther returned to Baton Rouge, LA, from Monroe, LA. How many miles did Gunther drive in all? Show how you found your answer.

   Gunther drove a total of 981 miles.



3. Rachel works in New Orleans, LA, but lives in Baton Rouge, LA. She drives back and forth to work 5 days each week. How many miles does she drive going back and forth to work each week? Use equations, arrays, and/or area models to show how you arrived at your answer.

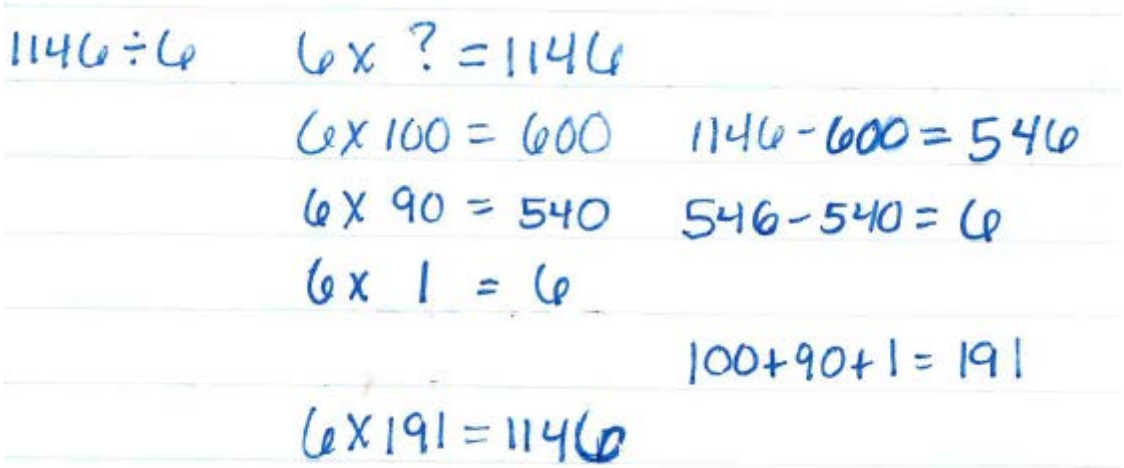
   Rachel drives 160 miles each day because 80 + 80 = 160. If she drives 5 days each week, then she drives 160 x 5.

   $160 \times 5 = (100 + 60) \times 5 = (5 \times 100) + (5 \times 60) = 500 + 300 = 800$

   Rachel drives 800 miles each week.

4. Roland is moving from Baton Rouge, LA, to Philadelphia, PA. He is driving his car to his new home, which is 1,146 miles away. He has 6 days to get to his new house before the movers arrive with his belongings. If Roland wants to drive the same distance each day, how far should he drive each day to arrive in Philadelphia on day 6? Show or explain how you found your answer.

   Roland should drive 191 miles per day to arrive in Philadelphia on day 6.



Birthday Party Food (ECR)

Overview

Students will compare, add, and subtract fractions to answer questions about the food at a birthday party.

Standards

Extend understanding of fraction equivalence and ordering.

4.NF.A.2 Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the result of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

4.NF.B.3 Understand a fraction a/b with a > 1 as a sum of fractions 1/b.

a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are prerequisites for student success with this task's standards.

Grade Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
4.NF.A.2	• 4.NF.A.1	1. Compare $\frac{2}{5}$ to $\frac{4}{8}$ using >, =, or <. a. $\frac{2}{5} < \frac{4}{8}$ 2. Compare $\frac{2}{3}$ to $\frac{4}{9}$ using >, =, or <. a. $\frac{2}{3} > \frac{4}{9}$ 3. http://www.illustrativemathematics.org/illustrations/812 4. http://www.illustrativemathematics.org/illustrations/811	• http://www.illustrativemathematics.org/illustrations/743 • http://www.illustrativemathematics.org/illustrations/881 • http://learnzillion.com/lessonsets/220-compare-fractions-by-creating-common-denominators-or-numerators-2 • http://learnzillion.com/lessonsets/177-compare-fractions-using-a-benchmark-fraction • http://learnzillion.com/lessonsets/176-compare-fractions-by-creating-common-denominators-or-numerators • http://learnzillion.com/lessonsets/7-compare-fractions-of-different-types

Grade Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
4.NF.B.3	• 3.NF.A.2 • 3.NF.A.1 • 4.NF.A.1	1. Add $\frac{4}{5} + \frac{2}{5}$. a. $\frac{6}{5}$ or $1\frac{1}{5}$ 2. Add $3\frac{2}{3} + 2\frac{2}{3}$ a. $6\frac{1}{3}$ 3. Subtract $\frac{7}{8} - \frac{4}{8}$. a. $\frac{3}{8}$ 4. http://www.illustrativemathematics.org/illustrations/831 5. http://www.illustrativemathematics.org/illustrations/835 6. http://www.illustrativemathematics.org/illustrations/968	• http://www.illustrativemathematics.org/illustrations/833 • http://www.illustrativemathematics.org/illustrations/168 • http://www.illustrativemathematics.org/illustrations/171 • http://www.illustrativemathematics.org/illustrations/173 • http://www.illustrativemathematics.org/illustrations/169 • http://learnzillion.com/lessonsets/312-understand-addition-and-subtraction-of-fractions-and-decomposing-fractions-2 • http://learnzillion.com/lessonsets/290-understand-addition-and-subtraction-of-fractions-and-decomposing-fractions-1 • http://learnzillion.com/lessonsets/343-add-and-subtract-mixed-numbers-with-like-denominators • http://learnzillion.com/lessonsets/178-add-and-subtract-mixed-numbers-with-like-denominators • http://learnzillion.com/lessonsets/82-add-subtract-and-compare-fractions

After the Task

Students who have trouble comparing fractions with different denominators should be encouraged to draw fraction models to help them make the comparison. Remind students that the models they draw must have the same-size whole to compare the fractional parts.

Students may struggle with problem 3 when subtracting mixed numbers. Discuss with students how they can change a whole number into a fraction. Have students make use of structure to see that mixed numbers like $4\frac{3}{8}$ can be rewritten as $4 + \frac{3}{8}$ or $\frac{8}{8} + \frac{8}{8} + \frac{8}{8} + \frac{8}{8} + \frac{3}{8}$. This creates improper fractions, eliminating the need to work with whole numbers and fractions separately. Another option might be to ask students if they can think of a way to rewrite the equation using addition.

Student Extended Constructed Response

1. Taylor and Amro celebrated their birthdays at the same party. They each had their own birthday cake. Each cake was the same size. After the party, $\frac{1}{2}$ of Taylor's cake was left. There was $\frac{5}{12}$ of Amro's cake left. Which cake had more left? Explain your reasoning.

2. Taylor and Amro decided to share a pizza during their party. Taylor ate $\frac{3}{6}$ and Amro ate $\frac{2}{6}$ of the pizza. How much of the pizza did they eat together? Show how you found your answer.

3. There are $4\frac{1}{8}$ pizzas left over from the birthday party. After Taylor and Amro gave some pizza to their friends, there were $2\frac{4}{8}$ pizzas left. Taylor thinks they gave $1\frac{3}{8}$ pizzas to friends. Do you agree with Taylor? Explain why you agree or disagree. Use equations or fraction models to support your explanation.

Extended Constructed Response Exemplar Response

1. Taylor and Amro celebrated their birthdays at the same party. They each had their own birthday cake. Each cake was the same size. After the party, $\frac{1}{2}$ of Taylor's cake was left. There was $\frac{5}{12}$ of Amro's cake left. Which cake had more left? Explain your reasoning.

   There is more of Taylor's cake left over. I know from creating equivalent fractions that $\frac{1}{2}$ is $\frac{6}{12}$, and $\frac{6}{12}$ is more than the $\frac{5}{12}$ that was left of Amro's cake.

2. Taylor and Amro decided to share a pizza during their party. Taylor ate $\frac{3}{6}$ and Amro ate $\frac{2}{6}$ of the pizza. How much of the pizza did they eat together? Show how you found your answer.

   The total amount of pizza they ate is $\frac{5}{6}$ of the whole pizza.
   $\frac{3}{6} + \frac{2}{6} = \frac{5}{6}$.

3. There are $4\frac{1}{8}$ pizzas left over from the birthday party. After Taylor and Amro gave some pizza to their friends, there were $2\frac{4}{8}$ pizzas left. Taylor thinks they gave $1\frac{3}{8}$ pizzas to friends. Do you agree with Taylor? Explain why you agree or disagree. Use equations or fraction models to support your explanation.

   I disagree with Taylor. If Taylor thinks that $1\frac{3}{8}$ pizzas were given to friends, then $1\frac{3}{8} + 2\frac{4}{8}$ should equal $4\frac{1}{8}$. Since $1\frac{3}{8} + 2\frac{4}{8} = 3\frac{7}{8}$ and not $4\frac{1}{8}$, Taylor cannot be correct.

   Alternative solution:
   I disagree with Taylor. They started with $4\frac{1}{8}$ pizzas and have $2\frac{4}{8}$ pizzas left.
   I can subtract $4\frac{1}{8} - 2\frac{4}{8}$ to find how much they gave away to friends.
   $4\frac{1}{8} = 4 \times \frac{8}{8} + \frac{1}{8} = \frac{32}{8} + \frac{1}{8} = \frac{33}{8}$ *and* $2\frac{4}{8} = 2 \times \frac{8}{8} + \frac{4}{8} = \frac{16}{8} + \frac{4}{8} = \frac{20}{8}$
   So $\frac{33}{8} - \frac{20}{8} = \frac{13}{8} = 1\frac{5}{8}$

   Taylor and Amro gave away $1\frac{5}{8}$ pizzas, not $1\frac{3}{8}$ pizzas.

Big Ben's Bakery (ECR)

Overview

Students will solve word problems involving multiplicative comparison and write statements of multiplicative comparison.

Standards

Use the four operations with whole numbers to solve problems.

4.OA.A.1 Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies, including rounding.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are prerequisites for student success with this task's standards.

Grade-Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
4.OA.A.1	• 3.OA.A.1 • 3.OA.A.3	1. Write an equation that represents "56 is 8 times as many as 7." a. 56 = 8 x 7 2. There are 12 girls and 6 boys in the fourth-grade class. The equation 12 = 6 x 2 represents the number of girls compared to the number of boys. Write a sentence describing the comparison given by the equation. a. There number of girls is 2 times as many as the number of boys (or 12 is 2 times as many as 6).	• http://www.illustrativemathematics.org/illustrations/262 • http://learnzillion.com/lessonsets/539-interpret-multiplication-as-a-comparison

Grade-Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
4.OA.A.2	• 3.OA.A.3	1. Sarah raised $74 for the food bank last year. She raised 3 times as much money this year. How much money did she raise this year? a. $222 2. A rubber band is stretched to 12 cm. It is 4 times as long as its original length. How many centimeters long is its original length? a. 3 cm 3. http://www.illustrativemathematics.org/illustrations/263	• http://www.illustrativemathematics.org/illustrations/365 • http://learnzillion.com/lessonsets/615-solve-word-problems-using-multiplicative-comparisons
4.OA.A.3	• 3.OA.D.8 • 4.NBT.A.3	1. Alex brought 5 snacks to school to share with his class. Reagan brought 3 times as many snacks as Alex to share. How many snacks did Alex and Reagan bring in all? a. 20 snacks 2. http://www.illustrativemathematics.org/illustrations/1289	• http://www.illustrativemathematics.org/illustrations/13 • http://www.illustrativemathematics.org/illustrations/1301 • http://www.illustrativemathematics.org/illustrations/1807 • http://learnzillion.com/lessonsets/415-solve-multistep-word-problems-using-the-four-operations • http://learnzillion.com/lessonsets/352-solve-multistep-word-problems • http://learnzillion.com/lessonsets/47-assess-the-reasonableness-of-multiplication-and-division-answers

Real-World Preparation:

- **What is a dozen?** Some foods, like eggs and donuts, are sold by the dozen, which means there are 12 items in the group.

After the Task

Students may struggle with comparisons, such as the following: Bobby ate three times as many cookies as Ben; what operation is mentioned? This type of question is designed to help students compare numbers using multiplication. Provide additional practice with similar problems. Encourage students to draw models to find the amounts.

Students may struggle with generating comparisons in problem 3. Ask students to generate some examples of multiplicative comparisons. For example, there are half as many girls in our class as boys, or there are twice as many girls in our class as boys. If fractions have been introduced, question them about showing a fractional form. For example, Bobby ate $\frac{1}{3}$ more cookies than Ben.

For additional practice with the concepts in this task, have the class collect data about favorite items in different categories (type of pet, color, subject, etc.). Then have the students use the data to write multiplicative comparisons.

Student Extended Constructed Response

Big Ben's Bakery is a shop that sells cakes, cookies, donuts, and pastries. Answer each question and show your work.

1. The bakers at Big Ben's Bakery made 48 chocolate donuts, which is 6 times the number of cream-filled donuts they made.

    a. How many more chocolate donuts than cream-filled donuts did they make? Use an equation to show how you answered the question.

    b. How many dozens of chocolate donuts did they make?

2. Tess ordered three times as many cookies as Charles ordered and six times as many cookies as Shay ordered. The total number of cookies ordered by Tess is 36.

    a. How many cookies did Tess, Charles, and Shay order altogether? Use an equation to show how you solved the problem.

    b. How many more cookies did Tess order than Charles and Shay together?

3. Each year, the bakery has a donut-eating contest to see who can eat the most donuts. The chart below shows how many donuts each person ate during the contest.

Jaylan	Evie	Jake	Amon	Chris	Olivia	Jenny	Takaru
8	12	3	6	14	2	9	18

Based on the chart, Jaylan ate 4 times as many donuts as Olivia, which can be represented as 8 = 4 x 2.

Write three additional comparisons involving multiplication or division using the chart above. Write the three statements using words. Then write the equations that represent your statements.

Extended Constructed Response Exemplar Response

Big Ben's Bakery is a shop that sells cakes, cookies, donuts, and pastries. Answer each question and show your work.

1. The bakers at Big Ben's Bakery made 48 chocolate donuts, which is 6 times the number of cream-filled donuts they made.

    a. How many more chocolate donuts than cream-filled donuts did they make? Use an equation to show how you answered the question.

    48 = 6 x f f = 8; The bakers made 8 cream-filled donuts. (Students may use other equivalent equations to show their work.)

    48 - 8 = 40 The bakers made 40 more chocolate donuts than cream-filled donuts.

    b. How many dozens of chocolate donuts did they make?

    12 x d = 48

    d = 4

    The bakers made 4 dozen chocolate donuts.

2. Tess ordered three times as many cookies as Charles ordered and six times as many cookies as Shay ordered. The total number of cookies ordered by Tess is 36.

    a. How many cookies did Tess, Charles, and Shay order altogether? Use an equation to show how you solved the problem.

    Tess: 36 cookies

    Charles: $36 \div 3 = 12$ *or* $\frac{1}{3} \times 36 = 12$

    Shay: $36 \div 6 = 6$ *or* $\frac{1}{6} \times 36 = 6$

    36 + 12 + 6 = 54 They ordered 54 cookies altogether.

    ***Note: Students may use other equivalent equations to show their work.*

    b. How many more cookies did Tess order than Charles and Shay together?

    36 - (12+6)

    36 – 18

    18

    Tess ordered 18 more cookies than Charles and Shay together.

    ***Note: Correct answers based on incorrect work in Part a should be given credit.*

3. Each year, the bakery has a donut-eating contest to see who can eat the most donuts. The chart below shows how many donuts each person ate during the contest.

Jaylan	Evie	Jake	Amon	Chris	Olivia	Jenny	Takaru
8	12	3	6	14	2	9	18

Based on the chart, Jaylan ate 4 times as many donuts as Olivia, which can be represented as 8 = 4 x 2.

Write three additional comparisons involving multiplication or division using the chart above. Write the three statements using words. Then write the equations that represent your statements.

Answers will vary.

Some examples are:

- *Chris ate 7 times as many donuts as Olivia.* *7 x 2 = 14*
- *Evie ate 4 times as many donuts as Jake.* *12 = 4 x 3*
- *Takaru ate 2 times as many as donuts Jenny.* *9 x 2 = 18*
- *Jake ate 3 times fewer donuts than Jenny.* *9 ÷ 3 = 3*

School Store (ECR)

Overview

Students will solve word problems about sales at the school store involving the four operations.

Standards

Use the four operations with whole numbers to solve problems.

4.OA.A.2 Multiply or divide to solve word problems involving multiplicative comparison, e.g., using drawings or equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.

4.OA.A.3 Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies, including rounding.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are prerequisites for student success with this task's standards.

Grade Level Standards	The Following Standards Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Items
4.OA.A.2	• 3.OA.A.3	1. There are 6 drinks in a box. There are 6 times as many drinks total as there are in one box. What is the total number of drinks? a. There are 36 drinks total. 2. Cory has 36 pieces of candy. Laura has 5 times as many pieces of candy as Cory. How many pieces of candy does Laura have? a. Laura has 180 pieces of candy. 3. http://www.illustrativemathematics.org/illustrations/263	• http://www.illustrativemathematics.org/illustrations/344 • http://www.illustrativemathematics.org/illustrations/365 • http://www.illustrativemathematics.org/illustrations/262 • http://learnzillion.com/lessonsets/615-solve-word-problems-using-multiplicative-comparisons
4.OA.A.3	• 3.OA.D.8 • 4.NBT.A.3	1. Cai was given $50 for her birthday. She added money that she had saved from her allowance to have a total of $80. If Cai receives $2 per week for her allowance, how many weeks did Cai save her allowance to have a total of $80? a. She saved her allowance for 15 weeks. 2. http://www.illustrativemathematics.org/illustrations/876 3. http://www.illustrativemathematics.org/illustrations/1289	• http://www.illustrativemathematics.org/illustrations/13 • http://www.illustrativemathematics.org/illustrations/1301 • http://www.illustrativemathematics.org/illustrations/1445 • http://learnzillion.com/lessonsets/415-solve-multistep-word-problems-using-the-four-operations

After the Task

For problem 2, students may round the answer up for the number of pencil boxes Mr. Green could buy. Have students check their work by multiplying the number of boxes they said could be bought and comparing their answer to the amount of money Mr. Green had to spend. Have students discuss why the answer they obtained is too much. Then have them figure out the greatest number of boxes Mr. Green can buy.

For problem 3, students may have difficulty with the multistep problem. Have students write down all of the information they know. Then have students identify what the question is asking them to find. If needed, have students organize the given information with a chart. Then ask students to discuss how they can find the missing amount. Have students think about smaller problems, for example, “James has $20. His mom gave him $5. His dad gave him the rest. How much did his dad give him?” to think about the operations needed to solve problem 3.

Student Extended Constructed Response

1. East Elementary School has had a school store for 5 years. West Elementary School has had a school store for eight times as many years as East Elementary School. How many years has West Elementary School had a school store? Show how you found your answer using an equation with a symbol to represent the unknown number.

   The prices for two of the items in the school store for each year are listed below. Use the table to answer questions 2 and 3.

Year	Pencil Box Price	Pack of Pencils Price
2010	$2.00	$1.00
2011	$2.50	$1.25
2012	$3.00	$1.50
2013	$3.50	$1.75

2. Mr. Green had $55.00 to spend in 2010. He bought 4 packs of pencils. What is the greatest number of pencil boxes Mr. Green was able to buy in 2010? Show your work or explain your reasoning.

3. The school store collected a total of $1,371 by selling pencil boxes in the years 2011 through 2013. In 2011, the amount collected for pencil boxes was $670. In 2013, the amount collected for pencil boxes was $119. How many pencil boxes were sold in 2012? Explain your reasoning or show how you found your answer.

Extended Constructed Response Exemplar Response

1. East Elementary School has had a school store for 5 years. West Elementary School has had a school store for eight times longer than East Elementary School. How many years has West Elementary School had a school store? Show how you found your answer using an equation with a symbol to represent the unknown number.

   $8 \times 5 = \square$

   $40 = \square$

   West Elementary School has had a school store for 40 years.

   The prices for two of the items in the school store for each year are listed below. Use the table to answer questions 2 and 3.

Year	Pencil Box Price	Pack of Pencils Price
2010	$2.00	$1.00
2011	$2.50	$1.25
2012	$3.00	$1.50
2013	$3.50	$1.75

2. Mr. Green had $55.00 to spend in 2010. He bought 4 packs of pencils. What is the greatest number of pencil boxes Mr. Green was able to buy in 2010? Explain your reasoning.

   Mr. Green was able to buy 25 pencil boxes in 2010.

   Mr. Green bought 4 packs of pencils, which cost $4. There would be $51 dollars remaining to buy pencil boxes because $\$55 - \$4 = \$51$. *Then I divide 51 ÷ 2, which is 25 with a remainder of 1. This means that Mr. Green would be able to buy 25 pencil boxes. The remainder of 1 means that Mr. Green would not be able to buy another pencil box because he does not have enough money.*

3. The school store collected a total of $1,371 by selling pencil boxes in the years 2011 through 2013. In 2011, the amount collected for pencil boxes was $670. In 2013, the amount collected for pencil boxes was $119. How many pencil boxes were sold in 2012? Explain your reasoning or show how you found your answer.

   I added $670 + $119 for 2011 and 2013 and got $789. Next, I subtracted $789 from $1,371 to find out the amount of money collected for 2012. The amount of money collected in 2012 for pencil boxes was $582. Then I had to figure out how many pencil boxes were sold in 2012, so I divided $582 by 3 because the pencil boxes cost $3.00 in 2012, and got 194. So there were 194 pencil boxes sold in 2012.

Alien Contest (ECR)

Overview

Students will use knowledge of factors and multiples to determine if certain alien creatures can participate in the contest.

Standard

Gain familiarity with factors and multiples.

4.OA.B.4 Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.

Prior to the Task

Standards Preparation: The material in the chart below illustrates the standards and sample tasks that are prerequisites for student success with this task's standards.

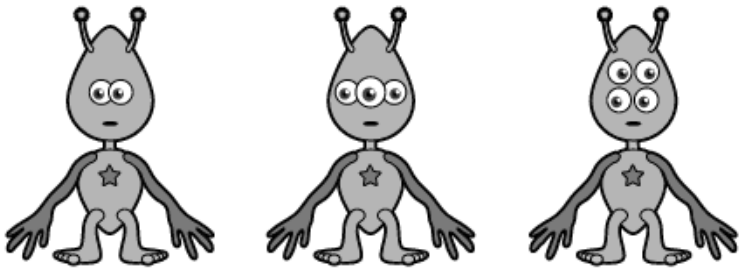
Grade Level Standard	The Following Standard Will Prepare Them	Items to Check for Task Readiness	Sample Remediation Item
4.OA.B.4	• 3.OA.C.7	1. What are the factors of 96? a. 1, 2, 3, 4, 6, 8, 12, 16, 24, 32, 48, 96 2. Is 74 a multiple of 4? a. No 3. http://www.illustrativemathematics.org/illustrations/938	• http://learnzillion.com/lessonsets/123-find-and-understand-factors-and-determine-if-a-number-is-a-multiple-of-a-given-number-for-whole-numbers-0100

After the Task

Students who need additional practice with understanding factors and multiples may provide responses that show various operations to arrive at the correct answer. Provide additional practice where students use factors and multiples to answer questions. One sample problem is "Penelope brought 30 cupcakes to share with her friends. If Penelope does not keep any for herself, with how many friends could she share the cupcakes?" This sample problem will have multiple answers. Have students explain how they know their answers are correct.

Student Extended Constructed Response

The two-eyed space creatures, three-eyed space creatures, and four-eyed space creatures are having a contest to create a group with 24 total eyes.



1. How many two-eyed creatures are needed to make a group with 24 total eyes? How many three-eyed creatures are needed to make a group of 24 total eyes? How many four-eyed creatures are needed to make a group with 24 total eyes? Complete the chart below.

Creature Type	Number of Creatures
Two-eyed	
Three-eyed	
Four-eyed	

2. The creatures decide to have a contest to create a group with 40 total eyes. Only creatures that can form a group of 40 total eyes can participate, and groups can only have the same type of creatures (all two-eyed, three-eyed, or four-eyed). Can all three groups listed in question 1 participate in this contest? Tell how you know.

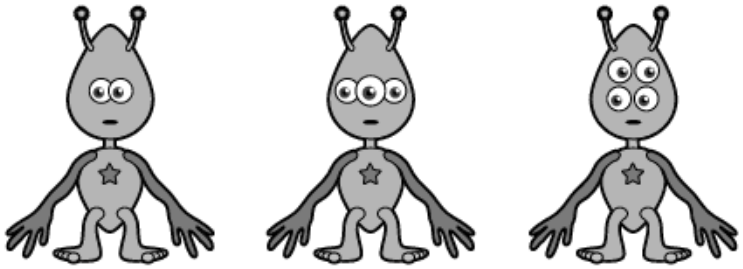
3. If other creature types decide to join in the contest described in question 2, which of the following creature groups could participate: one-eyed creatures, five-eyed creatures, seven-eyed creatures, or eight-eyed creatures? Explain your thinking.

4. The three-eyed creatures tell the six-eyed creatures that they cannot participate in the contest described in question 2. Is this true? Explain your thinking.

Adapted from: "The Contest" Item #43081-43804 http://sampleitems.smarterbalanced.org/itempreview/sbac/index.htm

Extended Constructed Response Exemplar Response

The two-eyed space creatures, three-eyed space creatures, and four-eyed space creatures are having a contest to create a group with 24 total eyes.



1. How many two-eyed creatures are needed to make a group with 24 total eyes? How many three-eyed creatures are needed to make a group of 24 total eyes? How many four-eyed creatures are needed to make a group with 24 total eyes? Complete the chart below.

Creature Type	Number of Creatures
Two-eyed	*12*
Three-eyed	*8*
Four-eyed	*6*

2. The creatures decide to have a contest to create a group with 40 total eyes. Only creatures that can form a group of 40 total eyes can participate, and groups can only have the same type of creatures (all two-eyed, three-eyed, or four-eyed). Can all three groups listed in question 1 participate in this contest? Tell how you know.

   No, the three-eyed creatures could not have a group to make a group with 40 total eyes. The number of eyes in groups of three-eyed creatures would be multiples of 3 (for example, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, etc.). They could create a group with a total of 39 eyes or 42 eyes, but not a group with 40 total eyes. 40 is not a multiple of 3.

3. If other creature types decide to join in the contest described in question 2, which of the following creature groups could participate: one-eyed creatures, five-eyed creatures, seven-eyed creatures, or eight-eyed creatures? Explain your thinking.

   The one-eyed, five-eyed, and eight-eyed creatures can participate because 1, 5, and 8 are factors of 40. The seven-eyed creatures could not participate because 7 is not a factor of 40.

4. The three-eyed creatures tell the six-eyed creatures that they cannot participate in the contest described in question 2. Is this true? Explain your thinking.

   Yes, it is true. The number of eyes in groups of six-eyed creatures would be multiples of 6 (for example, 6, 12, 18, 24, 30, 36, 42, etc.). They could have a group with a total of 36 eyes or 42 eyes. 40 is not a multiple of 6.