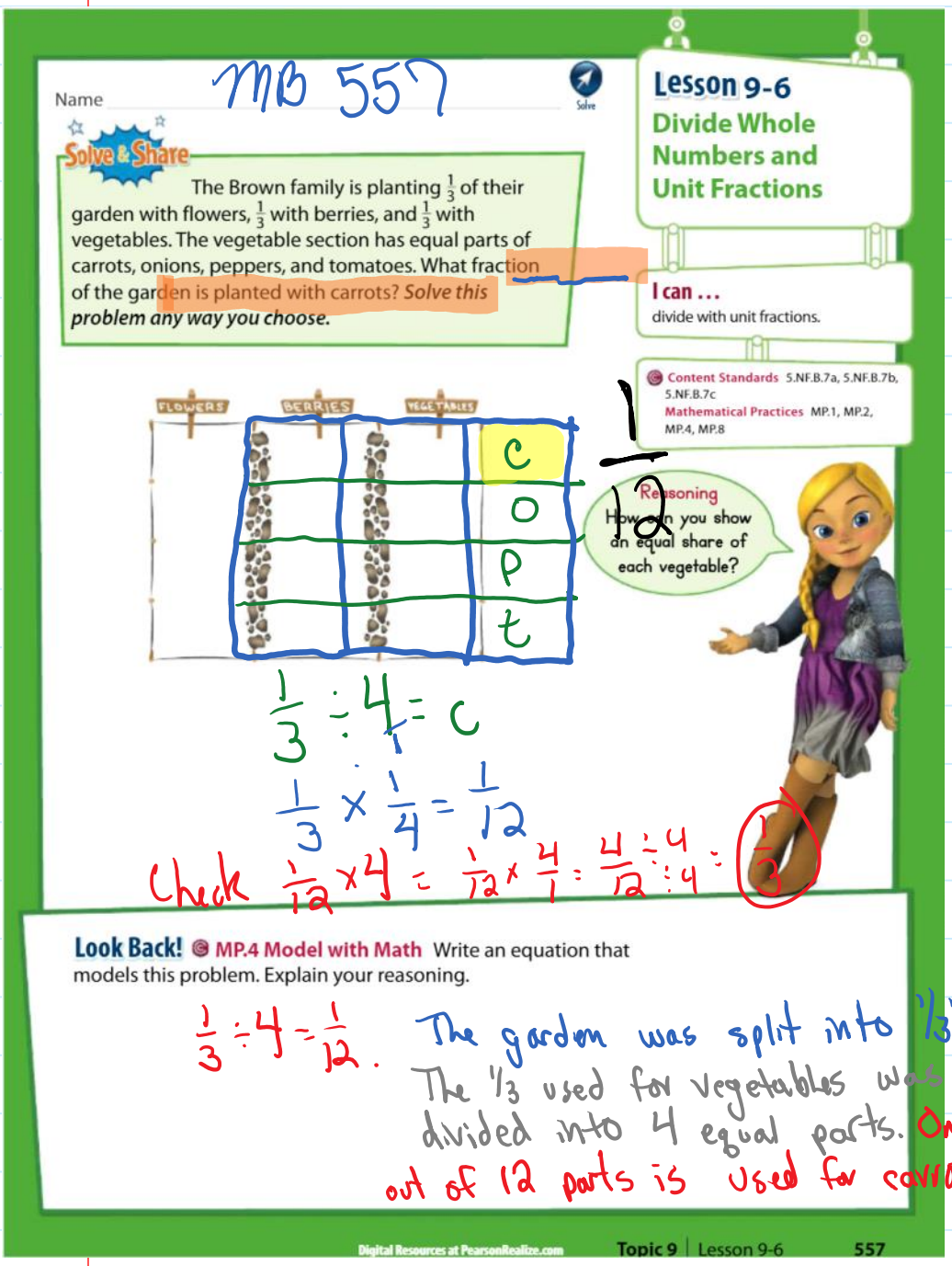
Lesson 9-6

Monday, February 3, 2020 2:16 PM



Name MB 557

Solve

Lesson 9-6
Divide Whole Numbers and Unit Fractions

Solve & Share

The Brown family is planting $\frac{1}{3}$ of their garden with flowers, $\frac{1}{3}$ with berries, and $\frac{1}{3}$ with vegetables. The vegetable section has equal parts of carrots, onions, peppers, and tomatoes. What fraction of the garden is planted with carrots? *Solve this problem any way you choose.*

I can ...
divide with unit fractions.

Content Standards 5.NF.B.7a, 5.NF.B.7b, 5.NF.B.7c
Mathematical Practices MP.1, MP.2, MP.4, MP.8

$\frac{1}{12}$

$\frac{1}{3} \div 4 = c$

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

Check $\frac{1}{12} \times 4 = \frac{1}{12} \times \frac{4}{1} = \frac{4}{12} \div 4 = \frac{1}{3}$

Look Back! MP.4 Model with Math Write an equation that models this problem. Explain your reasoning.

$\frac{1}{3} \div 4 = \frac{1}{12}$. The garden was split into 1/3's. The 1/3 used for vegetables was divided into 4 equal parts. One out of 12 parts is used for carrots.

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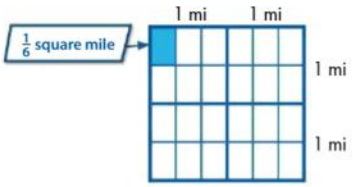
Essential Question: How Can You Divide with Unit Fractions and Whole Numbers?

A

A utility company is planning to install wind turbines on 4 square miles of land. Each turbine requires $\frac{1}{6}$ square mile of land. How many turbines can be installed?

B One Way

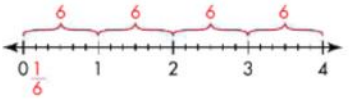
Use an area model to show 4 square miles. Divide each square mile into 6 equal parts to represent $\frac{1}{6}$ square mile.



There are 24 parts.
So, 24 wind turbines will fit on the land.

C Another Way

Use a number line to show 4 wholes.

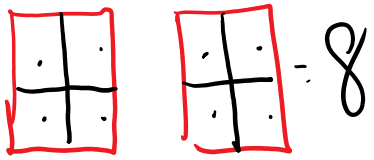


There are 6 $\frac{1}{6}$s in each whole.

So, there are 24 $\frac{1}{6}$s in 4 wholes.

24 wind turbines will fit on the land.

Convince Me! MP.4 Model with Math Use an area model to find $2 \div \frac{1}{4}$. Then use multiplication to check your answer.



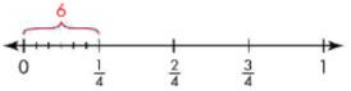
$\frac{8}{1} \times \frac{1}{4} = \frac{8}{4} = 2$

Name _____

Another Example

Use a number line to find $\frac{1}{4} \div 6$.

If you partition $\frac{1}{4}$ into 6 equal segments, how long is each segment?



$\frac{1}{4} \div 6 = \frac{1}{24}$

Check your answer using multiplication: $\frac{1}{24} \times 6 = \frac{1}{4}$.

Guided Practice*

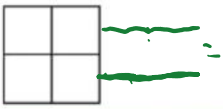
Do You Understand?

1. MP.8. Generalize When you divide a whole number by a fraction less than 1, will the quotient be greater than or less than the whole number?

Greater than

2. 4 square miles of land is separated into sections that each have an area of $\frac{1}{2}$ square mile. How many sections are there?

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



= 8

Do You Know How?

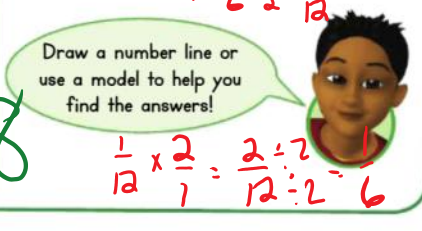
In 3–6, find each quotient.

3. $2 \div \frac{1}{4}$

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

5. $\frac{1}{6} \div 2$

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



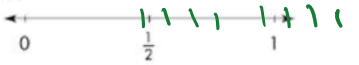
Complete: 8, 10, 14, & 15

Independent Practice

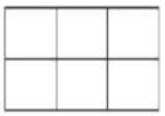
Leveled Practice In 7–10, find each quotient. Use a model or number line to help.

7. $5 \div \frac{1}{2}$

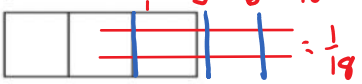
8. $5 \div 5$



9. $6 \div \frac{1}{3}$



10. $\frac{1}{3} \div 6$



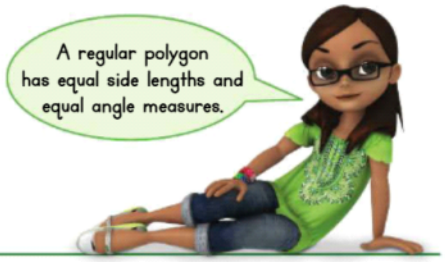
*For another example, see Set C on page 577.

Math Practices and Problem Solving

11. **MP.4 Model with Math** Keiko divided 5 cups of milk into $\frac{1}{4}$-cup portions. How many $\frac{1}{4}$-cup portions did Keiko have? Complete the picture to show your solution.

12. **Algebra** Ms. Allen has $\frac{1}{8}$ of a pan of brownies left to divide between 2 children. Draw a picture to find what fraction, *f*, of the original pan of brownies each child gets. Write an equation for *f* that models the solution.

13. A regular polygon has a perimeter of 2 feet. If each side measures $\frac{1}{3}$ foot, what is the name of the polygon?



14. **Higher Order Thinking** Mr. Brent uses $\frac{1}{4}$ cup of blue paint and $\frac{1}{4}$ cup of yellow paint to make each batch of green paint. How many batches of green paint can he make with the amount of paint he has left? Explain how you found your answer.

DATA

Paint Color	Amount Left
Blue	3 cups
Red	2 cups
Yellow	4 cups

– 3 cups

$3 \div \frac{1}{4} = p$ $3 \times \frac{4}{1} = \frac{3 \times 4}{1} = \frac{12}{1}$ 12 batches.

Mr. Brent can only use 3 cups of Blue and Yellow paint. $3 \div \frac{1}{4} = 12$ batches.

Common Core Assessment

15. Jordan says that $6 \div \frac{1}{2} = 3$. Is he correct? If not, justify your reasoning and give the correct quotient.

$6 \div \frac{1}{2} = \frac{6 \times 2}{1} = \frac{12}{1} = 12$

No. Dividing a whole number by a fraction gives a quotient greater than the dividend. $6 \div \frac{1}{2} = 12$.

$12 \times \frac{1}{2} = \frac{12}{2} = 6$