Lesson 5-4

Thursday, October 24, 2019 1:26 PM

Name

Lesson 5-4
Use Partial Quotients to Divide

Solve & Share
A hotel sets up tables for a conference for 156 people. If each table seats 12 people, how many tables will be needed? *Solve this problem any way you choose.*

I can ...
find quotients of whole numbers.

Content Standard 5.NBT.6.B
Mathematical Practices MP1, MP2, MP3, MP4, MP6, MP8

You can use estimation and reasoning to help solve this problem. Think about how many groups of 12 you can take away from 156. *Show your work!*

200 ÷ 10 = 20
156 ÷ 12 = t
100 ÷ 10 = 10

13 Tables

$$\begin{array}{r} 13 \\ 12\overline{)156} \\ -120 \\ \hline 36 \\ -36 \\ \hline 0 \end{array} \quad \begin{array}{l} 10+3=13 \\ =10\times12 \\ \\ =3\times12 \end{array}$$

Look Back! MP.8 Generalize How can you check that the answer to a division problem is correct?

Multiply the quotient and the divisor. The product should match the dividend.

$$\begin{array}{r} 13 \\ \times 12 \\ \hline 26 \\ +130 \\ \hline 156 \end{array}$$

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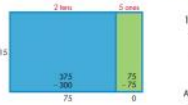
How Can You Use Partial Quotients to Solve Division Problems?

A theater has 375 seats arranged in rows with 15 seats in each row. How many rows are in this theater? Let r equal the number of rows.
Think: 15 × r = 375 or 375 ÷ 15 = r.

400 ÷ 20 = 20
375 ÷ 15 = r
200 ÷ 20 = 10

The area model can help you see the steps in dividing.



5
20
15|375 Estimate: How many 15s in 375? Try 20.
− 300 Multiply 20 by 15 and subtract.
75 Estimate: How many 15s in 75? Try 5.
− 75 Multiply 5 by 15 and subtract.
0 Stop when the difference is 0.

Add the partial quotients: 20 + 5 = 25.
375 ÷ 15 = 25
So, there are 25 rows in the theater.

Convince Me! MP.3 Critique Reasoning Dinah's solution to the problem above is shown at the right. Is her solution correct? Explain.

Yes, Dinah used two 10s as partial products instead of one 20. The quotient 10+10+5 still equals 25.

3 25
10 x 15
10 x 15
5 x 15

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Guided Practice

Do You Understand?
1. Show one way of using partial quotients to find 231 ÷ 11.
2. How can you use estimation to check that your answer to Problem 1 is reasonable?

The estimates have quotients of 30 and 20 and 21 is close.

Do You Know How?
In 3–6, use partial quotients to divide. Show your work.
3. 15|210
4. 13|286
5. 25|575
6. 32|960

① 300 ÷ 10 = 30
231 ÷ 11 = x
200 ÷ 10 = 20

$$\begin{array}{r} 21 \\ 11\overline{)231} \\ -220 \\ \hline 11 \\ -11 \\ \hline 0 \end{array} \quad \begin{array}{l} 20 \\ =11\times20 \\ \\ =11\times1 \\ \\ 3 \end{array}$$

11 × 20 = 220

21 × 11 = 21 + 210 = 231

④ 300 ÷ 10 = 30
286 ÷ 13 = x
200 ÷ 10 = 20

$$\begin{array}{r} 22 \\ 13\overline{)286} \\ -260 \\ \hline 26 \\ -26 \\ \hline 0 \end{array} \quad \begin{array}{l} 20 \\ =20\times13 \\ \\ =2\times13 \\ \\ 2 \end{array}$$

13 × 20 = 260

22 × 13 = 66 + 220 = 286

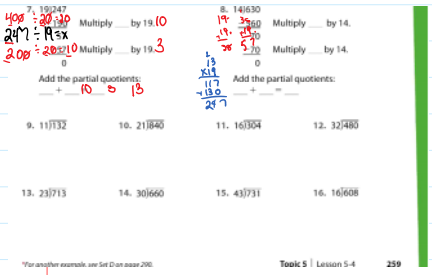
Independent Practice

Leveled Practice In 7–16, use partial quotients to divide. Show your work.

7. 19|247
408 ÷ 20 = 20
247 ÷ 19 = x
200 ÷ 20 = 10
Multiply ___ by 19. 10
Multiply ___ by 19. 3
Add the partial quotients: ___ + ___ 10 5 13

8. 14|630
Multiply ___ by 14.
Multiply ___ by 14.
Add the partial quotients: ___ + ___ = ___

C. 1000 ÷ 30 = 40 30



7. 19)247 — Multiply ___ by 19. 10
Multiply ___ by 19. 3
Add the partial quotients: ___ + ___ = 10 5 13

8. 14)630 — Multiply ___ by 14.
Multiply ___ by 14.
Add the partial quotients: ___ + ___ = ___

9. 11)132 10. 21)840 11. 16)304 12. 32)480

13. 23)713 14. 30)660 15. 43)731 16. 16)608

*For another example, see Set D on page 200.

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Math Practices and Problem Solving*

17. A 969-acre wildlife preserve has 19 cheetahs. About how many acres does each cheetah have to itself, if each cheetah roams the same number of acres?

18. **MP.6 Be Precise** A factory produces 272 chairs in an 8-hour shift. If the factory produces the same number of chairs each hour, how many chairs does it produce in 30 minutes?

19. A cafeteria can seat 5×10^2 students. Each table has 2×10^1 seats. How many tables are in the cafeteria?

20. **MP.4 Model with Math** Peter is driving 992 miles from Chicago to Dallas. His sister Anna is driving 1,068 miles from Phoenix to Dallas. Write and solve an equation to find how much farther Anna drives than Peter drives.

21. **MP.1 Make Sense and Persevere** Write a multiplication equation and a division equation that represent the model shown below.

22. **Higher Order Thinking** How can you use partial quotients to find 325 ÷ 13? Explain.

Multiply 20 by 13 and subtract 260 from 325. Then multiply 5 by 13 and subtract 65 from 65. Add 20 and 5 to get the quotient 25.

Common Core Assessment

23. Which expressions are equivalent to 35?
- ☐ 1,400 ÷ 40
- ☐ 420 ÷ 10
- ☐ 875 ÷ 25
- ☐ 7,700 ÷ 22
- ☐ 14,000 ÷ 40

24. Which expressions are equivalent to 22?
- ☐ 704 ÷ 32
- ☐ 1,078 ÷ 49
- ☐ 1,890 ÷ 30
- ☐ 1,430 ÷ 65
- ☐ 4,500 ÷ 50

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Checks

0

286

⑥ 120 ÷ 30 = 40
960 ÷ 32 = X
900 ÷ 30 = 30

30
32)960
-960
0

32
x30
960

Complete # 7, 22, & 23

400 ÷ 10 = 40
325 ÷ 13 = X
300 ÷ 10 = 30

5
20 = 25
13)325
-260 13x20
-65 13x5
0

13 x30 390
13 x20 260

13 26 39 52
+13 +13 +13
26 39 52 65

25
x13
75
+250
325

35
35 x4 120 +350
35 x12 70 +700
35 x25 175
35 x22 770 < X
x 40 1400