3 Develop the Concept: Visual

ELL STRATEGY Visual Learning

Visual Learning

Estimating Quotients

How can you estimate quotients?

Jorge is putting shells into 6 boxes. He wants to put about the same number in each box. About how many shells could Jorge put in each box?

Choose an Operation Divide to separate an amount into equal groups.

How could you find exactly how many shells Jorge could put in each box? [Divide the number of shells by the number of boxes; 258 ÷ 6.] *How do you know you can estimate to solve this problem?* [The word "about" means that you don't need an exact answer.]

1 Visual Learning

Set the Purpose Call students' attention to the **Visual Learning Bridge** at the top of the page. *In this lesson, you will learn how to use rounding and compatible numbers to estimate quotients of whole numbers.*

2 Guided Practice

Formative Assessment

Remind students that they can use either rounding or compatible numbers to solve these problems. Tell them that different estimation methods may give different answers.

Exercise 2

Error Intervention

If students use compatible numbers that are not close to the original problem,

then say: *List the first 10 multiples of the divisor, starting with 1 × 8, 2 × 8, 3 × 8, . . . Which are the two closest multiples to 44?* [5 × 8 and 6 × 8]

Reteaching First, model using compatible numbers to estimate the quotient of 460 ÷ 5 [450 ÷ 5]. Then, model rounding to estimate the quotient of 460 ÷ 5 [500 ÷ 5]. For another example and more practice, assign **Reteaching** Set B on p. 116.

3 Independent Practice

Remind students that compatible numbers are related to basic division facts. Use Exercise 26 as an example. *Both 36 and 45 are multiples of 9. The number 37 is between 36 and 45, so you can choose either 360 or 450 as compatible with 9. The underestimate of 360, however, would be a better choice because it is closer to 378. You can use mental math to find 360 ÷ 9.*

Lesson 4-2

Understand It! There is more than one way to estimate quotients.

Estimating Quotients

How can you estimate quotients?

Jorge is putting shells into 6 boxes. He wants to put about the same number in each box. About how many shells could Jorge put in each box?

Choose an Operation Divide to separate an amount into equal groups.

9. Sample answer: 258 was rounded up to 300, so 50 is an overestimate.

Guided Practice*

Do you know HOW?

In **1** through **8**, estimate each quotient. Sample answers given.

1. 520 ÷ 4 — 500 ÷ 4 = 125
2. 444 ÷ 8 — 400 ÷ 8 = 50
3. 640 ÷ 6 — 660 ÷ 6 = 110
4. 310 ÷ 5 — 300 ÷ 5 = 60
5. 683 ÷ 2 — 700 ÷ 2 = 350
6. 297 ÷ 3 — 300 ÷ 3 = 100
7. 700 ÷ 9 — 720 ÷ 9 = 80
8. 507 ÷ 7 — 490 ÷ 7 = 70

Do you UNDERSTAND?

9. **Reasonableness** In the rounding example above, how do you know the actual quotient should be less than 50? See above.
10. In the example above, about how many shells could Jorge put into each box if he had 8 boxes? About 30

Independent Practice

In **11** through **22**, use rounding to estimate each quotient. Sample answers given.

11. 312 ÷ 5 — 300 ÷ 5 = 60
12. 792 ÷ 4 — 800 ÷ 4 = 200
13. 834 ÷ 2 — 800 ÷ 2 = 400
14. 518 ÷ 4 — 500 ÷ 4 = 125
15. 586 ÷ 5 — 600 ÷ 5 = 120
16. 419 ÷ 7 — 420 ÷ 7 = 60
17. 635 ÷ 8 — 640 ÷ 8 = 80
18. 287 ÷ 2 — 300 ÷ 2 = 150
19. 975 ÷ 5 — 1,000 ÷ 5 = 200
20. 359 ÷ 6 — 360 ÷ 6 = 60
21. 695 ÷ 7 — 700 ÷ 7 = 100
22. 187 ÷ 4 — 200 ÷ 4 = 50

In **23** through **34**, use compatible numbers to estimate each quotient. Sample answers given.

23. 263 ÷ 3 — 300 ÷ 3 = 100
24. 317 ÷ 7 — 350 ÷ 7 = 50
25. 477 ÷ 6 — 480 ÷ 6 = 80
26. 378 ÷ 9 — 360 ÷ 9 = 40
27. 641 ÷ 6 — 660 ÷ 6 = 110
28. 433 ÷ 4 — 400 ÷ 4 = 100
29. 256 ÷ 3 — 270 ÷ 3 = 90
30. 182 ÷ 7 — 210 ÷ 7 = 30
31. 545 ÷ 8 — 560 ÷ 8 = 70
32. 239 ÷ 5 — 250 ÷ 5 = 50
33. 772 ÷ 7 — 770 ÷ 7 = 110
34. 324 ÷ 8 — 320 ÷ 8 = 40

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