ADULT LEARNING ACADEMY

PRE-ALGEBRA WORKBOOK

UNIT 2: FRACTIONS

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MoHealthWINs

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Pre-Algebra Workbook

UNIT 2: FRACTIONS

LEARNING OBJECTIVES

1. **Understanding & Identification:**
   - ☐ Recognize proper fractions, improper fractions, and mixed numbers
   - ☐ Identify the numerator and denominator of fractions; understand how they relate to part and whole
   - ☐ Plot Fractions on a number line
2. **Conversions & Comparisons:**
   - ☐ Recognize and write equivalent fractions
   - ☐ Reduce fractions and simplify to lowest possible terms
   - ☐ Convert between improper fractions and mixed numbers
   - ☐ Rewrite unlike fractions, using the lowest common denominator (LCD)
   - ☐ Describe, order and compare fractions
3. **Operations with Like and Unlike Fractions:**
   - ☐ Add fractions
   - ☐ Subtract Fractions
   - ☐ Multiply Fractions
   - ☐ Divide Fractions
   - ☐ Follow order of operations rules when performing calculations with fractions
4. **Operations with Mixed Numbers:**
   - ☐ Add mixed numbers
   - ☐ Subtract mixed numbers
   - ☐ Multiply mixed numbers
   - ☐ Divide mixed numbers
   - ☐ Follow order of operations rules when performing operations involving mixed number
5. **Word Problems:**
   - ☐ Solve basic word problems that use fractions and mixed numbers, including applications to the healthcare industry, and those involving area and perimeter

Topic	Website	Videos	Exercises
Understanding Fractions	www.khanacademy.org	Numerator, Denominator of a Fraction	Recognizing Fractions 0.5
		Identifying Fraction Parts	Recognizing Fractions
			Fractions on the Number line 1
			Fraction Word Problems 1
Equivalent Fractions	www.khanacademy.org	Equivalent Fractions	Simplifying Fractions
		Equivalent Fractions Example	Comparing Fractions 1
		Comparing Fractions	Equivalent Fractions
		Fractions in Lowest Terms	Equivalent Fractions 2
		Finding Common Denominators	Comparing Fractions 2
		Ordering Fractions	
		Comparing Fractions 2	
Add, Subtract Fractions	www.khanacademy.org	Adding Fractions w/ Like Denominators	Adding Frac. w/ Common Denom
		Subtracting Fractions	Subtract Frac. w/Common Denom
		Adding and Subtracting Fractions	Adding Fractions
		Adding Fractions w/ unlike denom	Subtracting Fractions
		Adding Fractions Ex. 1	Adding and Subtracting Fractions
Multiplying Fractions	www.khanacademy.org	Multiplying Fractions	Multiplying Fractions 0.5
		Multiplying Fractions Word Problem	Multip. Fractions Word Problems
Dividing Fractions	www.khanacademy.org	Dividing Fractions	Dividing Fractions 0.5
		Dividing Fractions Example	Dividing Fractions Word Problems
		Dividing Fractions Word Problems	
Mixed Numbers and	www.khanacademy.org	Proper and Improper Fractions	Fractions on the Number Line 2
Improper Fractions		Comparing Imp Frac & Mixed Numbers	Comparing Imp Frac & Mixed No.
		Mixed Numbers and Improper Frac.	Converting Mixed Numbers & I.F.
		Changing a Mixed Number to Imp Frac	

		Changing an Imp Fract to a Mixed No.	
		Ordering Imp. Fractions & Mixed No.	
Topic	**Website**	**Videos**	**Exercises**
Mixed Number Add & Sub	www.khanacademy.org	Adding Mixed Numbers	Add/Subt Mixed Numbers 0.5
		Adding Mixed Nos. w/ Unlike Denom	Add/Subt Mixed Numbers 1
		Adding Mixed Nos. Word Problem	
		Subtracting Mixed Numbers	
		Subtracting Mixed Numbers 2	
		Subtracting Mixed Numbers Word Prob	
Mixed Number Mult & Div		Multiplying Fractions and Mixed Nos.	Multiplying Mixed Numbers 1
		Multiplying Mixed Numbers	
		Dividing Mixed Numbers	
		Dividing Mixed Numbers and Fractions	
Review of Unit 2	www.stlcc.edu	Blackboard PowerPoint	"Unit 2 Review Flashcards"
Compass Practice	http://www.hostos.cuny.edu/oaa/compass/pre-alg_prac2.htm		Fractions

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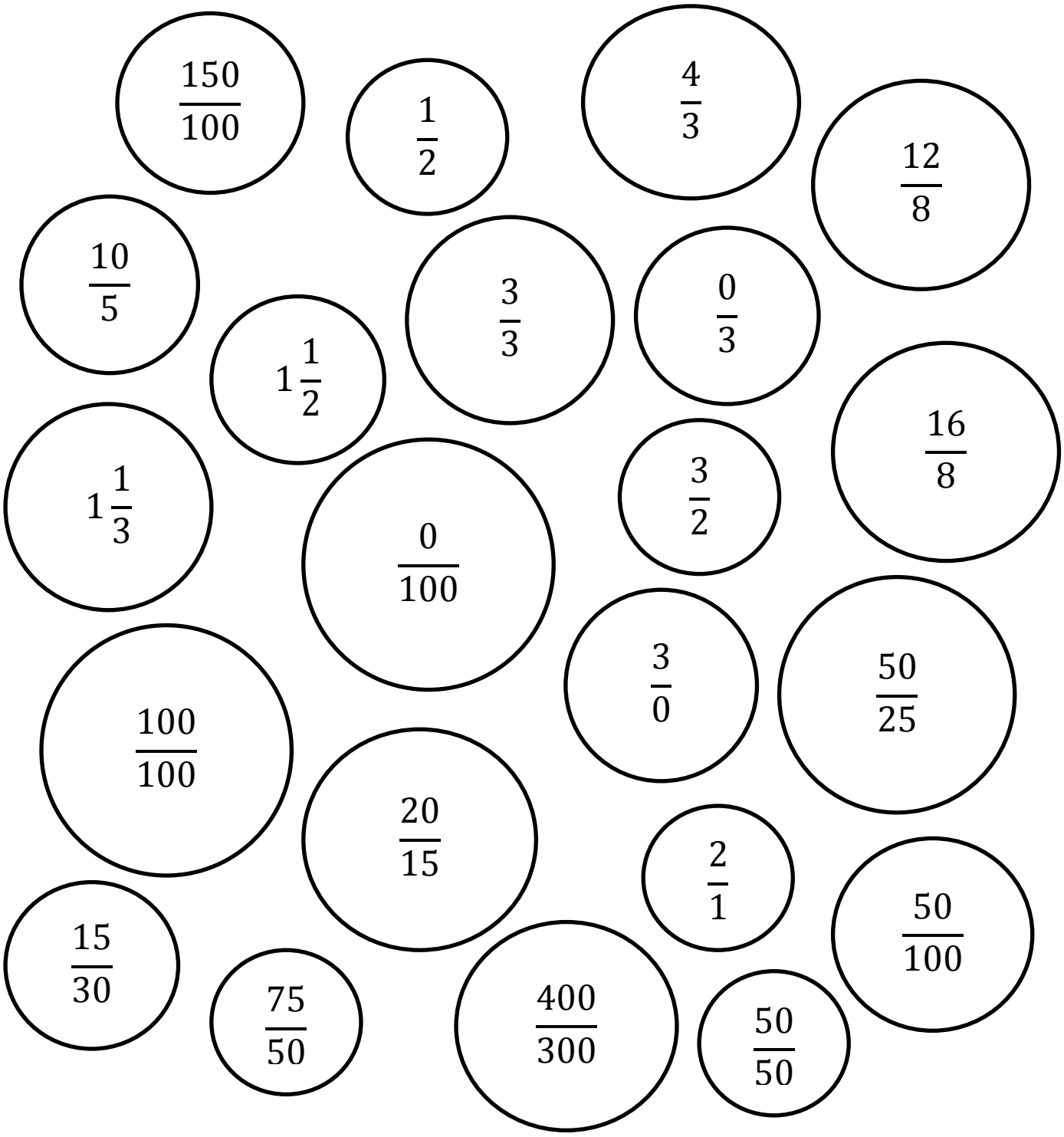
Write five fractions that are equivalent to each number:

$\frac{1}{2}$	$\frac{1}{4}$
$\frac{3}{4}$	0
1	2

To create equivalent fractions, M_____ the N_____ and the D_____ by the S_____ number. This is the same as multiplying the fraction by _____, which does not change its value.

Color all equivalent fractions the same color.



FRACTION RAP

When you're adding up or taking away fractions, don't be a hater!
Bottom number's got to be the same—COMMON DENOMINATOR!

Multiply fractions, no big problem
Top times top and bottom times bottom

Dividing fractions, easy as pie
Flip the second and multiply!

THE BIRTHDAY SONG:

You must have common denominators
You must have common denominators
To ADD or SUBTRACT,
You must have common denominators!

KFC

To Divide Fractions, remember... KFC!!

Keep the first fraction the same.

Flip the second fraction.

Change the division to multiplication.

1. Circle the GREATER number from each pair:

a) $\frac{1}{3}$ $\frac{1}{4}$

b) $\frac{3}{4}$ $\frac{4}{3}$

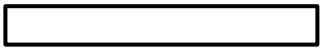
c) $\frac{7}{8}$ $\frac{6}{8}$

d) $\frac{11}{10}$ 1

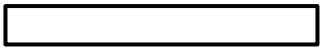
e) $\frac{1}{2}$ $\frac{3}{8}$

f) $\frac{5}{5}$ $\frac{5}{1}$

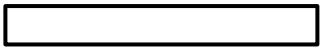
2. Color $\frac{1}{3}$ of the candy bar:



3. Color $\frac{2}{6}$ of the candy bar:



4. Color $\frac{1}{2}$ of the candy bar:



5. Cross out the fraction that is UNDEFINED:

$\frac{5}{0}$ $\frac{0}{5}$

6. What is half of $\frac{2}{3}$?

7. Circle ALL the fractions that equal one half:

$\frac{2}{1}$ $\frac{1}{2}$ $\frac{8}{16}$ $\frac{10}{20}$

8. Simplify. Write your answer in simplest form:

a) $\frac{1}{4} + \frac{3}{4}$

b) $\frac{2}{3} - \frac{1}{4}$

c) $\frac{2}{3} \cdot \frac{3}{4}$

d) $\frac{2}{3} \div \frac{3}{4}$

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

f) $1\frac{3}{4} \times 2\frac{1}{3}$

g) $1\frac{3}{4} \div 2\frac{1}{3}$

Grew or shrunk?	Grew or shrunk?
$20 \times \frac{1}{10} =$ _____	$20 \div \frac{1}{10} =$ _____
$20 \times \frac{1}{2} =$ _____	$20 \div \frac{1}{2} =$ _____
$20 \times \frac{3}{4} =$ _____	$20 \div \frac{3}{4} =$ _____
$20 \times \frac{5}{5} =$ _____	$20 \div \frac{5}{5} =$ _____
$20 \times \frac{5}{4} =$ _____	$20 \div \frac{5}{4} =$ _____

OBSERVATIONS:

When you multiply a number by a fraction < 1, it _____

When you divide a number by a fraction < 1, it _____

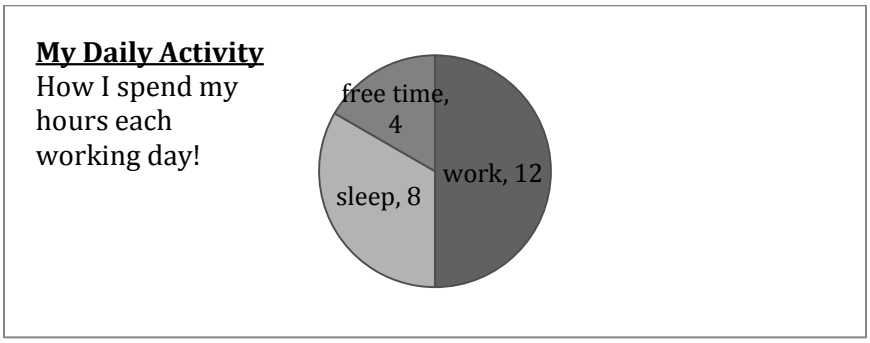
When you multiply a number by 1, it _____

When you divide a number by 1, it _____

When you multiply a number by a fraction > 1, it _____

When you divide a number by a fraction > 1, it _____

Scenario I: On the days when you are working as a CNA, this graph shows how your time breaks down for a 24-hour day:



a) Write each fraction and simplify:

What fraction of your time do you spend working?

What fraction of your time do you spend sleeping?

What fraction of your time do you have free?

Add the three fractions above. What is the total? Why does this total make sense?

****

b) According to the graph, what fraction of the day are you AWAKE?

****

c) What fraction of your DAY OFF do you spend working?

****

d) Your friend spends $\frac{1}{6}$ of her day at work. How long is her shift?

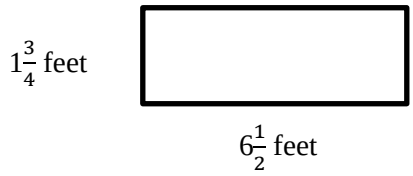
****

e) Your friend has $\frac{1}{5}$ of her day for free time. Who has more free time—you or her?

****

f) You spend $\frac{2}{3}$ of your work time doing direct patient care. How many hours is this?

Scenario II: The storage shelf at work measures $6\frac{1}{2}$ feet by $1\frac{3}{4}$ feet.



a) You decide to attach a rim to go around the edge of the shelf to keep items from falling off. How many feet of rim should you order?

(*Note: You are finding the PERIMETER of the rectangle. You can find it by adding up the lengths of ALL four of the sides*.)

b) Rim material costs $4 per foot. How much will your rim cost?

c) You also choose to buy water-resistant shelf paper to protect the surface of the shelf. A roll of shelf paper covers 5 square feet. How many of rolls will you need?

(*Note: You are finding the AREA of a rectangle. You can find it by multiplying the length of the rectangle by its width. Area is always measured in square units.)*

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III. FACT: Cigarette smoke contains 4,800 chemicals, 69 of which cause cancer.

a) What fraction of the chemicals in cigarette smoke are carcinogenic?

b) What fraction of the chemicals in cigarette smoke are non-carcinogenic?

Scenario IV: As a therapist's assistant, you need to make sure that patients get the exercise ordered by the therapist.

Your patient Fiona is supposed to get ¾ of an hour of exercise, 5 days per week. How much time should she spend exercising in a week?

This week, Fiona kept track of her hours of exercise in this table:

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
$\frac{3}{4}$	$\frac{1}{2}$	$\frac{2}{3}$	$\frac{1}{4}$	$1\frac{1}{2}$	0	0

How many hours did Fiona exercise this week?

How many *minutes* of exercise did Fiona get this week?

What fraction of Fiona's total exercise was done over the weekend?

Did Fiona get enough exercise this week? If not, how much more would she have needed to meet the therapist's recommendation?

What is the MEAN amount of time Fiona exercised each of the five weekdays? (Don't count the weekend!)

Fiona's best friend Sharona got half as much exercise as Fiona did this week. How many hours did Sharona exercise?

Scenario V: You are in charge of medication. Fill in the following table:

Patient Name	Number of Doses Per day	Number of Pills per dose	Total number of pills Per day
Foster	3	1 ½ tablets	
Grimes	7	¾ tablet	
Haike		1 ½ tablets	9 tablets
Iona		¾ tablet	6 ¾ tablets
Jones	5		17 ½ tablets
Koric	4		3 tablets

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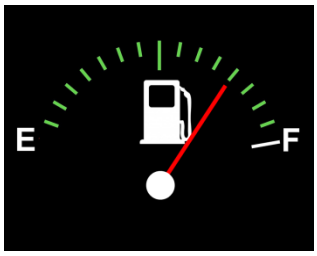
VI. Graphic Practice:

a) How much does the item weigh?

b) How full is the gas tank?



c) How long is the line segment?

Resources

Works used in VI. Graphic Practice

a) Fraction Scale by OER_Training is licensed under CC BY 4.0

b) Gas Gauge is a derivative of Fuel Gauge, which is available in the public domain under CC0 Public Domain

c) Line Segment is a derivative of 10cm ruler, which is available in the public domain