Lesson 7-1

Friday, December 13, 2019 9:55 AM

Name MB 371

Solve

Lesson 7-1
Estimate Sums and Differences of Fractions

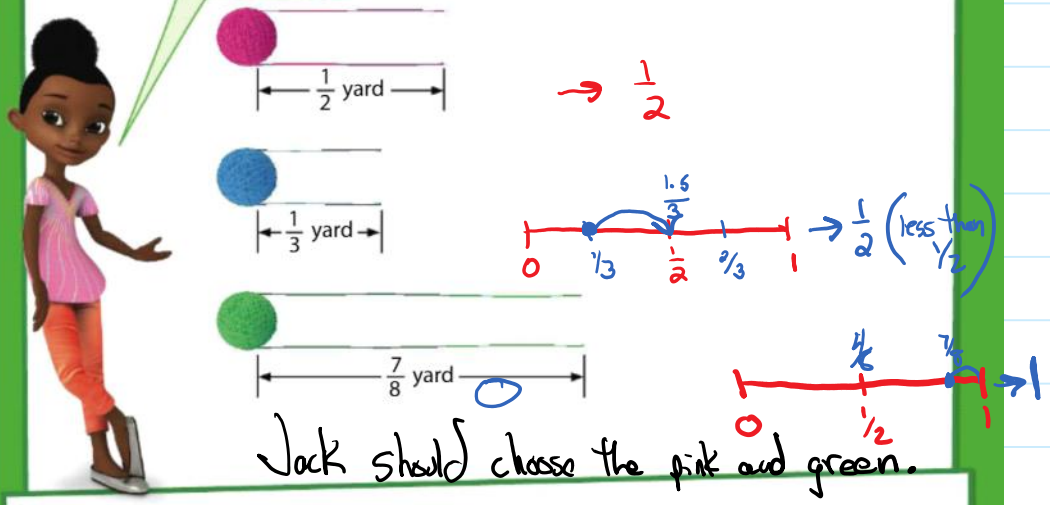
I can ...
estimate sums and differences of fractions.

Content Standards 5.NF.A.1, 5.NF.A.2
Mathematical Practices MP.2, MP.3, MP.8

Solve & Share

Jack needs about $1\frac{1}{2}$ yards of string. He has three pieces of string that are different lengths. Without finding the exact amount, which two pieces should he choose to get closest to $1\frac{1}{2}$ yards of string? *Solve this problem any way you choose.*

Reasoning You can use number sense to estimate the answer. *Show your work!*



→ $\frac{1}{2}$

1.6 $\frac{1}{3}$

0 $\frac{1}{3}$ $\frac{1}{2}$ $\frac{2}{3}$ 1 → $\frac{1}{2}$ (less than $\frac{1}{2}$)

$\frac{4}{8}$ $\frac{7}{8}$

0 $\frac{1}{2}$ 1

Jack should choose the pink and green.

Look Back! MP.8 Generalize How can a number line help you estimate?

A number line can show 0, $\frac{1}{2}$, and 1. Then you place a fraction on the number line to find if it is closer to 0, $\frac{1}{2}$, or 1.

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Learn Glossary

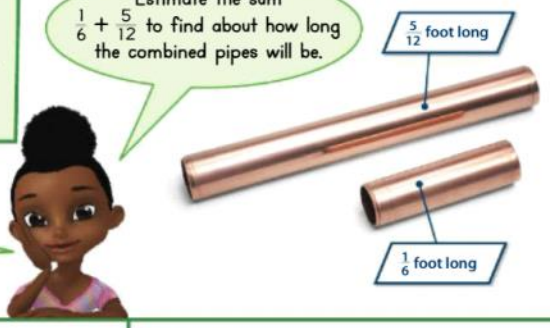
Essential Question

How Can You Estimate the Sum of Two Fractions?

A

Mr. Fish is welding together two copper pipes to repair a leak. He will use the pipes shown. Is the new pipe closer to $\frac{1}{2}$ foot or 1 foot long? Explain.

Estimate the sum $\frac{1}{6} + \frac{5}{12}$ to find about how long the combined pipes will be.

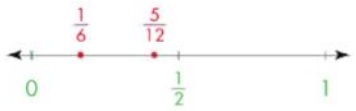


You can add to find the sum.

B

Step 1

Replace each fraction with the nearest half or whole. A number line can make it easy to decide if each fraction is closest to 0, $\frac{1}{2}$, or 1.



$\frac{1}{6}$ is between 0 and $\frac{1}{2}$, but is closer to 0.

$\frac{5}{12}$ is also between 0 and $\frac{1}{2}$, but is closer to the benchmark fraction $\frac{1}{2}$.

C

Step 2

Add to find the estimate.

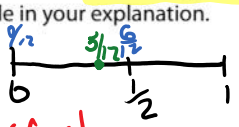
A good estimate of $\frac{1}{6} + \frac{5}{12}$ is $0 + \frac{1}{2}$, or $\frac{1}{2}$.

So, the welded pipes will be closer to $\frac{1}{2}$ foot than 1 foot long.

Since each addend is less than $\frac{1}{2}$, it is reasonable that their sum is less than 1.

Convince Me! MP.3 Critique Reasoning Nolini says that if the denominator is more than twice the numerator, the fraction can always be replaced with 0. Is she correct? Give an example in your explanation.

$\frac{5}{12}$ $(5 \times 2 = 10 \quad 12 > 10)$



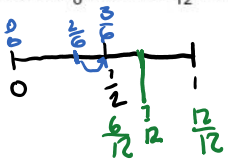
Nolini is incorrect. $\frac{5}{12}$ is replaced by $\frac{1}{2}$.

Name _____

Guided Practice

Do You Understand?

1. **MP.2 Reasoning** In the problem at the top of page 372, would you get the same estimate if Mr. Fish's pipes measured $\frac{2}{6}$ foot and $\frac{7}{12}$ foot?



$\frac{2}{6} + \frac{7}{12}$

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

Nope.

2. **Number Sense** If a fraction has a 1 in the numerator and a number greater than 2 in the denominator, will the fraction be closer to 0, $\frac{1}{2}$, or 1? Explain.

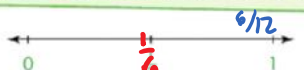
The fractions $\frac{1}{3}$ and $\frac{1}{4}$ round to $\frac{1}{2}$.

Fractions smaller than $\frac{1}{5}$ round to 0.

Do You Know How?

In **3** and **4**, use a number line to tell if each fraction is closest to 0, $\frac{1}{2}$, or 1. Then estimate the sum or difference.

3.



a $\frac{11}{12}$ Closest to: _____

b $\frac{1}{6}$ Closest to: _____

Estimate the sum $\frac{11}{12} + \frac{1}{6}$.

c 1 + _____ = _____

4.

a $\frac{14}{16}$ Closest to: _____

b $\frac{5}{8}$ Closest to: _____

Estimate the difference $\frac{14}{16} - \frac{5}{8}$.

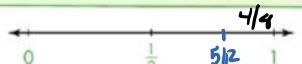
c _____ − _____ = _____

Complete 5, 7, 8 & 17

Independent Practice

Leveled Practice In **5**, use a number line to tell if each fraction is closest to 0, $\frac{1}{2}$, or 1. In **6–11**, estimate the sum or difference by replacing each fraction with 0, $\frac{1}{2}$, or 1.

5.



a $\frac{7}{8}$ Closest to: _____

b $\frac{5}{12}$ Closest to: _____

Estimate the difference $\frac{7}{8} - \frac{5}{12}$.

c _____ − _____ = _____

6. $\frac{9}{10} + \frac{5}{6}$

7. $\frac{11}{18} - \frac{2}{9}$

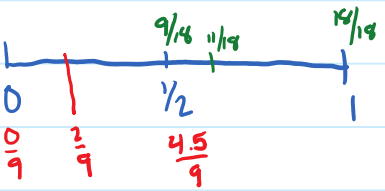
8. $\frac{1}{16} + \frac{2}{15}$

9. $\frac{24}{25} - \frac{1}{9}$

10. $\frac{3}{36} + \frac{1}{10}$

11. $\frac{37}{40} - \frac{26}{50}$

$\frac{1}{2} - 0 = \frac{1}{2}$



*For another example, see Set A on page 445.

Math Practices and Problem Solving

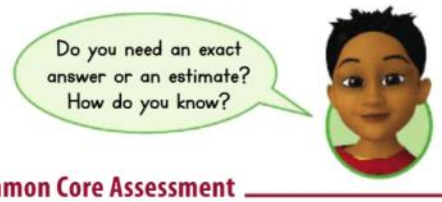
12. **Number Sense** Name two fractions that are closer to 1 than to $\frac{1}{2}$. Then, name two fractions that are closer to $\frac{1}{2}$ than to 0 or 1 and two other fractions that are closer to 0 than to $\frac{1}{2}$. Find two of your fractions that have a sum of about $1\frac{1}{2}$.

13. **Higher Order Thinking** How would you estimate whether $\frac{27}{50}$ is closer to $\frac{1}{2}$ or 1 without using a number line? Explain.

$\frac{25}{50} = \frac{1}{2}$ and $\frac{50}{50} = 1$. $\frac{27}{50}$ is closer to $\frac{25}{50}$ so it is closer to $\frac{1}{2}$ than 1.

14. Katie made a bag of trail mix with $\frac{1}{2}$ cup of raisins, $\frac{3}{5}$ cup of banana chips, and $\frac{3}{8}$ cup of peanuts. About how much trail mix did Katie make?

15. **MP.2 Reasoning** The Annual Mug Race is the longest river sailboat race in the world. The event is run along the St. Johns River, which is 310 miles long. About how many times as long as the race is the river?



Common Core Assessment

16. Draw lines to match each expression on the left to its estimate on the right.

$\frac{11}{12} - \frac{5}{6}$	0
$\frac{5}{9} - \frac{1}{10}$	$\frac{1}{2}$
$\frac{15}{16} - \frac{1}{12}$	1

17. Draw lines to match each expression on the left to its estimate on the right.

$\frac{1}{30} + \frac{4}{6}$	0
$\frac{8}{9} + \frac{1}{5}$	1
$\frac{2}{20} + \frac{1}{12}$	2

$0 + \frac{1}{2}$, $1 + 0$, $0 + 0$