Broward County Public Schools

C A R E
Curriculum Assessment Remediation Enrichment

6th grade
Mathematics CARE Package for Test #3

Domain	The Number System
Cluster	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
Standards	**MAFS.6.NS.1.1** Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. *For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?* **MAFS.6.NS.2.4** Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor. *For example, express 36 + 8 as 4 (9 + 2).*

CURRICULUM

Student Problem-Solving (SPS)

The SPS site provides interactive activities for students. This wiki is a work in progress and will be updated regularly.

Implementation Suggestion

Students may work independently or in small groups of 2-3 to complete the task (**ESE Strategy – Provide peer assistance; ESOL E4 – Peer Pair**). Allow 15-20 minutes to complete this task. Students can meet with other groups to share their results. (**ESOL E6 – Think/Pair/Share**). Then, review as a class-wide discussion.

Differentiation

Some students may benefit from working with a partner to complete the task. Encourage students who completed the performance task early to share their models and how they arrived at the solutions with a partner. Some students may benefit from using manipulatives, such as fraction bars.

Mathematical Practice #1- Make sense of problems and persevere in solving them.

Students make sense of and solve a fraction division problem with a remainder; they asked to make a diagram to represent the problem, and relate this representation to the context of the problem. Students are asked to explain how they check their answers to the problems using a different method.

Mathematical Practice #2- Reason abstractly and quantitatively

Students are reasoning quantitatively by creating a coherent representation of the problem; considering the units involved; and attending to the meaning of quantities, and not just how to compute them.

Performance Task
(MAFS.6.NS.1.1)
SHARE MY CANDY

Jason has $3\frac{1}{2}$ candy bars. He wants to share the candy bars with his friends. He gives as many friends as possible $\frac{3}{4}$ of a candy bar. He keeps the rest for himself.

PART A: How many friends can he give $\frac{3}{4}$ of a candy bar to? Draw a model to solve the problem. Write your answer in a complete sentence.

| F1 | F1 | F1 | F2 | | F2 | F2 | F3 | F3 | | F3 | F4 | F4 | F4 | | | |
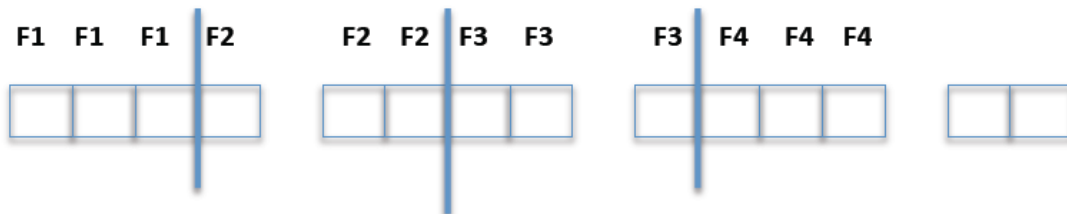
ANSWER SENTENCE: *He can give 4 friends ¾ of a candy bar.*

PART B: How much of the candy bar will Jason keep for himself? Show your work and write your answer in a complete sentence.

From the picture above, Jason has $\frac{2}{4}$ or $\frac{1}{2}$ left. That is not enough to share with another friend because it is less than $\frac{3}{4}$.

ANSWER SENTENCE: *Jason has $\frac{2}{4}$ or $\frac{1}{2}$ left.*

Adapted from "Share My Candy" NYC Department of Education http://schools.nyc.gov

PART C: Explain your reasoning for parts A and B.

Jason wants to share $3\frac{1}{2}$ candy bars with his friends. I can drew $3\frac{1}{2}$ candy bars and then split each whole one into fourths because he wants to give three-fourths to each friend.

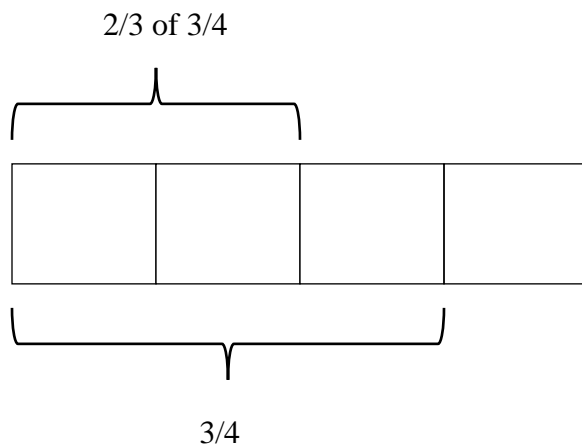PART D: Use division to model the problem. Show your work.

$$3\frac{1}{2} \div \frac{3}{4} = \frac{7}{2} \div \frac{3}{4} = \frac{7}{2} \times \frac{4}{3} = \frac{28}{6} = \frac{14}{3} = 4\frac{2}{3}$$

He can give ¾ of the candy bar to 4 friends. He will have some left over.

PART E: Explain how your answer from PART D is equivalent to your answers from PARTS A and B.

$$3\frac{1}{2} \div \frac{3}{4} = 4\frac{2}{3}$$

4 is the number of friends he can give three-fourths of the candy bar to. In Part B, I found that he had ½ of a candy bar left. In part D, there is 2/3 left. The fraction he gives to each person is ¾ and 2/3 of that   group is ½.

2/3 of 3/4

3/4

$$3\frac{1}{2} \div \frac{3}{4} = 4\frac{2}{3} \qquad \frac{2}{3} \; of \; \frac{3}{4} = \frac{2}{3} \times \frac{3}{4} = \frac{2}{4} = \frac{1}{2}$$

Adapted from "Share My Candy" NYC Department of Education http://schools.nyc.gov

The Mini-MAF includes standards MAFS.6.NS.1.1, MAFS.6.NS.2.4. Use the following table to assist in remediation efforts.

Questions	Standards	Module/Lesson
1-6	MAFS.6.NS.1.1	Lesson 4.2 Dividing Fractions Lesson 4.3 Dividing Mixed Numbers Lesson 4.4 Solving Multistep Problems with Fractions and Numbers
7-10	MAFS.6.NS.2.4	Lesson 4.1 Applying GCF and LCM to Fraction Operations

6th Grade Mini-MAFS 3 (To be given after Module 4)
MAFS.6.NS.1.1, MAFS.6.NS.2.4

Multiple Choice
Identify the choice that best completes the statement or answers the question.

____ **1** The area of a rectangular city park is $\frac{25}{54}$ square miles. The length of the park is $\frac{5}{9}$ mile. What is the width, in miles, of the park?

A. $\frac{4}{9}$

B. $\frac{5}{6}$

C. $1\frac{1}{54}$

D. $1\frac{1}{5}$

____ **2** What is $\frac{7}{8} \div 14$?

A. $\frac{1}{16}$

B. $\frac{4}{49}$

C. $12\frac{1}{4}$

D. 16

____ **3** One serving of trail mix is $\frac{3}{8}$ of a pound. How many servings are in $\frac{1}{4}$ of a pound?

A. $\frac{3}{32}$

B. $\frac{2}{3}$

C. $1\frac{1}{2}$

D. 3

____ **4** Benito has a 4-gallon bucket that he wants to fill with sand. He is using a scoop that holds $\frac{2}{3}$ gallon of sand. How many scoops of sand will it take to fill the bucket?

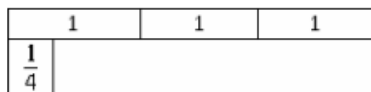| 1			1			1			1		
$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$	$\frac{1}{3}$
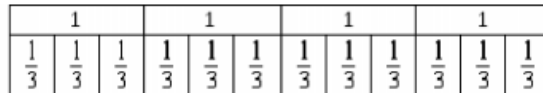
A. 3

B. 6

C. 8

D. 12

____ **5** Brenda has 3 yards of fabric to use on an arts and crafts project. She needs to cut the fabric into pieces that are each $\frac{1}{4}$ of a yard long. How many pieces of fabric can Brenda cut?

1	1	1
$\frac{1}{4}$		

A. 3

B. 4

C. 12

D. 15

___ **6** Which process do you use to find $\frac{4}{7} \div 5\frac{1}{6}$?

A. Divide $\frac{4}{7} \div 5$ and divide $\frac{4}{7} \div \frac{1}{6}$, then find the sum of those quotients.

B. Divide $\frac{4}{7} \div 5$ and divide $\frac{4}{7} \div \frac{1}{6}$, then find the product of those quotients.

C. Rewrite $5\frac{1}{6}$ as an improper fraction, find its reciprocal, and multiply it by $\frac{4}{7}$.

D. Rewrite $5\frac{1}{6}$ as an improper fraction, and then multiply by the reciprocal of $\frac{4}{7}$.

___ **7** What is the product of $\frac{2}{5}$ and $\frac{3}{6}$, in simplest form?

A. $\frac{6}{12}$

B. $\frac{3}{5}$

C. $\frac{7}{12}$

D. $\frac{1}{5}$

___ **8** Carmen and Melanie are baking. Carmen needs $\frac{5}{6}$ cups of flour and Melanie needs $\frac{1}{3}$ cups of flour. How many cups of flour do Carmen and Melanie need together?

A. $\frac{8}{6}$

B. $1\frac{4}{12}$

C. $1\frac{3}{6}$

D. $1\frac{1}{6}$

___ **9** Caroline used $3\frac{3}{4}$ cups of butter for baking. The amount of sugar she used was $\frac{1}{3}$ of the amount of butter she used. How much sugar did she used?

A. $1\frac{1}{4}$ cups

B. $1\frac{1}{3}$ cups

C. $2\frac{1}{2}$ cups

D. $3\frac{5}{12}$ cups

___ **10** Jayla brought $\frac{5}{9}$ of a pound of cherries to school. Joseph brought $\frac{4}{15}$ of a pound of cherries to school. Jayla used the expression below to find the difference in the number of pounds of cherries she and Joseph brought to school.

$$\frac{5}{9} - \frac{4}{15}$$

Which expression shows one way to solve the expression Jayla used above?

A. $\frac{5-4}{9-15}$

B. $\frac{5}{45} - \frac{4}{45}$

C. $\frac{5-4}{9 \times 15}$

D. $\frac{25}{45} - \frac{12}{45}$

6th Grade Mini-MAFS 3 (To be given after Module 4)
MAFS.6.NS.1.1, MAFS.6.NS.2.4
Answer Section

MULTIPLE CHOICE

1 ANS: B   PTS: 1   STA: MAFS.6.NS.1.1
     KEY: DOK3

2 ANS: A   PTS: 1   STA: MAFS.6.NS.1.1
     MSC: DOK 1

3 ANS: B   PTS: 1   STA: MAFS.6.NS.1.1
     MSC: DOK 2

4 ANS: B   PTS: 1   STA: MAFS.6.NS.1.1
     MSC: DOK 2

5 ANS: C   PTS: 1   STA: MAFS.6.NS.1.1
     MSC: DOK 2

6 ANS: C   PTS: 1   STA: MAFS.6.NS.1.1
     MSC: DOK 3

7 ANS: D   PTS: 1   STA: MAFS.6.NS.2.4
     MSC: DOK1

8 ANS: D   PTS: 1   STA: MAFS.6.NS.2.4
     MSC: DOK2

9 ANS: A   PTS: 1   NAT: MAFS.6.NS.2.4
     MSC: DOK2

10 ANS: D   PTS: 1   NAT: MAFS.6.NS.2.4
     MSC: DOK2

REMEDIATION / RETEACH

Academic Vocabulary: Activate prior knowledge (**ESE Strategy – Pre-teach Vocabulary;**
ESOL G1-Activating Prior Knowledge) by reviewing key terms and concepts.
fraction, numerator, denominator, greatest common factor (GCF), least common multiple
(LCM), quotient, remainder, divisor, dividend, mixed number, reciprocal

Sample Questions that Elicit Thinking
1) How does division of fractions relate to multiplication of fractions?
2) Why is the quotient greater than the dividend when dividing by a value less than one?
3) Why does the process of invert and multiply work when dividing fractions?
4) When I divide a fraction by a fraction what do the dividend, quotient and divisor represent?

Think, Pair, Share

Have students jot down their own responses to questions, then discuss with a partner, and then
discuss as a whole class. (**ESOL E6 Think/Pair/Share**)

Go over academic vocabulary and/or use vocabulary graphic organizer. (**ESOL D9 Vocabulary
Banks**)

Common Misconceptions:
Some students may find it difficult to understand that dividing by a number less than one results in a quotient that is greater than the dividend. Using models and helping them interpret what the quotient represents can help clear up this misunderstanding. Computation with fractions is best understood when it builds upon the familiar understandings of whole numbers and is paired with visual representations. Solve a simpler problem with whole numbers, and then use the same steps to solve a fraction divided by a fraction. Looking at the problem through the lens of "How many groups?" or "How many in each group?" helps visualize what is being sought.

Most of students' fraction modeling experience has probably been with dividing one whole into fractional parts. When dividing fractions, they are expected to partition fractions and mixed numbers into groups of fractional size.

Resources	Description
Models of Fraction Division	Students are asked to explain the relationship between a fraction division word problem and either a visual model or an equation.
Visual Fractions Divide Fractions	Divide Fractions is an interactive website where students are presented with a model of fraction division and are asked to identify the dividend, the divisor, and the quotient. All quotients will be a whole number between 1 and 12. **(ESOL I 4: Digital Tools/Software) (ESE Accommodation- Use computer-assisted instruction)**
Visual Fractions Divide Fractions-Strict	Divide Fractions-Strict is similar to the previous program DIVIDE FRACTIONS except that the divisor may be larger than the dividend and the quotient may be a mixed number. **(ESOL I 4: Digital Tools/Software) (ESE Accommodation- Use computer-assisted instruction)**
Dividing Fractions Reteach	Reteach instruction and exercises for reaching all learners.
Dividing Fractions Success for ELLs	Instruction and exercises to meet the needs of ELL students.
Dividing Mixed Numbers Reteach	Reteach instruction and exercises for reaching all learners.
Dividing Mixed Numbers for ELLs	Instruction and exercises to meet the needs of ELL students.
Videos Dividing Fractions (Finding Reciprocals) Dividing Fractions Dividing Mixed Numbers Dividing Mixed Numbers (Area) Solving Problems with Fractions and Mixed Numbers	Video instruction and examples to support MAFS.6.NS.1.1

Continued Fractions

Write the continued fraction as an improper fraction:

1. $1 + \dfrac{1}{1+\dfrac{1}{1+\frac{1}{2}}}$ $\dfrac{8}{5}$

2. $1 + \dfrac{1}{1+\dfrac{1}{1+\frac{1}{3}}}$ $\dfrac{11}{7}$

3. $1 + \dfrac{1}{1+\dfrac{1}{1+\dfrac{1}{1+\frac{1}{5}}}}$ $\dfrac{28}{17}$

4. $2 + \dfrac{1}{3+\dfrac{1}{2+\frac{1}{2}}}$ $\dfrac{39}{17}$

To change a continued fraction to an improper fraction, follow the example:

$$\frac{72}{17} = 4 + \frac{4}{17}$$

$$\frac{72}{17} = 4 + \frac{1}{\frac{17}{4}}$$

$$\frac{72}{17} = 4 + \frac{1}{4 + \frac{1}{4}}$$ Each fraction must have a numerator of 1.

Write the improper fraction as a continued fraction:

5. $\frac{25}{13}$ 6. $\frac{23}{3}$

$$1 + \frac{1}{1 + \frac{1}{12}}$$ $$7 + \frac{1}{1 + \frac{1}{2}}$$

7. $\frac{17}{5}$ 8. $\frac{48}{11}$

$$3 + \frac{1}{2 + \frac{1}{2}}$$ $$4 + \frac{1}{2 + \frac{1}{1 + \frac{1}{3}}}$$

Name: _____ Date: _____ Class: _____

Performance Task
(MAFS.6.NS.1.1)
SHARE MY CANDY

Jason has $3\frac{1}{2}$ candy bars. He wants to share the candy bars with his friends. He gives as many friends as possible $\frac{3}{4}$ of a candy bar. He keeps the rest for himself.

PART A: How many friends can he give $\frac{3}{4}$ of a candy bar to? Draw a model to solve the problem. Write your answer in a complete sentence.

ANSWER SENTENCE: _____

PART B: How much of the candy bar will Jason keep for himself? Show your work and write your answer in a complete sentence.

ANSWER SENTENCE: _____

PART C: Explain your reasoning for parts A and B.

_____

_____

_____

_____

_____

_____

PART D: Use division to model the problem. Show your work.

PART E: Explain how your answer from PART D is equivalent to your answers from PARTS A and B.

Share My Candy

Student Name: _____   Date: _____

Teacher Name: _____   Class: _____

Category	4	3	2	1	0	Score
Presentation Neatness and Organization	The work is presented in a neat and clear manner in an organized fashion that is easy to read.	The work is presented in a neat and clear manner in an organized fashion that is mostly easy to read, but lacks some labels.	The work is presented in an organized fashion, but may be hard to read at times.	The work appears sloppy and unorganized. It is hard to know what information goes together.	No attempt was made to organize the problem.	
Implementation Strategy/ Procedures	Efficient and effective strategies are implemented in solving this problem.	Efficient and effective strategies are partially implemented in solving this problem.	A correct strategy was attempted, but improperly executed.	An ineffective or incorrect strategy was implemented.	No attempt was made to solve the problem.	
Precision Mathematical Accuracy	All steps and solutions are accurate and labeled.	Most steps and solutions are accurate and labeled.	Some steps and solutions are accurate and labeled.	Most steps and solutions are inaccurate and/or mislabeled.	No attempt was made to show work.	
Communication Explanation	Explanation is clear and detailed, and includes critical components needed to solve the problem.	Explanation is clear, but a critical component of the problem is missing.	Explanation is a little too difficult to follow or lacks some critical components needed to solve the problem.	Explanation is difficult to understand and is missing several components needed to solve the problem.	No attempt was made to explain the work.	
Solving Final Answer	The solutions make sense. The question is answered in a complete sentence.	The solution has a minor error, an incorrect label, an incomplete answer, or incomplete statement.	The solution contains a major error, no label, a partial answer, or an incomplete statement.	There is no solution, a wrong solution, or an inappropriate solution.	No attempt was made to answer the problem.	
					Total Pts/20	
				Total Points ÷ 5 ▶	Score/4	
				Score/4×25 ⟶	Score/100	

Name: _____   Date: _____ Class: _____

MAFS.6.NS.1.1

Enrichment

<u>**Continued Fractions**</u>

Write the continued fraction as an improper fraction:

1. $1 + \dfrac{1}{1 + \dfrac{1}{1 + \dfrac{1}{2}}}$

2. $1 + \dfrac{1}{1 + \dfrac{1}{1 + \dfrac{1}{3}}}$

3. $1 + \dfrac{1}{1 + \dfrac{1}{1 + \dfrac{1}{1 + \dfrac{1}{5}}}}$

4. . $2 + \dfrac{1}{3 + \dfrac{1}{2 + \dfrac{1}{2}}}$

Adapted from "Share My Candy" NYC Department of Education http://schools.nyc.gov

To change a continued fraction to an improper fraction, follow the example:

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$$\frac{72}{17} = 4 + \frac{1}{4 + \frac{1}{4}}$$ Each fraction must have a numerator of 1.

Write the improper fraction as a continued fraction:

5. $\frac{25}{13}$

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7. $\frac{48}{11}$

8. $\frac{22}{3}$