Unit 3 Review/Test Name _____ Date _____

1 For numbers 1a–1d, without multiplying, use <, >, or = to indicate the product will compare with the factor. DoK: Level 2

1a. $\frac{13}{4} \cdot \frac{5}{8} = x$ x (<) $\frac{13}{4}$ x (>) $\frac{5}{8}$

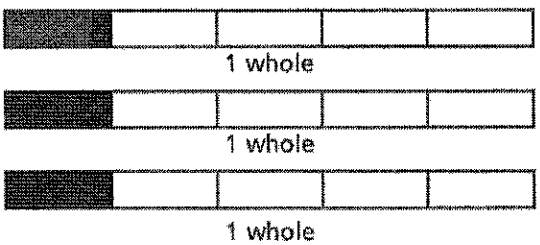
1b. $\frac{4}{3} \cdot 6 = x$ x (>) $\frac{4}{3}$ x (>) 6

1c. $\frac{2}{5} \cdot \frac{1}{7} = x$ x (<) $\frac{2}{5}$ x (<) $\frac{1}{7}$

1d. $\frac{5}{8} \cdot \frac{7}{7} = x$ x (=) $\frac{5}{8}$ x (<) $\frac{7}{7}$

2 Three packages of trail mix are shared equally between Alycia and her four classmates. DoK: Level 1

Part A Each bar represents one package of trail mix. Shade the bars to show how much of each package of trail mix one person will get.



Part B How much of one package of trail mix will each person get? Write and solve an equation.

$\frac{3}{5}$ of one package of trail mix; Equations may vary. Possible equation: $x = 3 \div 5$

3 Mr. Walker must equally divide 12 loaves of bread between seven platters. How many loaves of bread are placed on each platter? Write and solve an equation. DoK: Level 1

$1\frac{5}{7}$ loaves of bread; Equations may vary. Possible equation: $x = 12 \div 7$

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4. Elin has $\frac{1}{3}$ hour to warm up for her gymnastics meet. She must complete each of 6 different stretches. She spends an equal amount of time on each type of stretch and she does not take a break. How long, in hours, does she spend on each type of stretch? Write and solve an equation. DoK: Level 1

$\frac{1}{18}$ hour or 3 minutes 20 seconds; Equations may vary. Possible equation: $x = \frac{1}{3} \div 6$

5. Ava has two frogs. This is $\frac{1}{3}$ the number of frogs that Heather has. How many frogs does Heather have? Draw a diagram to represent the division. Then write and solve an equation. DoK: Level 2

6 frogs; Equations may vary. Possible equation: $x = 2 \div \frac{1}{3}$; Check students' drawings.

6. For a snack, Miss Johnson gives her class graham crackers. She has a package of 20 graham crackers to share equally among eight students. How many graham crackers should each student receive? Explain how you found your answer. DoK: Level 1

$2\frac{1}{2}$ graham crackers; Possible explanation: Dividing 20 crackers among 8 students can be found by solving $20 \div 8 = x$. $\frac{20}{8} = \frac{5}{2} = 2\frac{1}{2}$

7. For numbers 7a–7d, select True or False for each the product. DoK: Level 1

7a. $\frac{3}{5} \cdot \frac{2}{7} = \frac{21}{10}$	○ True	● False
7b. $\frac{2}{9} \cdot \frac{5}{3} = \frac{10}{27}$	● True	○ False
7c. $\frac{7}{8} \cdot \frac{5}{9} = \frac{35}{72}$	● True	○ False
7d. $\frac{1}{2} \cdot \frac{3}{5} = \frac{4}{10}$	○ True	● False

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7 Juan needs to measure six cups of flour for a recipe. He only has a $\frac{1}{4}$ measuring cup. How many times must he fill the measuring cup to get six cups of flour? DoK: Level 2

For numbers 8a–8e, choose Yes or No to tell whether the equation can be used to solve the word problem shown above.

8a. $6 \cdot \frac{1}{4} = \square$ ○ Yes ● No

8b. $6 \cdot 4 = \square$ ● Yes ○ No

8c. $1 \cdot \frac{4}{6} = \square$ ○ Yes ● No

8d. $6 \div \frac{1}{4} = \square$ ● Yes ○ No

8e. $6 \div 4 = \square$ ○ Yes ● No

9 Ben has a piece of cord that is 40 feet long. He wants to cut the cord into pieces to tie up the tomato plants in his garden. How many pieces can he cut if each piece is $\frac{1}{2}$ foot long? Draw a diagram to represent the division. Then write and solve an equation to find the solution. DoK: Level 2

$40 \div \frac{1}{2} = 40 \cdot 2 = 80$ pieces; Check students' drawings.

10 Of the fifth grade students, $\frac{15}{20}$ went to the book fair. Of the students who went to the book fair, $\frac{12}{16}$ bought at least one book. What fraction of fifth grade students bought at least one book? Show your work. DoK: Level 1

$\frac{9}{16}$; $\frac{\overset{3}{\cancel{12}}}{\underset{4}{\cancel{16}}} \cdot \frac{\overset{3}{\cancel{15}}}{\underset{4}{\cancel{20}}} = \frac{3}{4} \cdot \frac{3}{4} = \frac{9}{16}$

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11 Marie plants flowers in a planter that is $1\frac{1}{2}$ feet long and $1\frac{2}{3}$ feet wide. She plans to cover the entire area with fertilizer. How much area will she need to spread with fertilizer?

DoK: Level 1

$2\frac{1}{2}$ square feet

12 Of the coins in Simone's collection, $\frac{13}{25}$ are quarters. Of these quarters, $\frac{2}{3}$ are state quarters. What fraction of Simone's coins are state quarters? DoK: Level 1

$\frac{13}{25} \cdot \frac{2}{3} = \frac{13 \cdot 2}{25 \cdot 3} = \frac{26}{75}$

13 A square *Do Not Enter* sign has a height and width of $2\frac{1}{2}$ feet.

Part A DoK: Level 2

Will the area of the sign be greater than or less than $2\frac{1}{2}$ square feet? Explain how you know.

Greater than; Possible explanation: Multiplying a factor by a number greater than 1 results in a product greater than the factor. To find the area, multiply $2\frac{1}{2} \cdot 2\frac{1}{2}$. Since $2\frac{1}{2}$ is greater than 1, the product must be greater than $2\frac{1}{2}$ square feet.

Part B

What is the area of the sign? Show your work.

$6\frac{1}{4}$ square feet; $2\frac{1}{2} \cdot 2\frac{1}{2} = \frac{5}{2} \cdot \frac{5}{2} = \frac{5 \cdot 5}{2 \cdot 2} = \frac{25}{4} = 6\frac{1}{4}$

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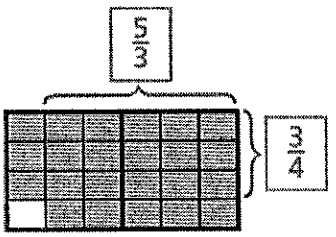
14 Pavel drew the area model to help him solve a multiplication problem.



Part A DoK: Level 2

Use the numbers from the cards below to complete the area model.

$\frac{4}{3}$ $\frac{5}{3}$ $\frac{3}{5}$ $\frac{3}{4}$

Part B

What is the answer to the problem Pavel was working on? Show your work.

$\frac{5}{3} \cdot \frac{3}{4} = \frac{5}{\cancel{3}_1} \cdot \frac{\cancel{3}^1}{4} = \frac{5}{4}$ or $1\frac{1}{4}$

Without multiplying, choose the symbol from the box to compare the product on the left with the factor shown on the right. DoK: Level 2

15 $\frac{4}{5} \cdot \frac{3}{8}$ [(<) > =] $\frac{4}{5}$

16 $\frac{8}{6} \cdot \frac{2}{3}$ [< (>) =] $\frac{2}{3}$

17 $\frac{5}{5} \cdot \frac{3}{8}$ [< > (=)] $\frac{3}{8}$

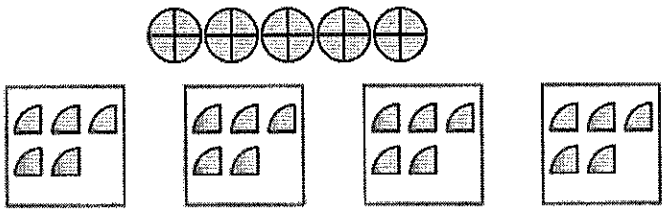
18 Without multiplying, classify each product as being less than $\frac{2}{3}$, equal to $\frac{2}{3}$, or greater than $\frac{2}{3}$. Write the letter of each expression in the correct box. DoK: Level 2

A $\frac{2}{3} \cdot \frac{1}{5}$ B $\frac{2}{3} \cdot \frac{8}{5}$ C $\frac{2}{3} \cdot \frac{9}{9}$ D $\frac{2}{3} \cdot \frac{6}{1}$ E $\frac{2}{3} \cdot \frac{8}{9}$ F $\frac{2}{3} \cdot 2$

Less Than $\frac{2}{3}$	Equal to $\frac{2}{3}$	Greater Than $\frac{2}{3}$
A, E	C	B, D, F

Unit 3 Review/Test Name _____ Date _____

19 Hannah wants to divide five oranges equally among four children. She drew a model to find 5 ÷ 4. Is Hannah's model correct? Explain your reasoning using words, numbers, and pictures. DoK: Level 3



Possible explanation: Hannah's model is correct because it shows five wholes divided into four equal groups. In order to divide each whole, the models were divided into fourths. Each child would get $1\frac{1}{4}$ oranges.

20 Axel paints his doghouse using leftover paint. He has two identical walls and two identical sections of roof unpainted. The dimensions of the rectangular wall and roof sections are listed in the table. DoK: Level 3

Part A

Complete the table by writing the area of one wall and one roof section.

Part	Length (ft)	Width (ft)	Total Area (ft^2)
Wall	$1\frac{1}{3}$	$2\frac{1}{6}$	$2\frac{8}{9}$
Roof	$1\frac{1}{2}$	$2\frac{1}{12}$	$3\frac{1}{8}$

Part B

Axel has enough blue paint to cover six square feet. For which part of the doghouse will Axel have enough blue paint–two walls or two roof sections?

two walls

Unit 3 Performance Task

Name _____ Date _____

How Many Nuts? DoK: Level 3

Lexi is packaging 2-pound mixtures of nuts in jars. In each mixture, the fraction of the total weight is the same for each type of nut. For example, in a mixture of 3 types of nuts, each type is $\frac{1}{3}$ of the total weight. The table shows the amount of each nut Lexi has.

Nut	Amount (in lb)
Almond	12
Cashew	10
Peanut	18
Pecan	14
Walnut	8
Hazelnut	3

1. Make two 2-pound mixtures of nuts. Each mixture must have at least 3 different types of nuts. Find the amount needed of each nut to make one jar of each mixture.

Students should divide 2 pounds by 3, 4, 5, or 6 different types of nuts. Possible answer: $\frac{2}{3}$ lb each of almond, cashew, and peanut; $\frac{1}{2}$ lb each of walnut, hazelnut, pecan, and almond

2. Does one of your mixtures allow Lexi to package more jars of nut mixture than the other? Show work to support your answer.

Students should recognize that the number of jars of a mixture that can be packaged is limited by the fewest number of jars that can be made from any nut in the mixture and either divides, uses a combination of division and multiplication, or other operations to find the number of jars for that mixture. Possible answer: Yes; Lexi can package 15 jars ($10 \div \frac{2}{3} = 15$) from the 3-nut mixture or 6 jars ($3 \div \frac{1}{2} = 6$) from the 4-nut mixture.

3. What should Lexi consider if she wants to make the greatest number of jars of nuts with the amounts of nuts shown in the table? Explain your reasoning.

Possible explanation: She should consider the number of pounds of each type of nut and how many different types of nuts are used in each mixture.

Unit 3 Performance Task

Name _____ Date _____

The table shows the amount of each nut Lexi has and the price she pays for one pound of each nut.

Nut	Amount (in lb)	Price ($ per lb)
Almond	12	6
Cashew	10	9
Peanut	18	3
Pecan	14	12
Walnut	8	9
Hazelnut	3	6

4. Is one of your mixtures more expensive to make than the other? Show work to support your answer.

Students should multiply the price per pound of each type of nut in a mixture by the fraction of a pound of that nut in the mixture. The prices for each type of nut in a mixture should be added and the total prices for each mixture should be compared.

5. How could Lexi lower the cost of making one of your mixtures? Would this change the greatest number of jars of the mixture that Lexi could package? Give an example to support your answer.

Students should recognize that the cost of making a mixture is affected by the cost of each type of nut in a mixture and/or the number of types of nuts in a mixture. Possible answers: For the 3-nut mixture, substitute hazelnuts for cashews. $(\frac{2}{3})(\$6) = \$4$. Lexi only has 3 pounds of hazelnuts, and $3 \div \frac{2}{3} = 4\frac{1}{2}$. So, Lexi could only package 4 jars of the mixture instead of 15.

6. Lexi wants to sell as many jars of 3-nut mixtures as possible. What strategy should she use? Explain your reasoning.

Possible answer: Lexi should make as many less expensive mixtures as possible. This way, she can sell the jars at a lower cost, and customers will buy more.