


Lesson 3-2 (Goldman Absent)

Tuesday, October 19, 2021 3:44 PM

Name _____ 

Solve & Share

A school club wants to buy shirts for each of its 38 members. Each shirt costs \$23. About how much money will all the shirts cost? *Solve this problem any way you choose.*

Lesson 3-2
Estimate Products

I can ...
estimate products using mental math.

Content Standard 5.NBT.B.5
Mathematical Practices MP.1, MP.2, MP.3

Reasoning Are you asked for an exact answer or an estimate?

Rounding:
Round to the greatest place value:
 $23 \times 38 = 5$
 $20 \times 40 = 800$
about \$800.

* You may need to find the exact answer to state if this is an over or underestimate


Compatible Numbers
 $23 \times 38 = x$
 $25 \times 40 = 1000$
about \$1,000

Overestimate - both factors are greater than the original factors.

Look Back! **MP.3 Construct Arguments** How can you use number sense to tell that the exact answer has to be greater than \$600? Explain how you know.

23×38
 $20 \times 36 = 600$

Both factors were estimated lower than the original factors. The product is an underestimate so the exact answer will be greater than \$600.



A store needs at least \$15,000 in sales per month to make a profit. If the store is open every day in March and sales average \$525 per day, will the store make a profit in March?

You can use rounding to estimate.



Is the sales total for March at least \$15,000?

Use Rounding to Estimate

\$525 rounds to \$500.

31 rounds to 30.

Find 30×500 .

$$30 \times 500 = 15,000$$

You know that $3 \times 5 = 15$.

Both numbers used to estimate were less than the actual numbers, so 15,000 is an underestimate. The store will actually have more than \$15,000 worth of sales.

So, the store will make a profit in March.

Convince Me! **MP.3 Critique Reasoning** A different store needs to make at least \$20,000 to make a profit in March. They average \$685 a day for the month. James used rounding and estimation to say, "685 is almost \$700. $\$700 \times 30$ days is \$21,000. I think it is going to be a close call!" What do you think?

I agree with James. I think it will be a close call since the estimate is only a little greater than the amount needed.

Another Example

Estimate 24×398 .

25 and 4 are compatible numbers because their product is easy to compute mentally.

$$25 \times 4 = 100$$

$$25 \times 40 = 1,000$$

$$25 \times 400 = 10,000$$

So, 10,000 is a good estimate for 24×398 .

You can also use compatible numbers to estimate.



Both numbers used to estimate were greater than the actual numbers.

So, 10,000 is an **overestimate**.

Guided Practice

Do You Understand?

- Number Sense** Each egg carton holds one dozen eggs. Michael's chicken farm fills 121 egg cartons. He thinks that there were over 1,500 eggs. Is he correct? Use an estimate to find out.

$12 \times 121 = e$
 $10 \times 100 = 1,000$ or $12 \times 120 = 1,440$
 about 1,000 eggs about 1,440 eggs
 No, Michael is not correct.

Do You Know How?

In 2–5, estimate. Then, tell if your estimate is an overestimate or underestimate.

- 29×688
 $30 \times 700 = 21,000$ overestimate
- 210×733
 $200 \times 700 = 140,000$ underestimate
- 43×108
 $40 \times 100 = 4,000$ underestimate
- 380×690
 $400 \times 700 = 280,000$ overestimate

Complete: 6, 17, 22, 24

- 180×586

$200 \times 600 = 120,000$
 Overestimate

14. 25×191

15. 408×676

16. 290×12

17. 854×733

$900 \times 700 = 630,000$

* Because one factor rounds up and one factor rounds down you would need the exact product to tell if it's an over or under estimate.

☆ Math Practice and Problem Solving ☆

22. **Higher Order Thinking** Abby counts 12 large boxes and 18 small boxes of pencils in the supply cabinet. Each large box contains 144 pencils. Each small box contains 24 pencils. Estimate the total number of pencils. Is your estimate an overestimate or an underestimate? Explain why it might be better to have an underestimate rather than an overestimate.

$(12 \times 144) + (18 \times 24) = P$
 $(10 \times 100) + (20 \times 20) = P$
 $1,000 + 400 = 1,400$
 About 1,400 pencils.
 underestimate

It is better to have an underestimate to make sure you have enough pencils.

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23. **MP.3 Critique Reasoning** Susan used rounding to estimate 24×413 and found 20×400 . Jeremy used compatible numbers and found 25×400 . Whose method gives an estimate closer to the actual product? Explain.



Is your answer reasonable?

24. Lance has 102 packages of sports cards. Each package has 28 cards. Use rounding to estimate. About how many cards does Lance have?

- (A) 2,000
- (B) 2,500
- (C) 3,000
- (D) 3,500

$102 \times 28 = C$
 $100 \times 30 = 3,000$
 (C)

25. Which does NOT show a reasonable estimate of 24×338 ?

- (A) 6,000
- (B) 7,000
- (C) 7,500
- (D) 10,000