LESSON MAKER PRO

Fraction Sense Check

Estimate products, then decide which answers make sense.

GRADE 5 · 5.NOS.D.11.a

5.NOS.D.11.a "Estimate products by reasoning about benchmark numbers and assess reasonableness of answers (e.g., 3/4 × 2 will be less than 2 because I am creating a fractional part of 2)."

NAME _____ DATE _____

ESTIMATE, THEN CHECK

To estimate a fraction times a whole number, replace the fraction with a nearby benchmark, such as 1/2 or 1. Multiply using the benchmark. If the fraction is less than 1, the exact product must be less than the whole number.

WORKED EXAMPLE

Estimate $4/5 \times 25$ using 1 as a benchmark. Then check your estimate.

1. 4/5 is close to 1.
2. Estimate: $1 \times 25 = 25$.
3. The exact product must be less than 25 because 4/5 is less than 1.
4. Check: $4/5 \times 25 = 20$.

Answer: About 25; the exact product is 20.

PRACTICE 6 problems

1 Use 1/2 as a benchmark to estimate $5/12 \times 36$.

ANSWER _____

2 Use 1 as a benchmark to estimate $9/10 \times 40$.

ANSWER _____

3 Use 1/2 as a benchmark to estimate $3/8 \times 32$.

ANSWER _____

4 Is 25 a reasonable answer for $6/7 \times 21$? Use a benchmark or a bound to explain.

ANSWER _____

5 Is 8 a reasonable answer for $2/3 \times 27$? Use 1/2 as a benchmark to explain.

ANSWER _____

6 Is 26 a reasonable estimate for $5/6 \times 30$? Explain using a benchmark.

ANSWER _____

APPLY IT Show your work

1 A game club has 48 minutes for activities. It spends 11/12 of that time solving a puzzle. Use 1 as a benchmark to estimate the puzzle time. Then find the exact time. Is 50 minutes a reasonable answer?

WORK SPACE

ANSWER _____

2 A student uses 5/8 of a pack of 32 stickers to decorate a notebook. Use 1/2 as a benchmark to estimate how many stickers the student uses. Then find the exact number. Is 19 stickers a reasonable estimate?

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two students estimate 7/8 × 64. One says 60, and the other says 70. Which estimate is reasonable? Explain using a benchmark, then find the exact product.

WORK SPACE AND ANSWER

ANSWER KEY

Fraction Sense Check

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Use 1/2 as a benchmark to estimate 5/12 × 36.	**About 18.**
2	Use 1 as a benchmark to estimate 9/10 × 40.	**About 40.**
3	Use 1/2 as a benchmark to estimate 3/8 × 32.	**About 16.**
4	Is 25 a reasonable answer for 6/7 × 21? Use a benchmark or a bound to explain.	**No. Since 6/7 is less than 1, the product must be less than 21.**
5	Is 8 a reasonable answer for 2/3 × 27? Use 1/2 as a benchmark to explain.	**No. Since 2/3 is greater than 1/2, the product is greater than 13 1/2.**
6	Is 26 a reasonable estimate for 5/6 × 30? Explain using a benchmark.	**Yes. Since 5/6 is close to 1, the product should be near but below 30. The exact product is 25.**

PART 2 · APPLY IT

1. **Estimate: about 48 minutes. Exact time: 44 minutes. No, 50 minutes is not reasonable.** The benchmark gives 1 × 48 = 48 minutes. The exact time is 11/12 × 48 = 44 minutes, and a fraction of 48 minutes cannot be more than 48 minutes.
2. **Estimate: about 16 stickers. Exact number: 20 stickers. Yes, 19 stickers is reasonable.** The benchmark gives 1/2 × 32 = 16 stickers. The exact number is 5/8 × 32 = 20 stickers, so 19 is close.

CHALLENGE

60 is reasonable. Since 7/8 is close to 1 but less than 1, the product should be near but below 64. The exact product is 56, so 70 is too large.

Accept estimates written without the word "about." For reasonableness questions, accept other valid explanations that compare the product with a benchmark or the whole-number factor.