

Name _____

Estimate Products

Essential Question How can you estimate products by rounding and determine if exact answers are reasonable?



Number and Operations in Base Ten—4.NBT.B.5 Also 4.NBT.A.3

MATHEMATICAL PRACTICES
MP1, MP6, MP7, MP8



Unlock the Problem



An elephant can reach as high as 23 feet with its trunk. It uses its trunk to pick up objects that weigh up to 3 times as much as a 165-pound person. About how much weight can an African elephant pick up with its trunk?

- Cross out the information you will not use.
- Circle the numbers you will use.
- How will you use the numbers to solve the problem?

One Way Estimate by rounding.

STEP 1 Round the greater factor to the nearest hundred.

$$\begin{array}{r} 3 \times 165 \\ \downarrow \\ 3 \times 200 \end{array}$$

STEP 2 Use mental math.

$$\begin{array}{l} \text{Think: } 3 \times 200 = 3 \times 2 \text{ hundreds} \\ = 6 \text{ hundreds} \\ = \underline{\hspace{2cm}} \end{array}$$

So, an African elephant can pick up about 600 pounds with its trunk.

Another Way Estimate by finding two numbers the exact answer is between.

$$\begin{array}{r} 3 \times 165 \\ \downarrow \\ 3 \times 100 = \underline{\hspace{2cm}} \end{array}$$

$$\begin{array}{r} 3 \times 165 \\ \downarrow \\ 3 \times 200 = \underline{\hspace{2cm}} \end{array}$$

Think: 165 is between 100 and 200. Use those numbers to estimate.

So, the African elephant can pick up between 300 and 600 pounds.



An African elephant is the largest living land mammal.

1. Is 200 less than or greater than 165? _____
2. So, would the product of 3 and 165 be less than or greater than 600? _____



MATHEMATICAL PRACTICES 6

Compare Is the exact answer closer to 300 or 600? Why?

Describe Reasonableness You can estimate a product to find whether an exact answer is reasonable.

Key Tell whether an exact answer is reasonable.

Eva's horse eats 86 pounds each week. Eva solved the equation below to find how much feed she needs for 4 weeks.

$$4 \times 86 = \blacksquare$$

Eva says she needs 344 pounds of feed. Is her answer reasonable?

One Way Estimate.

$$4 \times 86$$

↓ Think: Round to the nearest ten.

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

344 is close to 360.

Another Way Find two numbers the exact answer is between.

$$4 \times 86$$

↓

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

$$4 \times 86$$

↓

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

$\underline{\quad}$ is between $\underline{\quad}$ and $\underline{\quad}$.

So, 344 pounds of feed is reasonable.



Share and Show



1. Estimate the product by rounding.

$$5 \times 2,213$$

↓

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

2. Estimate the product by finding two numbers the exact answer is between.

$$5 \times 2,213$$

↓

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

$$5 \times 2,213$$

↓

$$\underline{\quad} \times \underline{\quad} = \underline{\quad}$$

Math Talk

MATHEMATICAL PRACTICES 6

How do you know that an exact answer of 11,065 is reasonable? **Explain.**

Name _____

Tell whether the exact answer is reasonable.

3. Kira needs to make color copies of a horse show flyer. The printer can make 24 copies in 1 minute. Kira says the printer makes 114 copies in 6 minutes.

4. Jones Elementary is having a car wash to raise money for a community horse trail. Each car wash ticket costs \$8. Tiara says the school will receive \$1,000 if 125 tickets are sold.

On Your Own

Tell whether the exact answer is reasonable.

5. **MATHEMATICAL PRACTICE 1 Evaluate Reasonableness**
Mrs. Hense sells a roll of coastal Bermuda horse hay for \$58. She says she will make \$174 if she sells 3 rolls.

6. Mr. Brown sells horse supplies. A pair of riding gloves sells for \$16. He says he will make \$144 if he sells 9 pairs.

7. **GO DEEPER** Path A and Path B are walking paths used for horses. Path A is 118 feet long. Path B is 180 feet long. Carlos walks his horse down each path 3 times. Which path did Carlos use to walk his horse about 500 feet? Explain.

8. **THINK SMARTER** Students in the third grade sell 265 tickets to the school play. Students in the fourth grade sell 3 times as many tickets as the third grade students. Estimate the number of tickets the fourth grade students sold by finding the two numbers the exact answer is between.

The students sold between

0	300
300	600
600	900
800	1,200

and _____ tickets.

Connect to Reading

Make Predictions

As you read a story, you make predictions about what might happen next or about how the story will end.

When you solve a math problem, you make predictions about what your answer might be.

An *estimate* is a prediction because it helps you to determine whether your answer is correct. For some problems, it is helpful to make two estimates—one that is less than the exact answer and one that is greater.

Predict whether the exact answer will be *less than* or *greater than* the estimate. Explain your answer.

9. **THINK SMARTER** The food stand at the zoo sold 2,514 pounds of hamburger last month. The average cost of a pound of hamburger is \$2. Jeremy estimates that about \$6,000 worth of hamburger was sold last month.

10. **GO DEEPER** A zoo bought 2,240 pounds of fresh food for the bears this month. The average cost of a pound of food is \$4. Jeremy estimates that about \$8,000 was spent on fresh food for the bears this month.



Name _____

Estimate Products



COMMON CORE STANDARD—4.NBT.B.5
Use place value understanding and properties of operations to perform multi-digit arithmetic.

Estimate the product by rounding.

1. 4×472

4×472



4×500

2,000

2. $2 \times 6,254$

3. 9×54

4. $5 \times 5,503$

Find two numbers the exact answer is between.

5. 3×567

6. $6 \times 7,381$

7. 4×94

8. 8×684

Problem Solving



9. Isaac drinks 8 glasses of water each day. He says he will drink 2,920 glasses of water in a year that has 365 days. Is the exact answer reasonable? **Explain.**

10. Most Americans throw away about 1,365 pounds of trash each year. Is it reasonable to estimate that Americans throw away over 10,000 pounds of trash in 5 years? **Explain.**

11. **WRITE** *Math* Describe a real-life multiplication situation for which an estimate makes sense.

Lesson Check (4.NBT.B.5)

1. A theater has 4,650 seats. If the theater sells all the tickets for each of its 5 shows, about how many tickets will the theater sell?

2. Washington Elementary has 4,358 students. Jefferson High School has 3 times as many students as Washington Elementary. About how many students does Jefferson High School have?

Spiral Review (4.OA.A.1, 4.NBT.A.3, 4.NBT.B.4, 4.NBT.B.5)

3. Diego has 4 times as many autographed baseballs as Melanie has. Diego has 24 autographed baseballs. How many autographed baseballs does Melanie have?

4. Mr. Turkowski bought 4 boxes of envelopes at the office supply store. Each box has 500 envelopes. How many envelopes did Mr. Turkowski buy?

5. Pennsylvania has a land area of 44,816 square miles. What is the land area of Pennsylvania rounded to the nearest hundred?

6. The table shows the types of DVDs customers rented from Sunshine Movie Rentals last year.

Movie Rentals	
Type	Number Rented
Comedy	6,720
Drama	4,032
Action	5,540

How many comedy and action movies were rented last year?

