

## 4-1 Number Theory and Fractions

### Challenge: Prime Shades

For each given number, shade one box in each row of the table to show a prime factor. Then use your shaded boxes to write each number's prime factorization.

1. 12

7	2
3	5
2	11

**Prime factorization:**

\_\_\_\_\_

2. 70

5	3
2	11
3	7

**Prime factorization:**

\_\_\_\_\_

3. 63

3	5
2	3
11	7

**Prime factorization:**

\_\_\_\_\_

4. 150

13	5
3	7
2	11
17	5

**Prime factorization:**

\_\_\_\_\_

5. 84

11	7
5	2
13	2
3	17

**Prime factorization:**

\_\_\_\_\_

6. 260

5	11
3	2
17	13
2	7

**Prime factorization:**

\_\_\_\_\_

7. 80

5	7
17	2
2	13
11	2
2	3

**Prime factorization:**

\_\_\_\_\_

8. 1,750

17	5
13	7
31	5
5	3
2	11

**Prime factorization:**

\_\_\_\_\_

9. 3,234

5	3
17	7
31	11
2	13
7	23

**Prime factorization:**

\_\_\_\_\_

## 4-2 Number Theory and Fractions

### Challenge: The Greatest Common Flower

A florist made these flower arrangements for a wedding. He used every flower in each crate he had to create the greatest number of arrangements possible. Study the flowers the florist had in each crate on the left. Below each, write the number of arrangements the florist made with those flowers. Then draw a line to the correct arrangement on the right that the florist created with those flowers.



6      18      24

Number of arrangements: \_\_\_\_\_

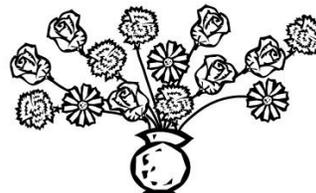
A.



12      16      20

Number of arrangements: \_\_\_\_\_

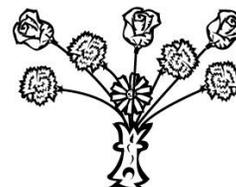
B.



15      30      35

Number of arrangements: \_\_\_\_\_

C.



21      42      56

Number of arrangements: \_\_\_\_\_

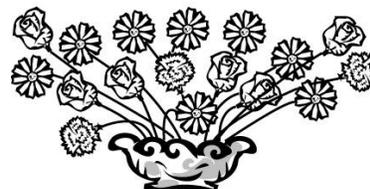
D.



9      15      18

Number of arrangements: \_\_\_\_\_

E.



## 4-3 Number Theory and Fractions

### Challenge: A Very Thirsty Animal

An algebraic expression may contain more than one variable. For example, the expression  $12x + 14y$  contains the variables  $x$  and  $y$ . Writing this expression as a product of the GCF and a sum is similar to the process for expressions that have one variable.

$$\begin{aligned}
 &12x + 14y \\
 &= 2 \cdot 2 \cdot 3 \cdot x + 2 \cdot 7 \cdot y \\
 &= 2 \cdot 6x + 2 \cdot 7y \\
 &= 2(6x + 7y)
 \end{aligned}$$

The terms are  $12x$  and  $14y$ .  
 The GCF of the terms is 2.  
 Rewrite each term as a product with the GCF.  
 Apply the Distributive Property.

In each column, circle the expression that is equivalent to the expression at the top of the column. Then arrange the corresponding letters to answer the question below.

$15c + 25d$	$18m + 9n$	$42x + 12y$	$24e + 36g$	$20w + 28x$
S	C	O	G	F
$5(3c + 25d)$	$9(2m + n)$	$7(6x + 5y)$	$12(2e + 36g)$	$5(4w + 10x)$
R	J	L	E	H
$15(c + 3d)$	$18(m + 2n)$	$6(7x + 2y)$	$12(2e + 3g)$	$2(10w + 28x)$
A	B	P	U	T
$5(3c + 5d)$	$9(2m + 1)$	$2(21x + 12y)$	$4(6e + 32g)$	$10(2w + 2x)$
T	N	S	D	M
$15(c + d)$	$18(m + n)$	$42(x + 12y)$	$4(24e + 9g)$	$4(5w + 7x)$

**What animal can survive for a week or more without water and can live several months without food?**

\_\_\_\_\_

## 4-4 Number Theory and Fractions

### Challenge: Fractions of Pizza

Write the fractions as decimals. Then slice and shade pieces of each pizza to represent each fraction. Finally, compare the pizzas in each row by writing  $<$ ,  $>$ , or  $=$ .

1.  $\frac{3}{4}$  \_\_\_\_\_



$\frac{4}{5}$  \_\_\_\_\_



2.  $\frac{3}{6}$  \_\_\_\_\_



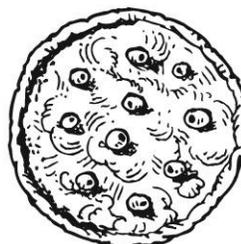
$\frac{1}{2}$  \_\_\_\_\_



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



$\frac{3}{5}$  \_\_\_\_\_



4.  $\frac{1}{5}$  \_\_\_\_\_



$\frac{1}{3}$  \_\_\_\_\_

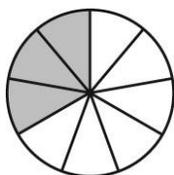


## 4-5 Number Theory and Fractions

### Challenge: Match That Fraction!

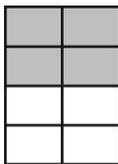
Write the fraction that the shaded part of each figure represents. Then match equivalent fractions by drawing lines between numbered and lettered figures.

1.



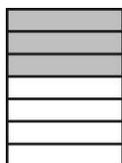
Fraction: \_\_\_\_\_

A.



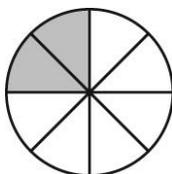
Fraction: \_\_\_\_\_

2.



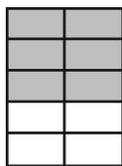
Fraction: \_\_\_\_\_

B.



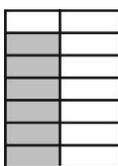
Fraction: \_\_\_\_\_

3.



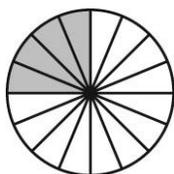
Fraction: \_\_\_\_\_

C.



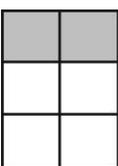
Fraction: \_\_\_\_\_

4.



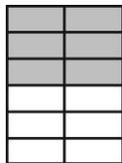
Fraction: \_\_\_\_\_

D.



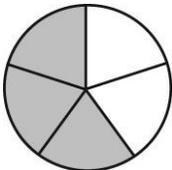
Fraction: \_\_\_\_\_

5.



Fraction: \_\_\_\_\_

E.

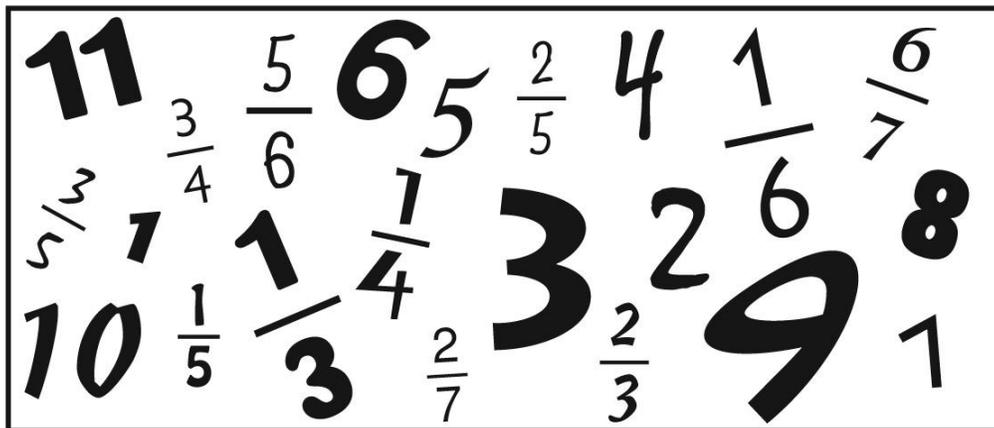


Fraction: \_\_\_\_\_

## 4-6 Number Theory and Fractions

### Challenge: Mixed Up Mixed Numbers

Find the whole number and fraction in the box to make a mixed number to match each improper fraction listed below. Cross out each whole number and fraction as you use it. When you have finished, the unused items in the box will form the mixed number that answers the question at the bottom of the page.



1.  $\frac{7}{3} =$  \_\_\_\_\_

2.  $\frac{20}{3} =$  \_\_\_\_\_

3.  $\frac{21}{4} =$  \_\_\_\_\_

4.  $\frac{31}{4} =$  \_\_\_\_\_

5.  $\frac{41}{5} =$  \_\_\_\_\_

6.  $\frac{57}{5} =$  \_\_\_\_\_

7.  $\frac{59}{6} =$  \_\_\_\_\_

8.  $\frac{19}{6} =$  \_\_\_\_\_

9.  $\frac{13}{7} =$  \_\_\_\_\_

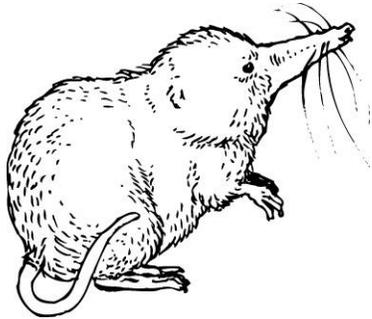
10.  $\frac{72}{7} =$  \_\_\_\_\_

How old is the moon? \_\_\_\_\_ billion years old!

## 4-7 Number Theory and Fractions

### Challenge: Light as a Feather

The pygmy shrew is the lightest mammal on Earth. It weighs only 0.05 ounces. That's lighter than most feathers! Use the clues below to complete the table with each tiny animal's weight.

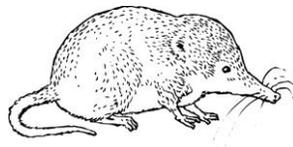


**Lightest Mammals**

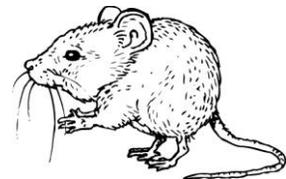
Mammal	Weight (oz)
	$\frac{1}{20}$
	$\frac{11}{100}$
	$\frac{7}{100}$
	$\frac{9}{50}$
	$\frac{2}{25}$

The smallest pygmy shrews are only  $1\frac{1}{2}$  inches long!

1. Thousands of masked shrews live all over North America, but they are rarely seen. Although tiny, they have enormous appetites—often eating more than their body weight each day in bugs, slugs, and other crawly things. A masked shrew weighs more than a kitti's hog-nosed bat, but less than a pipistrelle bat.



2. Several different speices of harvest mice live in the United States. They are excellent climbers and spend much of the night scampering around in search of seeds and bugs to eat. During the day, they stay at home to avoid their worst enemies: hawks, owls, and snakes. A harvest mouse weighs more than any other animal listed in the table.



3. Kitti's hog-nosed bats live only in Asia. They spend most of the day hanging in deep, dark caves. At night, they leave the cave and fly around catching bugs to eat. About the size of a bumblebee, a kitti's hog-nosed bat weighs more than a pygmy shrew, but less than a masked shrew.



4. Pipistrelle bats are the smallest bats in the United States. They are unusual for bats, because they often fly in daylight to catch beetles and other bugs to eat. In winter, they hibernate in caves or other dark places. During that time, the bats are often covered with droplets of water, which sparkle and give them a pearly glow. A pipistrelle bat weighs less than a harvest mouse, but more than a masked shrew.



Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_