Subtraction with Renaming

Essential Question How can you rename a mixed number to help you subtract?

Common Core **Numbers and Operations— Fractions—4.NF.B.3c** *Also 4.MD.A.2*
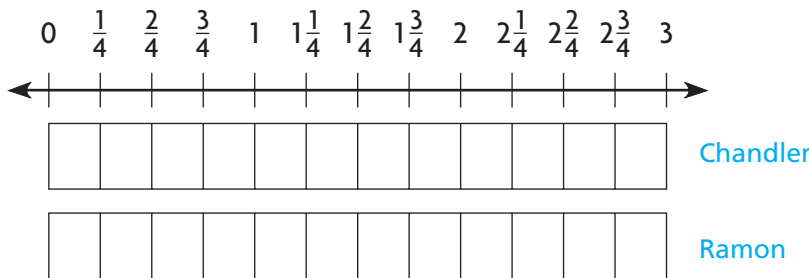
MATHEMATICAL PRACTICES
MP3, MP4

Unlock the Problem (Real World)

Ramon, Chandler, and Chase go bike riding on weekends. On one weekend, Chase rode his bike for 3 hours, Chandler rode her bike for $2\frac{1}{4}$ hours, and Ramon rode his bike for $1\frac{3}{4}$ hours. How much longer did Chandler ride her bike than Ramon did?

- Which operation will you use?

  _____

- In the problem, circle the numbers that you need to use to find a solution.

🔑 **Use a model. Find $2\frac{1}{4} - 1\frac{3}{4}$.**

Shade the model to show how long Chandler rode her bike.
Then shade the model to show how long Ramon rode his bike.

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

Chandler

Ramon

Think: The difference is _____.

So, Chandler rode her bike _____ hour longer than Ramon did.

1. If you have 1 fourth-size part, can you take away 3 fourth-size parts? Explain.

_____

_____

2. If you have 1 whole and 1 fourth-size part, can you take away 3 fourth-size parts? Explain.

_____

_____

Math Talk MATHEMATICAL PRACTICES ④

Use Models How can you use models to find how much longer Chase rode his bike than Chandler did?

🔑 One Way Rename the first mixed number.

Find the difference. $5\frac{1}{8} - 3\frac{3}{8}$

STEP 1

Rename $5\frac{1}{8}$ as a mixed number with a fraction greater than 1.

Think:

$$5\frac{1}{8} = 4 + 1 + \frac{1}{8}$$

$$= 4 + \frac{\boxed{}}{8} + \frac{1}{8}$$

$$= \boxed{}$$

STEP 2

Subtract the mixed numbers.

$$5\frac{1}{8} = \boxed{}$$

$$-3\frac{3}{8} = -3\frac{3}{8}$$

$$\boxed{}$$

Math Talk

MATHEMATICAL PRACTICES ⑦

Look for Structure
Explain why you need to rename $5\frac{1}{8}$.

🔑 Another Way Rename both mixed numbers.

Find the difference. $3\frac{4}{12} - 1\frac{6}{12}$

STEP 1

Rename both mixed numbers as fractions greater than 1.

$$3\frac{4}{12} = \frac{\boxed{}}{12} \qquad 1\frac{6}{12} = \frac{\boxed{}}{12}$$

STEP 2

Subtract the fractions greater than 1.

$$\frac{\boxed{}}{12}$$
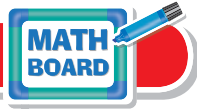
$$-\frac{\boxed{}}{12}$$

$$\boxed{}$$

- Explain how you could rename 5 to subtract $3\frac{1}{4}$.

Share and Show

1. Rename both mixed numbers as fractions. Find the difference.

$$3\frac{3}{6} = \frac{\boxed{}}{6}$$

$$-1\frac{4}{6} = -\frac{\boxed{}}{6}$$

Find the difference.

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

$-\frac{2}{3}$

3. $4\frac{7}{10}$

$-1\frac{9}{10}$

4. $3\frac{5}{12}$

$-\frac{8}{12}$

Math Talk

MATHEMATICAL PRACTICES ④

Model Mathematics
Describe how you would model $\frac{13}{6} - \frac{8}{6}$.

On Your Own

Find the difference.

5. $8\frac{1}{10}$

$-2\frac{9}{10}$

6. 2

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

7. $4\frac{1}{5}$

$-3\frac{2}{5}$

Practice: Copy and Solve **Find the difference.**

8. $4\frac{1}{6} - 2\frac{5}{6}$

9. $6\frac{9}{12} - 3\frac{10}{12}$

10. $3\frac{3}{10} - \frac{7}{10}$

11. $4 - 2\frac{3}{5}$

12. **GO DEEPER** Lisa mixed $4\frac{2}{6}$ cups of orange juice with $3\frac{1}{6}$ cups of pineapple juice to make fruit punch. She and her friends drank $3\frac{4}{6}$ cups of the punch. How much of the fruit punch is left?

Problem Solving • Applications *Real World*

Rename the fractions to solve.

Many instruments are coiled or curved so that they are easier for the musician to play, but they would be quite long if straightened out completely.

13. **MATHEMATICAL PRACTICE ①** **Analyze Relationships** Trumpets and cornets are brass instruments. Fully stretched out, the length of a trumpet is $5\frac{1}{4}$ feet and the length of a cornet is $4\frac{2}{4}$ feet. The trumpet is how much longer than the cornet?

_____

14. **THINK SMARTER** Tubas, trombones, and French horns are brass instruments. Fully stretched out, the length of a tuba is 18 feet, the length of a trombone is $9\frac{11}{12}$ feet, and the length of a French horn is $17\frac{1}{12}$ feet. The tuba is how much longer than the French horn? The French horn is how much longer than the trombone?

Math on the Spot

WRITE ▶ *Math* • **Show Your Work**

_____

15. **GO DEEPER** The pitch of a musical instrument is related to its length. In general, the greater the length of a musical instrument, the lower its pitch. Order the brass instruments identified on this page from lowest pitch to the highest pitch.

_____

Personal Math Trainer

16. **THINK SMARTER +** Alicia had $3\frac{1}{6}$ yards of fabric. After making a tablecloth, she had $1\frac{4}{6}$ yards of fabric. Alicia said she used $2\frac{3}{6}$ yards of fabric for the tablecloth. Do you agree? Explain.

_____

_____

_____

Subtraction with Renaming

Common Core **COMMON CORE STANDARD—4.NF.B.3c**
Build fractions from unit fractions by applying and extending previous understandings of operations on whole numbers.

Find the difference.

1. $5\frac{1}{3} \longrightarrow 4\frac{4}{3}$
$-3\frac{2}{3} \longrightarrow 3\frac{2}{3}$
$\overline{\qquad 1\frac{2}{3}}$

2. 6
$-3\frac{2}{5}$
$\overline{\qquad}$

3. $5\frac{1}{4}$
$-2\frac{3}{4}$
$\overline{\qquad}$

4. $9\frac{3}{8}$
$-8\frac{7}{8}$
$\overline{\qquad}$

5. $12\frac{3}{10}$
$-7\frac{7}{10}$
$\overline{\qquad}$

6. $8\frac{1}{6}$
$-3\frac{5}{6}$
$\overline{\qquad}$

7. $7\frac{3}{5}$
$-4\frac{4}{5}$
$\overline{\qquad}$

8. $10\frac{1}{2}$
$-8\frac{1}{2}$
$\overline{\qquad}$

9. $7\frac{1}{6}$
$-2\frac{5}{6}$
$\overline{\qquad}$

10. $9\frac{3}{12}$
$-4\frac{7}{12}$
$\overline{\qquad}$

11. $9\frac{1}{10}$
$-8\frac{7}{10}$
$\overline{\qquad}$

12. $9\frac{1}{3}$
$-\frac{2}{3}$
$\overline{\qquad}$

Problem Solving Real World

13. Alicia buys a 5-pound bag of rocks for a fish tank. She uses $1\frac{1}{8}$ pounds for a small fish bowl. How much is left?

_____

14. Xavier made 25 pounds of roasted almonds for a fair. He has $3\frac{1}{2}$ pounds left at the end of the fair. How many pounds of roasted almonds did he sell at the fair?

_____

15. **WRITE** ▸*Math* Explain when you know you need to rename a mixed number to subtract.

_____

_____

_____

Lesson Check

1. Reggie is making a double-layer cake. The recipe for the first layer calls for $2\frac{1}{4}$ cups of sugar. The recipe for the second layer calls for $1\frac{1}{4}$ cups of sugar. Reggie has 5 cups of sugar. How much will he have left after making both recipes?

_____

2. Kate has $4\frac{3}{8}$ yards of fabric and needs $2\frac{7}{8}$ yards to make a skirt. How much extra fabric will she have left after making the skirt?

_____

Spiral Review

3. Paulo has 128 glass beads to use to decorate picture frames. He wants to use the same number of beads on each frame. If he decorates 8 picture frames, how many beads will he put on each frame?

_____

4. Madison is making party favors. She wants to make enough favors so each guest gets the same number of favors. She knows there will be 6 or 8 guests at the party. What is the least number of party favors Madison should make?

_____

5. A shuttle bus makes 4 round-trips between two shopping centers each day. The bus holds 24 people. If the bus is full on each one-way trip, how many passengers are carried by the bus each day?

_____

6. To make a fruit salad, Marvin mixes $1\frac{3}{4}$ cups of diced peaches with $2\frac{1}{4}$ cups of diced pears. How many cups of peaches and pears are in the fruit salad?

_____

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Personal Math Trainer**