LESSON MAKER PRO

Product Sense

Use benchmarks to estimate and check products.

GRADE 4 · 4.NOS.E.13.a

4.NOS.E.13.a "Estimate products by reasoning about benchmark numbers and assess reasonableness of answers (e.g., 4 × 1/2 will be less than 4 because I have 4 groups of something less than 1)."

NAME _____ DATE _____

ESTIMATE, THEN CHECK

Compare a fraction to 0, 1/2, and 1. Multiply by the closest benchmark to estimate the product. If you multiply a whole number by a fraction less than 1, the product must be less than that whole number.

WORKED EXAMPLE

Estimate 13 × 11/12. A student says the product is 15. Is that reasonable?

1. 11/12 is closest to 1.
2. 13 × 1 = 13, so the product is about 13.
3. The product must be less than 13 because 11/12 is less than 1.

Answer: About 13; 15 is not reasonable.

PRACTICE 6 problems

1 Estimate 4 × 1/10 using the closest benchmark: 0, 1/2, or 1.

ANSWER _____

2 Estimate 6 × 3/5 using the closest benchmark: 0, 1/2, or 1.

ANSWER _____

3 Estimate 5 × 4/5 using the closest benchmark: 0, 1/2, or 1.

ANSWER _____

4 A student says 3 × 2/3 is 4. Is that reasonable? Use a benchmark to explain.

ANSWER _____

5 Estimate 10 × 5/9 using the closest benchmark: 0, 1/2, or 1.

ANSWER _____

6 A student says 7 × 9/10 is about 7. Is that a reasonable estimate? Use a benchmark to explain.

ANSWER _____

APPLY IT Show your work

1 You make 6 friendship bracelets. Each bracelet needs 4/5 yard of string. Use a benchmark to estimate the total string needed. Is 8 yards a reasonable total? Explain.

WORK SPACE

ANSWER _____

2 A playlist has 20 songs. Of those, 2/5 are upbeat. Use a benchmark to estimate how many songs are upbeat. Is 18 a reasonable answer? Explain.

WORK SPACE

ANSWER _____

CHALLENGE One step up

Two students estimate 16 × 5/8. One estimates 8, and the other estimates 16. Which estimate uses the closer benchmark? Is 14 a reasonable answer? Use 3/4 as another benchmark to explain.

WORK SPACE AND ANSWER

ANSWER KEY

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PART 1 · PRACTICE

#	PROBLEM	ANSWER
1	Estimate 4 × 1/10 using the closest benchmark: 0, 1/2, or 1.	**About 0**
2	Estimate 6 × 3/5 using the closest benchmark: 0, 1/2, or 1.	**About 3**
3	Estimate 5 × 4/5 using the closest benchmark: 0, 1/2, or 1.	**About 5**
4	A student says 3 × 2/3 is 4. Is that reasonable? Use a benchmark to explain.	**No. 2/3 is closest to 1/2, so the product is about 1 1/2. It cannot be greater than 3.**
5	Estimate 10 × 5/9 using the closest benchmark: 0, 1/2, or 1.	**About 5**
6	A student says 7 × 9/10 is about 7. Is that a reasonable estimate? Use a benchmark to explain.	**Yes. 9/10 is closest to 1, and 7 × 1 = 7.**

PART 2 · APPLY IT

1. **About 6 yards; 8 yards is not reasonable because the total must be less than 6 yards.** 4/5 is closest to 1, so estimate 6 × 1 = 6 yards. Since each bracelet needs less than 1 yard, 6 bracelets need less than 6 yards.
2. **About 10 songs; 18 is not reasonable because fewer than half the songs are upbeat.** 2/5 is closest to 1/2, so estimate 20 × 1/2 = 10 songs. Since 2/5 is less than 1/2, the actual number is less than 10.

CHALLENGE

8 uses the closer benchmark because 5/8 is closer to 1/2 than to 1. No, 14 is not reasonable: 5/8 is less than 3/4, so the product is less than 16 × 3/4 = 12.

Accept equivalent explanations that identify the closest benchmark. The exact product in the challenge is 10.