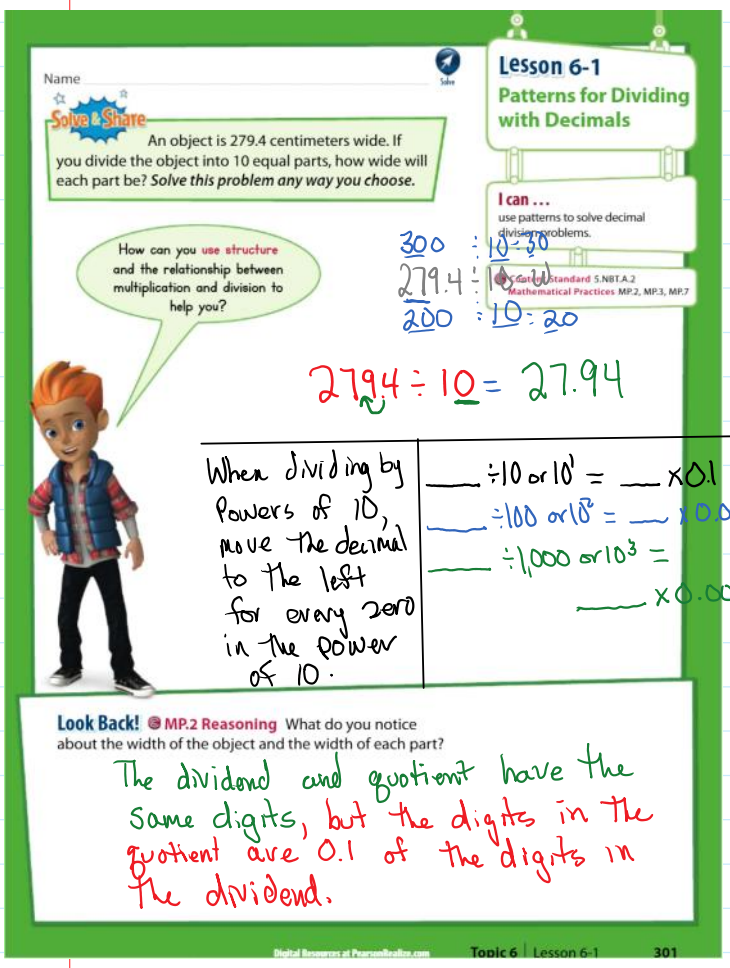
Lesson 6-1

Friday, January 11, 2019 8:37 AM



Name

Lesson 6-1
Patterns for Dividing with Decimals

Solve & Share
An object is 279.4 centimeters wide. If you divide the object into 10 equal parts, how wide will each part be? *Solve this problem any way you choose.*

I can ...
use patterns to solve decimal division problems.

Common Core Standard 5.NBT.A.2
Mathematical Practices MP.2, MP.3, MP.7

How can you use structure and the relationship between multiplication and division to help you?

300 ÷ 10 = 30
279.4 ÷ 10 = 27.94
200 ÷ 10 = 20

279.4 ÷ 10 = 27.94

When dividing by Powers of 10, move the decimal to the left for every zero in the power of 10.	___ ÷ 10 or 10^1 = ___ × 0.1 ___ ÷ 100 or 10^2 = ___ × 0.01 ___ ÷ 1,000 or 10^3 = ___ × 0.001

Look Back! MP.2 Reasoning What do you notice about the width of the object and the width of each part?

The dividend and quotient have the same digits, but the digits in the quotient are 0.1 of the digits in the dividend.

Digital Resources at PearsonRealize.com Topic 6 | Lesson 6-1 301

When the divisor is greater than 1 the quotient is smaller than the dividend.

When the divisor is equal to 1, the quotient is the same as the dividend.

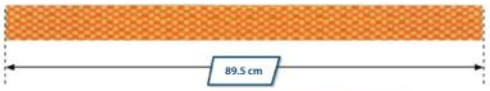
When the divisor is less than 1 the quotient is greater than the dividend.

How Can You Divide Decimals by Powers of 10?

Essential Question

A

Shondra wants to cut a cloth into 10 strips. All the strips should be exactly the same size. How long will each strip be?



B Find 89.5 ÷ 10.

A number divided by 10 is less than the number. Moving the decimal point to the left decreases the number's value.

Place value is based on 10, so dividing by 10 has the same result as moving the decimal point one place to the left.

C Notice the patterns in the table.

Divisor		
Standard Form	Exponential Form	Examples
1	10^0	89.5 ÷ 1 = 89.5
10	10^1	89.5 ÷ 10 = 8.95
100	10^2	89.5 ÷ 100 = 0.895
1,000	10^3	89.5 ÷ 1,000 = 0.0895

$89.5 \div 10^1 = 8.95$

Each cloth strip will be 8.95 centimeters long.

Convince Me! MP.7 Use Structure Suppose you have a rope that is 293.5 cm long. If you cut the rope into 10^1 equal pieces, how long would each piece be? If you cut the rope into 10^2 pieces, how long would each piece be? How are the quotients you found related?

300 ÷ 10 = 30
293.5 ÷ 10 = x 29.35
200 ÷ 10 = 20

300 ÷ 100 = 3
293.5 ÷ 10^2 = 2.935
200 ÷ 100 = 2

Name

Guided Practice

Do You Understand?

1. MP.7 Use Structure Suppose Shondra wanted to cut the cloth into 10^2 strips. How wide would each strip be?

89.5 ÷ 10^2 = 0.895

2. MP.3 Construct Arguments Krista divides a number by 10. Then she divides the same number by 50. Which quotient is greater? How can you tell?

x ÷ 10 or x ÷ 50
x ÷ 10 has a greater quotient because it has a smaller divisor so the pieces are bigger.

Do You Know How?

In **3–10**, use mental math to find each quotient.

3. 370.2 ÷ 10^2
4. 126.4 ÷ 10^1
5. 7.25 ÷ 10
6. 72.5 ÷ 10^3 0.0725
7. 281.4 ÷ 10^0 281.4 ÷ 1 = 281.4
8. 2,810 ÷ 10^4 0.2810 > 0.281
9. 3,642.4 ÷ 10^2
10. 364.24 ÷ 10^1

Complete 17, 20, 25, 30 & 31

Independent Practice

Leveled Practice In **11–25**, find each quotient. Use mental math.

11. $4{,}600 \div 10$
    $460 \div 10$
    $46 \div 10$
    $4.6 \div 10$

12. $134.4 \div 10^3$
    $134.4 \div 10^2$
    $134.4 \div 10^1$
    $134.4 \div 10^0$

13. $98.6 \div 1$
    $98.6 \div 100$
    $98.6 \div 10$
    $98.6 \div 1{,}000$

14. $136.5 \div 10$

15. $753 \div 100$

16. $890.1 \div 10^0$

17. $3.71 \div 10^2$

18. $8{,}100 \div 10^4$

19. $864 \div 10^3$

20. $0.52 \div 10^1$

21. $15.7 \div 1{,}000$

22. $7{,}700 \div 10^2$

23. $770 \div 10^2$

24. $77 \div 10^1$

25. $7.7 \div 10^1$

*For another example, see Set A on page 357.

Math Practices and Problem Solving

For **26–28**, use the table that shows the winning times at the Pacific Middle School swim meet.

DATA

50-yard freestyle	22.17 seconds
100-yard backstroke	53.83 seconds
100-yard butterfly	58.49 seconds

26. What was the difference between the winning butterfly time and the winning backstroke time?

27. The winning time for the 100-yard freestyle was twice the time for the 50-yard freestyle. What was the winning time for the 100-yard freestyle?

28. What was the difference between the winning 100-yard freestyle time and the winning butterfly time?

29. **MP.2 Reasoning** A pickup truck carrying 10^3 identical bricks weighs 6,755 pounds. If the empty truck weighs 6,240 pounds, what is the weight of each brick? Explain how to solve the problem.

30. **Higher Order Thinking** Katie noticed a pattern in the answers for each of the expressions below. What do you notice?

    14.6×0.1 = 1.46

    146×0.01 1.46

    146×0.001 0.146

    Multiplying 0.1, 0.01, and 0.001 is the same as dividing by 10, 100, and 1,000

Common Core Assessment

31. Choose the equations in which $n = 1{,}000$ makes the equation true.

- ☐ A. $2\_ \div n = 0.025$
- ☐ B. $9\_.5 \times n = 0.9475$
- ☐ C. $8\_.50 \times n = 8.35$
- ☐ D. $1\_.4 \times n = 0.0164$
- ☐ E. $0\_.7 \div n = 0.0057$

32. Choose the equations in which $d = 10^2$ makes the equation true.

- ☐ $386.2 \div d = 3.862$
- ☐ $1\_3.6 \div d = 4.9636$
- ☐ $0.6 \div d = 0.006$
- ☐ $5\_8 \div d = 0.58$
- ☐ $15.3 \div d = 0.153$