

Objectives

- Recognize that $\frac{3}{3}$, $\frac{4}{4}$, and $\frac{6}{6}$ equal 1 whole
- Develop an understanding of mixed numbers
- Demonstrate an understanding of an improper fraction and its equivalent mixed number
- Compare mixed numbers

Teacher Materials

- Fraction Kit: fraction circles
- Mixed Numbers transparency, page IA25 (CD)
- Division flashcards: 8 as a divisor, and previously reviewed division facts
- 3 paper plates

Student Materials

- Fraction Kit: fraction circles
- Number Cards: 0–9

Practice and Review

Count by 3s to 30 and count by 4s to 40

Follow a procedure similar to the counting by 2s and 5s in Lesson 30.

Division facts: 8 as a divisor

Introduce the Lesson

Sharks are one of the dangers to people diving for treasure. These sea animals have 4 or more rows of teeth. Scientists, using a shark bite meter, have found that a $6\frac{1}{2}$ -foot shark can exert a force of 132 pounds between its jaws.

Since God has placed within animals a natural fear of man, sharks show little interest in attacking people. However, sharks will attack if they feel threatened. When sharks are known to be present, the wisest thing to do is to leave the water. [Bible Promise: I. God as Master]

Teach for Understanding

Recognize that $\frac{3}{3}$, $\frac{4}{4}$, and $\frac{6}{6}$ equal 1

1. Distribute the Fraction Kit circles and direct the students to place a whole circle on their desks. Trace your circle for display. Demonstrate each step.

2. Direct the students to place thirds on the circle to make 1 whole circle.

Count the thirds together: $\frac{1}{3}$, $\frac{2}{3}$, $\frac{3}{3}$.

► **How many thirds are in 1 whole?** 3

► **What fraction can you write to show that there are 3 thirds in 1 whole?** $\frac{3}{3}$

Write $\frac{3}{3}$ for display. Read the fraction together: *three-thirds*.

► **What do you notice about a fraction that is written to represent 1 whole?** *The numerator and the denominator are the same number.*

► **What is $\frac{3}{3}$ equal to?** 1 or 1 whole

3. Write $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \underline{\quad}$ for display.

► **What is the sum of this equation?** $\frac{3}{3}$ or 1 whole

Complete the equation: $\frac{3}{3} = 1$.

4. Repeat the procedure for fourths and sixths.

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

$$\frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{6}{6} = 1$$

Develop an understanding of mixed numbers

1. Display 2 paper plates.

► **How many whole paper plates are there?** 2

► **How could you use 1 of the paper plates to show thirds?**

Elicit by drawing lines, coloring, or cutting to divide the plate into 3 equal parts.

2. Cut 1 of the paper plates in thirds. Display one third to the right of the whole paper plate.

► **How many paper plates are there now?** *Elicit $1\frac{1}{3}$.*

3. Write $1\frac{1}{3}$ for display and write *mixed number* above $1\frac{1}{3}$.

Explain that a number written as a whole number and a fraction is called a *mixed number*; you read the whole number first, say the word *and*, and then read the fraction. Lead in reading the mixed number: *1 and $\frac{1}{3}$.*

4. Place another third of the paper plate with the displayed $1\frac{1}{3}$.

► **Now how many paper plates are there?** $1\frac{2}{3}$

Write $1\frac{2}{3}$ and lead in reading the mixed number: *1 and $\frac{2}{3}$.*

5. Repeat the procedure for $2\frac{1}{4}$, $2\frac{2}{4}$, and $2\frac{3}{4}$.

(*Note:* Elicit from the students that $2\frac{2}{4}$ can also be written as $2\frac{1}{2}$.)

Demonstrate an understanding of an improper fraction and its equivalent mixed number

1. Direct each student to place on his desk the fourths from the Fraction Kit circles.

► **Why are these called fourths?** *4 of the equal parts make 1 whole.*

Mrs. Martin made 5 pies for Thanksgiving dinner. She cut each pie in fourths. After dinner, she had 1 fourth of each pie left. How much pie did Mrs. Martin have left?

2. Guide the students in placing 5 of the fourths on one side of their desks to represent the 1 fourth left of each of the 5 pies. Demonstrate each step.

► **How many fourths of pie did Mrs. Martin have left?** 5

Write $\frac{5}{4}$ for display.

► **How does $\frac{5}{4}$ differ from the other fractions you have worked with today?** *Possible answers: The numerator is larger than the denominator; there are 5 fourths which is more than 1 whole; $\frac{5}{4}$ is greater than 1 whole.*

3. Elicit from the students that when the numerator of a fraction is equal to or greater than the denominator, the fraction is called an *improper fraction*—its value is equal to or greater than 1 whole.

Mrs. Martin wants to store the 5 fourths of pie in as few pie plates as possible in the refrigerator. How many pie plates will Mrs. Martin fill?

► **How many fourths are in 1 whole?** 4

4. Direct the students to make as many whole “pies” as possible from their 5 fourths.

► **How many whole “pies” did you make?** 1

► **How many extra fourths do you have?** 1

► **How many pie plates will Mrs. Martin need?** 2

► **How much of the pie plates will Mrs. Martin fill?** $1\frac{1}{4}$

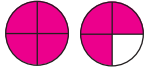
5. Write $1\frac{1}{4}$ beside $\frac{5}{4}$; allow enough space between them to write =. (Do not write = yet.)

Mixed Numbers

Name _____

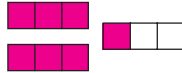
Color to show the **word form**. Write the mixed number.

1. one and three-fourths



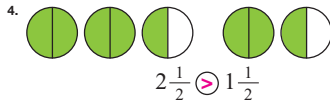
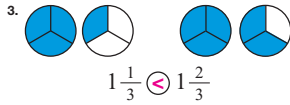
$$1\frac{3}{4}$$

2. two and one-third



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

Write $>$ or $<$ to compare.



5. $1\frac{1}{4} < 1\frac{3}{4}$ 6. $3\frac{1}{3} > 2\frac{2}{3}$ 7. $5\frac{5}{6} > 5\frac{1}{6}$ 8. $2\frac{5}{8} < 3\frac{1}{8}$

Mixed Numbers and Improper Fractions



Count the wholes and parts of a whole.

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

mixed number

or

$$\frac{3}{3} + \frac{3}{3} + \frac{2}{3} = \frac{8}{3}$$

improper fraction

Write two names for the colored part.



mixed number

$$\frac{10}{3}$$

improper fraction

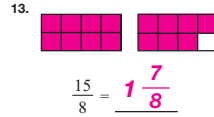
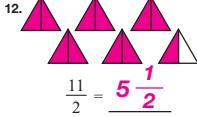
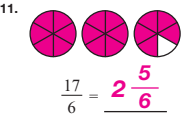


mixed number

$$\frac{11}{6}$$

improper fraction

Color the parts to show the improper fraction. Write the mixed number.



Math 4 Worktext, Chapter 3, Lesson 32

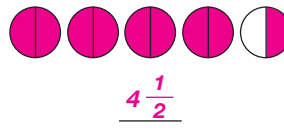
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Color the circle **green** if the number is a mixed number.
Color the circle **red** if the number is an improper fraction.

1. $\frac{11}{5}$ 2. $6\frac{3}{8}$ 3. $\frac{5}{6}$ 4. $\frac{9}{5}$ 5. $\frac{10}{6}$ 6. $4\frac{2}{10}$ 7. $\frac{1}{2}$

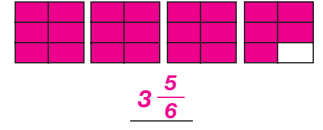
Color to show the **word form**. Write the mixed number.

2. four and one-half



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

3. three and five-sixths

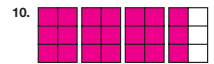
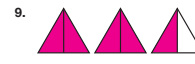
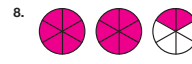


$$3\frac{5}{6}$$

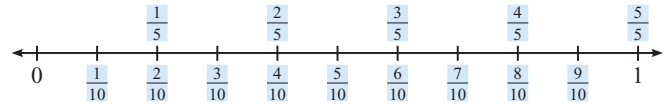
Write $>$ or $<$ to compare.

4. $3\frac{1}{2} < 4\frac{1}{2}$ 5. $7\frac{1}{5} > 2\frac{3}{5}$ 6. $4\frac{7}{8} > 4\frac{1}{8}$ 7. $6\frac{1}{3} < 6\frac{2}{3}$

Color the parts to show the improper fraction. Write the mixed number.



Use the number line to compare the *unlike* fractions. Write $>$, $<$, or $=$ to compare.



11. $\frac{3}{10} < \frac{3}{5}$ 12. $\frac{4}{5} > \frac{4}{10}$ 13. $\frac{5}{5} > \frac{5}{10}$ 14. $\frac{2}{5} < \frac{7}{10}$ 15. $\frac{8}{10} = \frac{4}{5}$

Complete **Daily Review** f on page 85.

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Math 4 Worktext, Chapter 3, Lesson 32

► What do you call a number that is written as a whole number and a fraction? **a mixed number**

► Is the mixed number $1\frac{1}{4}$ equivalent, or equal, to the improper fraction $\frac{5}{4}$? How do you know? **Yes; answers will vary, but elicit that they represent the same amount.**

Write =. Lead in reading the equivalent: $\frac{5}{4}$ equals $1\frac{1}{4}$.

6. Arrange the students in pairs and tell them to share the fraction pieces as needed. Repeat the procedure for $\frac{7}{4} = 1\frac{3}{4}$, $\frac{10}{4} = 2\frac{2}{4}$, $\frac{5}{3} = 1\frac{2}{3}$, and $\frac{8}{3} = 2\frac{2}{3}$.

Compare mixed numbers

1. Display the Mixed Numbers transparency.

► What mixed number is represented by the shaded parts of the circles on the left? $1\frac{2}{3}$

Write $1\frac{2}{3}$ on the answer line below the circles.

► What mixed number is represented by the shaded parts of the circles on the right? $2\frac{1}{3}$

Write $2\frac{1}{3}$ on the answer line.

2. Explain that when comparing mixed numbers, first you compare the whole numbers.

► How do the whole numbers compare? **1 is less than 2.**

► Since 1 is less than 2, do you think that you need to compare the fractions? Why? **Elicit that you do not need to because you already know that 1 is less than 2.**

► What math symbol completes this number sentence? **less than, <**

Write a less than sign (<) between the mixed numbers and lead in reading the number sentence: **1 and $\frac{2}{3}$ is less than 2 and $\frac{1}{3}$.**

3. Direct attention to the row of hexagons.

► What mixed number is represented by the shaded parts of the hexagons on the left? $1\frac{1}{6}$ Write $1\frac{1}{6}$.

► What mixed number is represented by the shaded parts of the hexagons on the right? $1\frac{5}{6}$ Write $1\frac{5}{6}$.

► Can you compare these mixed numbers just by comparing the whole numbers? Why? **No; the whole numbers are the same.**

4. Explain that when the whole numbers are the same, you must compare the fractions to determine which mixed number is larger.

► How do the fractions compare? **$\frac{1}{6}$ is less than $\frac{5}{6}$** How do you know? **Answers may vary, but elicit that when the denominators are the same, the lesser numerator represents the lesser fraction.**

► Since the whole numbers are the same and $\frac{1}{6}$ is less than $\frac{5}{6}$, what sign completes the number sentence? **less than, <**
Write a less than sign (<) and lead in reading the number sentence: **1 and $\frac{1}{6}$ is less than 1 and $\frac{5}{6}$.**

5. Repeat the procedure for the row of squares. **$1\frac{3}{4} > 1\frac{2}{4}$**

6. Follow a similar procedure as you guide the students in comparing the mixed numbers at the bottom of the transparency, without pictures.

$$3\frac{1}{4} > 2\frac{1}{4} \quad 4\frac{6}{7} < 9\frac{2}{7}$$

$$5\frac{2}{5} < 5\frac{3}{5} \quad 8\frac{5}{6} > 8\frac{1}{6}$$

$$10\frac{1}{4} > 7\frac{3}{4} \quad 2\frac{7}{10} < 2\frac{9}{10}$$



Worktext pages 77–78, 85 (f)