Lesson 7-10

Friday, December 13, 2019 10:52 AM

MB 425

Name

Lesson 7-10
Subtract Mixed Numbers

Solve & Share

Evan walks $2\frac{1}{8}$ miles to his aunt's house. He has already walked $\frac{3}{4}$ mile. How much farther does he have to go? *Solve this problem any way you choose.*

I can ...
subtract mixed numbers.

Content Standards 5.NF.A.1, 5.NF.A.2
Mathematical Practices MP.2, MP.3, MP.4, MP.6, MP.7

Use Structure
Use what you know about subtracting fractions. Show your work!

2 - 1 = 1

$2\frac{1}{8} - \frac{3}{4} = X$

$2\frac{1}{8}$ miles

$\frac{3}{4}$	x

$2\frac{1}{8} = 1\frac{1}{8} + \frac{8}{8} = 1\frac{9}{8}$

$-\frac{3}{4} \times 2 = \frac{6}{8} = -\frac{6}{8}$

$1\frac{3}{8}$

Evan needs to walk $1\frac{3}{8}$ mi farther

Look Back! MP.3 Critique Reasoning Jon said, "Changing $\frac{3}{4}$ to $\frac{6}{8}$ makes this problem easier." What do you think Jon meant?

Jon means that you must have common denominators to subtract fraction parts.

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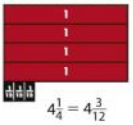
How Can You Subtract Mixed Numbers?

A golf ball measures about $1\frac{2}{3}$ inches across the center. What is the difference between the distance across the center of the hole and the golf ball?

You can use subtraction to find the difference.

Step 1

Write equivalent fractions with a common denominator.



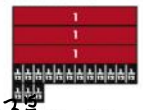
$4\frac{1}{4} = 4\frac{3}{12}$

$-\ 1\frac{2}{3} = 1\frac{8}{12}$

Since $\frac{8}{12} > \frac{3}{12}$, you can rename 1 as $\frac{12}{12}$ to subtract.

Step 2

Rename $4\frac{3}{12}$ to show more twelfths.



$4\frac{3}{12} = 3\frac{15}{12}$

$-\ 1\frac{8}{12} = 1\frac{8}{12}$

Step 3

Subtract the fractions. Then subtract the whole numbers.

$4\frac{1}{4} = 4\frac{3}{12} = 3\frac{15}{12}$

$-\ 1\frac{2}{3} = 1\frac{8}{12} = 1\frac{8}{12}$

$2\frac{7}{12}$

The hole is $2\frac{7}{12}$ inches wider.

Convince Me! MP.3 Critique Reasoning Estimate $8\frac{1}{3} - 3\frac{3}{4}$.

Tell how you got your estimate. Susi subtracted and found the actual difference to be $5\frac{7}{12}$. Is her answer reasonable? Explain.

Susi's answer was too far away to be reasonable. The actual answer is $4\frac{7}{12}$.

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Another Example

Sometimes you may have to rename a whole number to subtract.

Find the difference of $6 - 2\frac{3}{8}$.

$6 \longrightarrow$ rename $\longrightarrow 5\frac{8}{8}$

$-\ 2\frac{3}{8}$ $\qquad -\ 2\frac{3}{8}$

$3\frac{5}{8}$

Guided Practice

Do You Understand?

1. In the example above, why do you need to rename the 6?

2. MP.2 Reasoning In the example on page 426, could two golf balls fall into the hole at the same time? Explain your reasoning.

Do You Know How?

In **3–6**, estimate and then find each difference.

3. $7\frac{2}{3} = 7\frac{\square}{6} = 6\frac{\square}{6}$

$-\ 3\frac{5}{6} = 3\frac{\square}{6} = 3\frac{\square}{6}$

4. $5 = 5\frac{\square}{4}$

$-\ 2\frac{3}{4} = 2\frac{3}{4}$

5. $6\frac{3}{10} - 1\frac{4}{5}$

Complete 13, 22, 23

Independent Practice

In 7–18, estimate and then find each difference.

Remember to check that your answer makes sense by comparing it to the estimate.

7. $8\frac{1}{4} = 8\frac{\square}{8} = 7\frac{\square}{8}$
$-\ 2\frac{7}{8} = 2\frac{\square}{8} = 2\frac{\square}{8}$

8. $3\frac{1}{2} = 3\frac{\square}{6}$
$-\ 1\frac{1}{3} = 1\frac{\square}{6}$

9. $4\frac{1}{8}$
$-\ 1\frac{1}{2}$

10. 6
$-\ 2\frac{4}{5}$

11. $6\frac{1}{3} - 5\frac{2}{3}$

12. $9\frac{1}{2} - 6\frac{3}{4}$

13. $8\frac{3}{16} - 3\frac{5}{8}$

14. $7\frac{1}{2} - \frac{7}{10}$

15. $15\frac{1}{6} - 4\frac{3}{8}$

16. $13\frac{1}{12} - 8\frac{1}{4}$

17. $6\frac{1}{3} - 2\frac{3}{5}$

18. $10\frac{5}{12} - 4\frac{7}{8}$

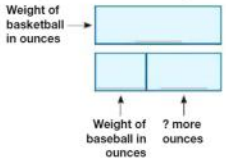
*For another example, see Set G on page 448.

$8 - 4 = 4$

$8\frac{3}{16} - 3\frac{5}{8} = 8\frac{3}{16} - 3\frac{5\times2}{8\times2} = 8\frac{3}{16} - 3\frac{10}{16} = 7\frac{3}{16} + \frac{16}{16} = 7\frac{19}{16} = 3\frac{10}{16} = 4\frac{9}{16}$

Math Practices and Problem Solving

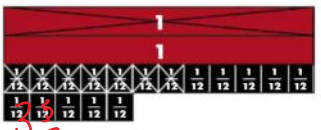
19. **MP.4 Model with Math** The average weight of a basketball is $21\frac{1}{10}$ ounces. The average weight of a baseball is $5\frac{1}{4}$ ounces. How many more ounces does the basketball weigh? Write the missing numbers in the diagram.



20. **Math and Science** The smallest mammals on Earth are the bumblebee bat and the Etruscan pygmy shrew. The length of a certain bumblebee bat is $1\frac{9}{50}$ inches. The length of a certain Etruscan pygmy shrew is $1\frac{21}{50}$ inches. How much smaller is the bat than the shrew?

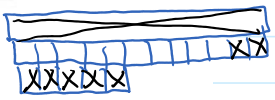
21. **MP.6 Be Precise** How are the purple quadrilateral and the green quadrilateral alike? How are they different?

22. **Higher Order Thinking** Sam used the model to find $2\frac{5}{12} - 1\frac{7}{12}$. Did Sam model the problem correctly? Explain. If not, show how the problem should have been modeled and find the difference.



Sam made a model of $3\frac{10}{12}$

$2\frac{5}{12} - 1\frac{7}{12} = \frac{10\div2}{12\div2} = \frac{5}{6}$



Common Core Assessment

23. Choose the correct number from the box below to complete the subtraction sentence that follows.

1	2	3	4	5

$3\frac{5}{8} - 1\frac{\square}{4} = 2\frac{3}{8}$

24. Choose the correct number from the box below to complete the subtraction sentence that follows.

2	4	5	10	15

$14\frac{1}{10} - 3\frac{1}{\square} = 10\frac{3}{5}$

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$3\frac{5}{8} - 1\frac{2}{8} = 2\frac{3}{8}$

$1\frac{2}{8}\div2 = 1\frac{1}{4}$