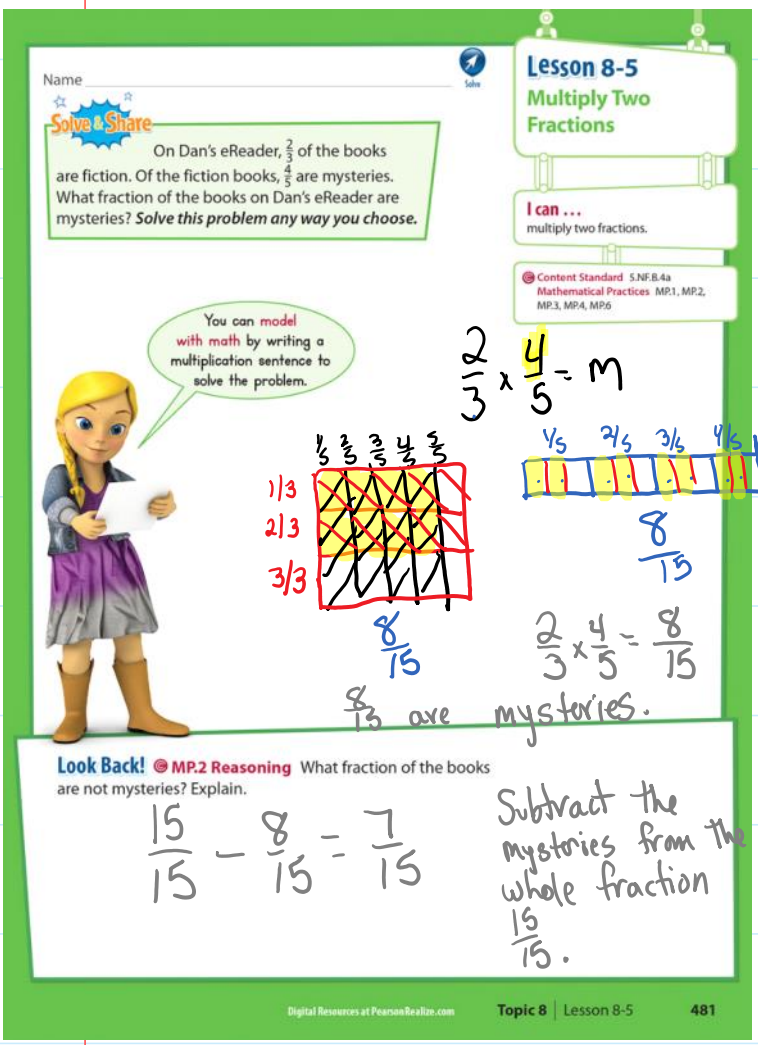
Lesson 8-5

Thursday, January 2, 2020 1:37 PM



Name _____

Lesson 8-5
Multiply Two Fractions

I can ...
multiply two fractions.

Content Standard 5.NF.B.4a
Mathematical Practices MP.1, MP.2, MP.3, MP.4, MP.6

Solve & Share

On Dan's eReader, $\frac{2}{3}$ of the books are fiction. Of the fiction books, $\frac{4}{5}$ are mysteries. What fraction of the books on Dan's eReader are mysteries? ***Solve this problem any way you choose.***

You can model with math by writing a multiplication sentence to solve the problem.

$\frac{2}{3} \times \frac{4}{5} = m$

1/5 2/5 3/5 4/5 5/5
1/3
2/3
3/3

$\frac{8}{15}$

1/5 2/5 3/5 4/5 5/5

$\frac{8}{15}$

$\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$

$\frac{8}{15}$ are mysteries.

Look Back! MP.2 Reasoning What fraction of the books are not mysteries? Explain.

$\frac{15}{15} - \frac{8}{15} = \frac{7}{15}$

Subtract the mysteries from the whole fraction $\frac{15}{15}$.

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How Can You Find the Product of Two Fractions?

Amelia takes pictures with her smartphone. Of the pictures, $\frac{5}{6}$ are of animals. What fraction of all her pictures are of dogs?

$\frac{3}{4}$ of her animal photos are of dogs.

You need to find $\frac{3}{4}$ of $\frac{5}{6}$ to answer the question.

Step 1

Estimate $\frac{3}{4} \times \frac{5}{6}$.

Since both fractions are less than 1, the product will be less than 1.

Step 2

Multiply the numerators together. Then multiply the denominators together.

$$\frac{3}{4} \times \frac{5}{6} = \frac{3 \times 5}{4 \times 6}$$
$$= \frac{15}{24}$$

Since $\frac{15}{24} < 1$, the answer is reasonable.

So, $\frac{15}{24}$ or $\frac{5}{8}$ of all Amelia's pictures have dogs in them.

$\frac{15}{24}$ and $\frac{5}{8}$ are equivalent fractions.

Convince Me! MP.4 Model with Math $\frac{1}{10}$ of the animal pictures on Amelia's smartphone are of cats. Write and solve an equation to find what fraction of all her pictures have cats in them.

$\frac{1}{10} \times \frac{5}{6} = \frac{5}{60} \div 5 = \frac{1}{12}$

$\frac{1}{12}$ are of cats.

Name _____

Guided Practice

Do You Understand?

1. MP.2 Reasoning Is the product of $\frac{3}{6} \times \frac{5}{4}$ equal to the product of $\frac{3}{4} \times \frac{5}{6}$? Explain how you know.

Yes, multiplying the same numbers as numerators and denominators has equal products

2. MP.3 Construct Arguments Why is adding $\frac{3}{9}$ and $\frac{6}{9}$ different from multiplying the two fractions? Explain.

X

Do You Know How?

In 3–10, find each product.

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

4. $\frac{5}{9}$ of $\frac{1}{9}$ 0 $= \frac{5}{81}$

5. $\frac{10}{10} \times \frac{1}{4}$

6. $\frac{21}{40} \times \frac{1}{4}$ $\frac{1\times1}{4\times10} \frac{7\times3}{2\times20} \frac{4\times0}{5\times8}$

7. $\frac{5}{6}$ of $\frac{3}{7}$

8. $\frac{3}{5} \times \frac{11}{12}$ $= \frac{33}{60} \div 3 = \frac{11}{20}$

$1\frac{2}{5} \times \frac{11}{12} = \frac{11}{20}$

9. $\frac{4}{10} \times \frac{2}{5}$

10. $\frac{8}{50} \div 2 = \frac{4}{25}$

$5\frac{4}{10} \times \frac{2}{5} = \frac{4}{25}$

Complete # 20, 24, 28, 33*, & 35

*Two Step Multiplication

Independent Practice

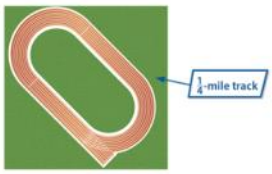
In **11–30**, find each product.

11. $\frac{9}{10} \times \frac{1}{2}$
12. $\frac{5}{6} \times \frac{1}{3}$
13. $\frac{4}{7}$ of $\frac{7}{9}$
14. $\frac{3}{4} \times \frac{4}{5}$
15. $\frac{2}{3} \times \frac{7}{8}$
16. $\frac{5}{6}$ of $\frac{11}{12}$
17. $\frac{1}{3}$ of $\frac{3}{4}$
18. $\frac{6}{7} \times \frac{3}{8}$
19. $\frac{2}{5}$ of $\frac{5}{12}$
20. $\frac{2}{3} \times \frac{4}{5}$
21. $\frac{8}{15} \times \frac{1}{2}$
22. $\frac{1}{2}$ of $\frac{8}{9}$
23. $\left(\frac{1}{6}+\frac{1}{6}\right) \times \frac{3}{4}$
24. $\left(\frac{3}{7}+\frac{2}{7}\right) \times \frac{2}{3}$
25. $\frac{1}{2} \times \left(\frac{1}{3}+\frac{1}{3}\right)$
26. $\left(\frac{9}{10}-\frac{3}{10}\right) \times \frac{1}{4}$
27. $\frac{2}{3} \times \left(\frac{3}{5}+\frac{1}{5}\right)$
28. $\left(\frac{8}{9}-\frac{1}{3}\right) \times \frac{3}{4}$
29. $\left(\frac{5}{12}+\frac{1}{6}\right) \times \frac{5}{6}$
30. $\frac{11}{12} \times \left(\frac{3}{4}-\frac{1}{2}\right)$

*For another example, see Set D on page 514.

Math Practices and Problem Solving

31. Eduardo runs 6 laps around the track at Lincoln Park School. Then he runs $3\frac{1}{2}$ miles to get home. How far will he run in all? Show your work.



32. **MP.6 Be Precise** To amend the U.S. Constitution, $\frac{3}{4}$ of the 50 states must approve the amendment. If 35 states approve an amendment, will the Constitution be amended?

33. **Higher Order Thinking** In Ms. Barclay's classroom, $\frac{2}{5}$ of the students play chess. Of the students who play chess, $\frac{5}{6}$ also play sudoku. If there are 30 students in her class, how many play chess and sudoku?

34. One sheet of stamps is shown at the right. Emma needs to buy 50 stamps to send out invitations for her graduation party. Will 2 sheets of stamps be enough? How do you know?

Common Core Assessment

35. Choose all the expressions that have $\frac{3}{4}$ as a product.

- ☐ $\frac{1}{2} \times \frac{1}{2}$
- ☐ $\frac{9}{10} \times \frac{5}{6}$
- ☐ $\frac{7}{8} \times \frac{6}{7}$
- ☐ $\frac{3}{4} \times \frac{3}{4}$
- ☐ $\frac{1}{4} \times \frac{1}{2}$

36. Choose all the multiplication sentences that have $\frac{1}{3}$ as the missing part.

- ☐ $\frac{4}{5} \times \frac{5}{12} = \square$
- ☐ $\frac{1}{4} \times \square = \frac{1}{6}$
- ☐ $\frac{7}{8} \times \square = \frac{7}{24}$
- ☐ $\frac{5}{6} \times \frac{2}{5} = \square$
- ☐ $\frac{1}{6} \times \frac{2}{3} = \square$

$1\frac{7}{48} \times \frac{\cancel{6}3}{\cancel{7}1} = \frac{3}{4}$