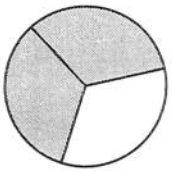
Name _____

Parts of a Region

R 9-1

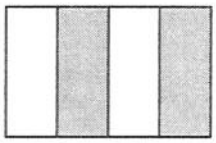
The top number, the numerator, tells the number of equal parts described. The bottom number, the denominator, tells how many equal parts there are in all.

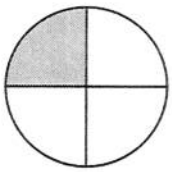


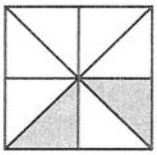
$\frac{2}{3}$ ← Numerator. 2 parts are shaded.
$\frac{2}{3}$ ← Denominator. There are 3 parts total.

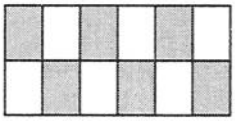
$\frac{2}{3}$ of the circle is shaded.

Write a fraction for the part of the region that is shaded.

1.  _____

2.  _____

3.  _____

4.  _____

Draw a model to show each fraction.

5. $\frac{5}{15}$

6. $\frac{7}{9}$

7. Reasoning Tara says that $\frac{1}{2}$ of a salad is always the same amount. Lynn says that it could be different amounts, depending on how large the salad is. Who is correct? Why?

_____

_____

_____

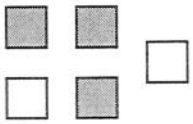
Name _____

Parts of a Set

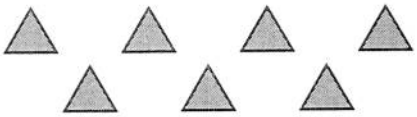
R 9-2

A fraction can describe a part of a set.

What fraction of each set is shaded?



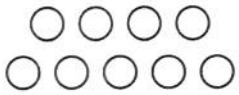
There is a total of 5 squares. 3 of them are shaded. So, $\frac{3}{5}$ of the squares are shaded.



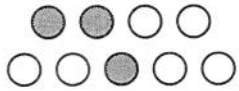
There is a total of 7 triangles. All 7 of them are shaded. So, $\frac{7}{7}$ of the triangles are shaded.

Draw a set with $\frac{3}{9}$ circles shaded.

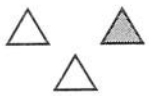
The denominator tells how many circles are in the set, 9. So, draw 9 circles.



The numerator tells how many circles should be shaded, 3. So, shade in 3 circles.



What fraction of each set is shaded?

1. 

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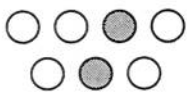
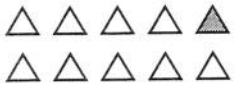
2. 

_____

3. 

_____

4. 

_____

Draw a picture to show each fraction as a part of a set.

5. $\frac{2}{9}$

6. $\frac{4}{6}$

7. Reasoning Holly has a collection of 12 CDs. Of the 12 CDs, 7 of them are classical music. Write a fraction to show how many of the CDs are classical music.

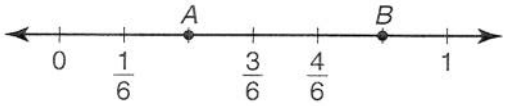
_____

Name _____

Fractions, Length, and the Number Line

R 9-3

How to show fractions on a number line:



The number line is divided into 6 equal lengths because the denominator is 6. The numerators go in order from 1 to 6. $\frac{2}{6}$ should be written at point *A*. $\frac{5}{6}$ should be written at point *B*.

How to write a fraction for the part of the length that is shaded:

The length has been divided into 9 equal parts. 9 is the denominator of the fraction. Because 5 of the lengths are shaded, 5 is the numerator of the fraction. So, $\frac{5}{9}$ is shaded.

Write a fraction for the part of each length that is shaded.

1.

_____

2.

_____

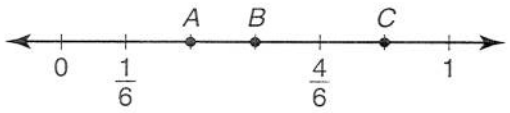
3.

_____

4. 

_____

What fraction should be written at each point?



5. *A* _____ **6.** *B* _____ **7.** *C* _____

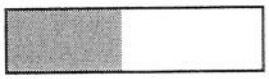
8. Number Sense To show $\frac{4}{5}$ on a number line, how many equal parts should be between 0 and 1? _____

Name _____

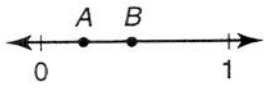
Estimating Fractional Parts

R 9-4

Benchmark fractions are fractions that are commonly used, such as $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{3}$, and $\frac{3}{4}$. They are useful when you estimate fractional parts. For example:



About $\frac{1}{2}$ of the rectangle is shaded.



Point *A* is at about $\frac{1}{4}$.

Point *B* is at about $\frac{1}{2}$.

About $\frac{1}{3}$ of the length is shaded.

Estimate the fractional part of each that is shaded.

1. 

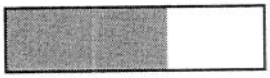
_____

2. 

_____

3. 

_____

4. 

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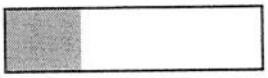
5. 

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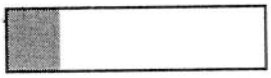
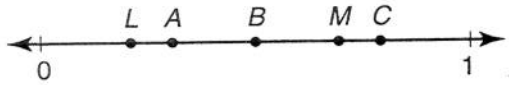
6. 

_____

Estimate the fraction that should be written at each point.



7. *L* _____

8. *A* _____

9. *B* _____

10. *M* _____

11. *C* _____

12. Number Sense There is a pan of food. About $\frac{1}{4}$ of the food has been eaten. About how much food is left? _____

Name _____

PROBLEM-SOLVING STRATEGY **R 9-5**

Draw a Picture

The Fence A fence is 20 ft long. It has posts at each end and at every 4 ft along its length. How many fence posts are there?

Read and Understand

Step 1: What do you know?

The fence is 20 ft long.

There are fence posts at each end.

There are fence posts every 4 ft along the length of the fence.

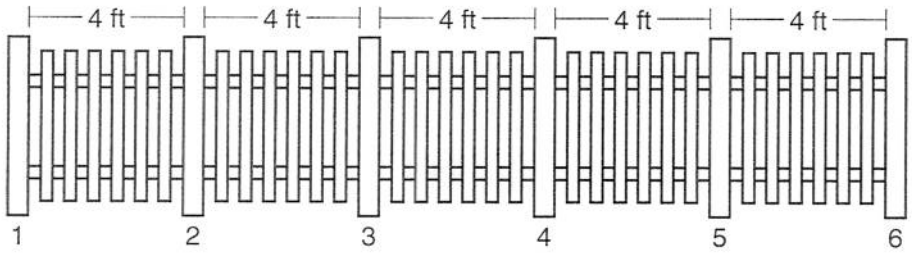
Step 2: What are you trying to find?

How many posts the fence has

Plan and Solve

Step 3: What strategy will you use?

Strategy: Draw a picture



There are 6 fence posts altogether.

Look Back and Check

Step 4: Is your work correct?

Yes, the picture shows that there is a total of 6 fence posts.

Solve the problem. Write the answer in a complete sentence.

1. Tim, Kara, and Ann are working together to write a 4-page report. Each student is going to do an equal amount of writing. What fraction of the entire report does each student need to write?

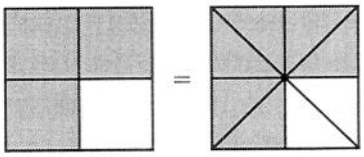
_____

Name _____

Equivalent Fractions

R 9-6

The fractions $\frac{3}{4}$ and $\frac{6}{8}$ both tell how much of the square is shaded. The fractions are equivalent.



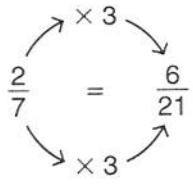
$\frac{3}{4} = \frac{6}{8}$

You can find equivalent fractions using multiplication or division.

Using multiplication:

Write a fraction equivalent to $\frac{2}{7}$.

Multiply the numerator and denominator by the same number, but do not use zero.

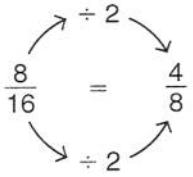


So, $\frac{2}{7} = \frac{6}{21}$.

Using division:

Write a fraction equivalent to $\frac{8}{16}$.

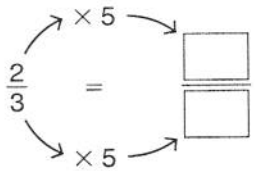
Divide the numerator and denominator by the same number.



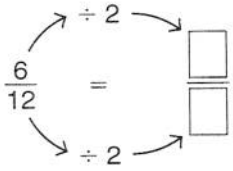
So, $\frac{8}{16} = \frac{4}{8}$.

Multiply or divide to find equivalent fractions.

1.



2.



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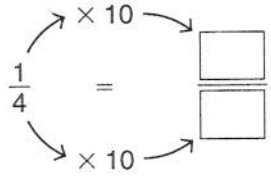
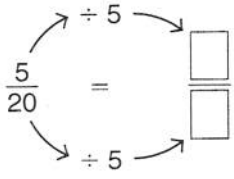


4.



5. $\frac{4}{5}$ _____

6. $\frac{8}{10}$ _____

7. $\frac{7}{9}$ _____

8. $\frac{12}{16}$ _____

Name _____

Fractions in Simplest Form

R 9-7

A fraction is in simplest form if the only common factor of the numerator and denominator is 1. $\frac{5}{20}$ in simplest form is $\frac{1}{4}$ because the numerator and denominator have no common factors other than 1.

Write $\frac{20}{30}$ in simplest form.

Step 1: Divide the numerator and denominator of the fraction by one of their common factors.

A common factor of 20 and 30 is 2.

$20 \div 2 = 10$

$30 \div 2 = 15$

Step 2: Check to see if $\frac{10}{15}$ is in simplest form.

No, 10 and 15 have a common factor of 5.

Repeat division.

Step 3: Divide the numerator and denominator by the common factor.

$10 \div 5 = 2$

$15 \div 5 = 3$

Step 4: Check to see if $\frac{2}{3}$ is in simplest form.

Yes, the only common factor of 2 and 3 is 1.

So, $\frac{20}{30}$ in simplest form is $\frac{2}{3}$.

Write each fraction in simplest form. If it is in simplest form, write *simplest form*.

1. $\frac{6}{8}$ _____
2. $\frac{9}{10}$ _____
3. $\frac{10}{12}$ _____
4. $\frac{7}{8}$ _____
5. $\frac{25}{50}$ _____
6. $\frac{3}{15}$ _____
7. $\frac{15}{22}$ _____
8. $\frac{16}{20}$ _____

9. **Writing in Math** Kevin said that $\frac{300}{500}$ is in simplest form because 3 and 5 have only 1 as a common factor. Is he correct? Explain why or why not.

_____

_____

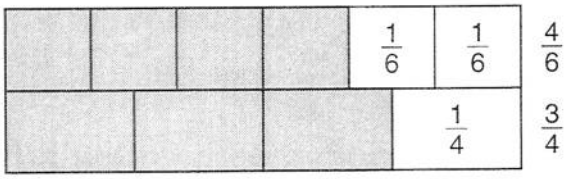
_____

Name _____

Using Number Sense to Compare Fractions

R 9-8

Leanne wanted to compare $\frac{4}{6}$ and $\frac{3}{4}$. She used fraction strips to help.



She compared the amounts that were shaded in each picture. Because the amount shaded in $\frac{3}{4}$ is more than the amount shaded in $\frac{4}{6}$, she knew that $\frac{3}{4}$ is greater than $\frac{4}{6}$.

So, $\frac{3}{4} > \frac{4}{6}$.

Write > or < for each ◯. You may use fraction strips to help.

1. $\frac{5}{6}$ ◯ $\frac{2}{3}$ **2.** $\frac{1}{5}$ ◯ $\frac{2}{8}$ **3.** $\frac{9}{10}$ ◯ $\frac{6}{8}$ **4.** $\frac{3}{4}$ ◯ $\frac{1}{4}$

5. $\frac{8}{9}$ ◯ $\frac{5}{10}$ **6.** $\frac{2}{5}$ ◯ $\frac{2}{6}$ **7.** $\frac{6}{9}$ ◯ $\frac{7}{9}$ **8.** $\frac{2}{10}$ ◯ $\frac{3}{5}$

The same number of students attended school all week.

Day	Fraction of Students Buying Lunch
Monday	$\frac{1}{2}$
Tuesday	$\frac{2}{5}$
Wednesday	$\frac{3}{4}$
Thursday	$\frac{5}{8}$
Friday	$\frac{4}{6}$

9. Did more students buy lunch on Tuesday or on Wednesday? _____

10. Did more students buy lunch on Thursday or on Friday? _____

Name _____

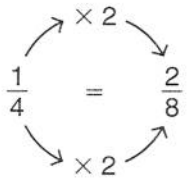
Comparing and Ordering Fractions

R 9-9

Comparing fractions:

Compare $\frac{1}{4}$ and $\frac{3}{8}$.

Multiply or divide to make the denominators the same. Then compare the numerators.

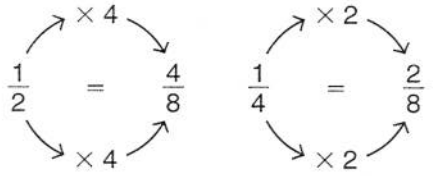


$\frac{2}{8} < \frac{3}{8}$

So, $\frac{1}{4} < \frac{3}{8}$.

Ordering fractions: Order $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{3}{8}$ from least to greatest.

Use equivalent fractions.



Compare the numerators. $\frac{2}{8} < \frac{3}{8}$ and $\frac{3}{8} < \frac{4}{8}$

The fractions in order are: $\frac{1}{4}$, $\frac{3}{8}$, $\frac{1}{2}$

Compare. Write >, <, or =.

1. $\frac{1}{6} \bigcirc \frac{2}{8}$ **2.** $\frac{3}{5} \bigcirc \frac{3}{10}$ **3.** $\frac{5}{7} \bigcirc \frac{6}{9}$ **4.** $\frac{1}{2} \bigcirc \frac{4}{6}$

Order the numbers from least to greatest.

5. $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$ _____ **6.** $\frac{2}{3}$, $\frac{3}{4}$, $\frac{2}{5}$ _____

7. $\frac{2}{9}$, $\frac{4}{5}$, $\frac{2}{8}$ _____ **8.** $\frac{1}{4}$, $\frac{7}{8}$, $\frac{5}{6}$ _____

9. Writing in Math Orlando wrote that $\frac{4}{5}$ is less than $\frac{4}{6}$. Is he correct? If not, explain how to find the correct answer.

_____

_____

_____

_____

Name _____

Mixed Numbers and Improper Fractions

R 9-10

How to write mixed numbers as improper fractions:

Write $3\frac{1}{5}$ as an improper fraction.

First multiply the denominator by the whole number.

$3\frac{1}{5}$ $\quad 5 \times 3 = 15$

Add the numerator to this sum. $\quad 15 + 1 = 16$

Write the sum as the numerator. → $\frac{16}{}$

Use the denominator from the fraction. → $\frac{16}{5}$

So, $3\frac{1}{5} = \frac{16}{5}$.

How to write improper fractions as mixed numbers:

Write $\frac{7}{4}$ as a mixed number.

First divide the numerator by the denominator.

$$4\overline{)7}\quad 1$$
$$-\,4$$
$$3$$

The quotient is the whole number. → $1\frac{}{}$

The remainder is the new numerator. → $1\frac{3}{}$

The denominator stays the same. → $1\frac{3}{4}$

So, $\frac{7}{4} = 1\frac{3}{4}$.

Write each mixed number as an improper fraction.

1. $2\frac{1}{3}$ _____ **2.** $4\frac{1}{5}$ _____ **3.** $2\frac{3}{4}$ _____ **4.** $5\frac{2}{6}$ _____

Write each improper fraction as a mixed number or a whole number.

5. $\frac{13}{12}$ _____ **6.** $\frac{50}{10}$ _____ **7.** $\frac{23}{10}$ _____ **8.** $\frac{17}{15}$ _____

9. Writing in Math Is $\frac{45}{5}$ equal to a whole number or a mixed number? Explain how you know.

_____

_____

_____

_____

Name _____

Comparing Mixed Numbers

R 9-11

Here are some ways to compare mixed numbers.

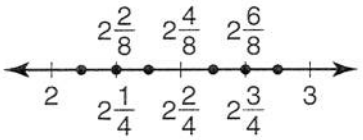
Compare $1\frac{4}{8}$ and $3\frac{1}{5}$.

You can look at the whole numbers to decide which mixed number is larger.

$3 > 1$, so $3\frac{1}{5} > 1\frac{4}{8}$.

Compare $2\frac{1}{4}$ and $2\frac{6}{8}$.

Use a number line.

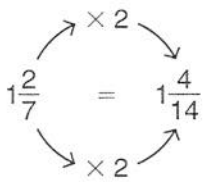


Because $2\frac{6}{8}$ is to the right of $2\frac{1}{4}$, it is greater.

So, $2\frac{6}{8} > 2\frac{1}{4}$.

Compare $1\frac{2}{7}$ and $1\frac{9}{14}$.

Find fractions with the same denominators.



$1\frac{9}{14} > 1\frac{4}{14}$

So, $1\frac{9}{14} > 1\frac{2}{7}$.

Compare. Write <, >, or = for each ◯.

1. $3\frac{3}{4}$ ◯ $3\frac{5}{6}$

2. $1\frac{7}{8}$ ◯ $2\frac{7}{8}$

3. $2\frac{1}{2}$ ◯ $2\frac{2}{5}$

4. $5\frac{1}{5}$ ◯ $5\frac{2}{8}$

5. $5\frac{5}{25}$ ◯ $5\frac{4}{20}$

6. $6\frac{9}{10}$ ◯ $5\frac{8}{50}$

A large snowstorm hit northern New York in November, 2000. The table shows the number of feet of recorded snowfall in some areas during the storm.

Location	Feet of Snow
Central Buffalo	$1\frac{5}{6}$
Jamestown	$1\frac{1}{2}$
Buffalo	$2\frac{1}{12}$
West Monroe	$2\frac{1}{6}$

7. Which town got more snow, Jamestown or Central Buffalo?

_____

8. Which town got more snow, Buffalo or West Monroe?

_____

Name _____

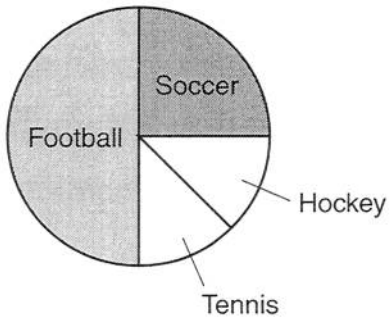
Circle Graphs

R 9-12

This circle graph shows what sport fourth-grade students liked best. $\frac{1}{2}$ of the students liked football the best. You know this because $\frac{1}{2}$ of the circle is shaded for football.

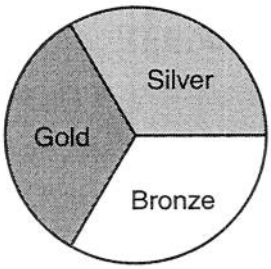
Because $\frac{1}{4}$ of the students liked soccer the best, $\frac{1}{4}$ of the circle is shaded for soccer. $\frac{1}{8}$ of the students liked hockey the best, and $\frac{1}{8}$ liked tennis the best.

Favorite Sports of Fourth Graders

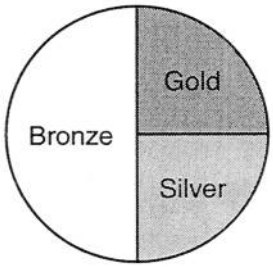


For 1–5, use the circle graphs below.

2002 Winter Olympics Medals, Italy



2002 Winter Olympics Medals, China



1. What fraction of the medals won by Italy was gold? _____

2. What fraction of the medals won by China was silver? _____

3. What fraction describes the number of silver medals won by Italy? _____

4. What fraction describes the number of bronze medals won by China? _____

5. **Number Sense** Did China win more gold or bronze medals? _____

Name_____

PROBLEM-SOLVING SKILL **R 9-13**

Writing to Explain

Pasta Gina and her brother Don made homemade pasta with their mother. Gina made $3\frac{1}{4}$ pans of pasta. Don made $3\frac{3}{8}$ pans. Which person made more pasta?

Writing a Good Math Explanation

- Write your explanation in steps to make it clear.
- Tell what the numbers mean in your explanation.
- Tell why you took certain steps.

Example

- First I compared the whole numbers. Because they were the same, I knew I had to compare the fractions.
- Because $\frac{1}{4}$ and $\frac{3}{8}$ have different denominators, I multiplied the numerator and denominator of $\frac{1}{4}$ by 2 to get $\frac{2}{8}$.
- Then I could compare the mixed numbers $3\frac{2}{8}$ and $3\frac{3}{8}$. Because $3\frac{3}{8}$ is greater than $3\frac{2}{8}$, I knew that Don made more pasta.

1. Humans usually have 20 baby teeth, which are replaced by 32 adult teeth. Raul said he has lost $\frac{6}{20}$ of his baby teeth. Write two fractions equivalent to this number. Explain how you came up with the fractions.

Name _____

PROBLEM-SOLVING APPLICATIONS **R 9-14**

The Football Team

In a football game, there are a total of 22 players on the field at a time. One team plays offense and the other plays defense. What fraction of the players is on offense?

Offensive players ⟶ o o o o o o o o o o o

Defensive players ⟶ d d d d d d d d d d d

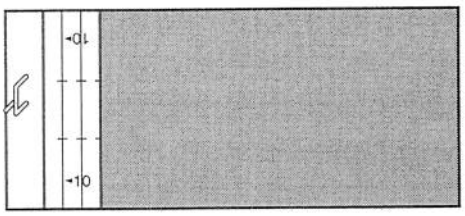
Because there are 22 players total, the denominator is 22. Because 11 of the players are on offense, the numerator is 11. So, $\frac{11}{22}$ players are on offense. In simplest form, $\frac{11}{22} = \frac{1}{2}$. So, $\frac{1}{2}$ of the players are on offense and $\frac{1}{2}$ are on defense.

1. The coaches made the players run sprints down the football field to get in shape. The running backs had to run down the field $6\frac{3}{4}$ times. The linemen had to run down the field $6\frac{5}{8}$ times. Which group ran more? Explain.

_____

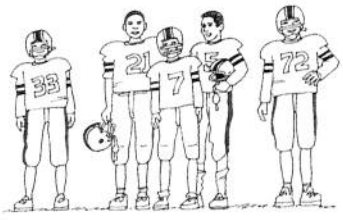
_____

2. Because it was going to rain, the team covered the playing field with a tarp to keep it dry. About how much of the field has been covered with the tarp? _____



3. What fraction of players have their helmets on?

_____



4. The team played 16 games during the season. They won 4 games. So, the fraction that shows the number of games they won is $\frac{4}{16}$. Write this fraction in simplest form.

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