



Fraction Division Fix-It: Carrot Sticks, Granola Bars, and Garden Plots

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Lesson:

Read the passages and examples below. Two examples show correct work and three show a common mistake: multiplying when you should divide, or flipping the wrong number. For every answer, check the size: sharing one piece among more people makes each piece smaller; counting how many small pieces fit into wholes makes the number bigger.



Start with what you already know about division. Division can show equal sharing or how many groups fit. If 12 carrot sticks are shared among 3 students, each student gets 4 carrot sticks. That is a whole-number division situation.

A unit fraction means one equal part of a whole, like $\frac{1}{4}$ or $\frac{1}{6}$. When you divide a unit fraction by a whole number, you are splitting one small piece into more equal parts. The parts get smaller, not larger.

For example, $\frac{1}{2}$ of a granola bar split among 2 friends makes 2 equal pieces from the half. Each friend gets $\frac{1}{4}$ of the whole granola bar, because one half split into 2 equal parts makes fourths.

Correct work: $\frac{1}{3} \div 3 = \frac{1}{9}$. One third split into 3 equal parts makes ninths; each part is $\frac{1}{9}$ of the whole.

Incorrect work: $\frac{1}{5} \div 2 = \frac{2}{5}$. This is wrong because splitting one fifth into 2 equal parts makes smaller pieces. The correct answer is $\frac{1}{10}$.

One fifth split into 2 parts

$\frac{1}{5}$



$\frac{2}{5}$



$\frac{1}{10}$



The claimed answer $\frac{2}{5}$ is bigger than $\frac{1}{5}$. Splitting makes pieces smaller: the correct answer $\frac{1}{10}$ is the shortest bar.

When you divide a whole number by a unit fraction, you ask how many unit-fraction pieces fit into the whole. If 3 garden plots are each split into $\frac{1}{2}$ -plot sections, there are 6 half-plot sections in all.

Incorrect work: $3 \div \frac{1}{4} = \frac{3}{4}$. This is wrong because 3 contains twelve fourths, so dividing by $\frac{1}{4}$ makes the number bigger. The correct answer is 12.

Incorrect work: $3 \div \frac{1}{2} = 1.5$. This is wrong because the student divided by 2 instead of asking how many halves fit. 3 contains six halves, so the correct answer is 6.

How many halves fit in 3?

3 wholes: 3



3 wholes contain six $\frac{1}{2}$ -size pieces. Dividing by a unit fraction asks how many pieces fit.

Correct work: $2 \div \frac{1}{6} = 12$. Two wholes each contain six sixths, so twelve sixths fit in all.

A common mistake is to multiply when you should divide, or to flip the wrong number. Careful readers check the story first: Are you sharing one piece among more groups, or counting how many small pieces fit into a whole?

Use the meaning of the problem to choose the operation. Then check whether the answer should be smaller than the original amount or larger than it.

Instructions:

Read each worked example carefully. Find the mistake, then give the correct number. Use the story to decide whether the answer should get smaller or larger.

1. Compute: $\frac{1}{2} \div 4 = ?$

Answer: _____

2. A garden has 3 plots. Each plot is split into $\frac{1}{3}$ -plot sections. How many $\frac{1}{3}$ -plot sections are there in all?

Answer: _____

3. Error analysis: A student says $\frac{1}{3} \div 2 = \frac{2}{3}$. What is the correct answer?

Answer: _____

4. Error analysis: A student says $2 \div \frac{1}{4} = \frac{1}{2}$ because 2 is cut in half. What is the correct answer?

Answer: _____

5. A snack box has $\frac{1}{2}$ of a granola bar. The half is shared equally by 4 friends. What fraction of a WHOLE granola bar does each friend get?

Answer: _____

6. Compare these two answers. Which is larger: $\frac{1}{2} \div 3$ or $\frac{1}{2} \div 6$? Enter the larger value.

Answer: _____

7. A garden plan says 2 plots are each split into $\frac{1}{4}$ -plot sections. How many sections are there?

Answer: _____

8. Explain the error: A student says $\frac{1}{4} \div 2 = \frac{1}{2}$ because the answer got bigger. What is the correct answer?

Answer: _____

9. Error analysis: A student says $3 \div \frac{1}{3} = 1$. What is the correct answer?

Answer: _____

10. Explain the mistake: A student says $\frac{1}{3} \div 2 = \frac{2}{6}$ because they multiplied top and bottom by 2. What is the correct answer?

Answer: _____

11. Compare these two amounts. Which is larger: $2 \div \frac{1}{4}$ or $2 \div \frac{1}{2}$? Enter the larger value.

Fraction bars

$\frac{1}{4}$



$\frac{1}{2}$



The two divisors compared: a $\frac{1}{4}$ piece and a $\frac{1}{2}$ piece of the same whole.

Answer: _____



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(Answer Key)

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1. Compute: $\frac{1}{2} \div 4 = ?$

Hint: Think: one half shared among 4 groups makes smaller pieces.

Correct Answer: 0.125

Explanation: One half split into 4 equal parts makes $\frac{1}{8}$. The correct answer is 0.125.

2. A garden has 3 plots. Each plot is split into $\frac{1}{3}$ -plot sections. How many $\frac{1}{3}$ -plot sections are there in all?

Hint: Each whole plot has 3 third-sized sections.

Correct Answer: 9

Explanation: 3 plots split into thirds makes 9 third-sized sections. The answer is 9.

3. Error analysis: A student says $\frac{1}{3} \div 2 = \frac{2}{3}$. What is the correct answer?

Hint: Splitting one third into 2 equal parts makes smaller pieces.

Correct Answer: 0.1667

Explanation: The student multiplied instead of dividing. One third split into 2 equal parts is $\frac{1}{6}$, which is 0.1667.

4. Error analysis: A student says $2 \div \frac{1}{4} = \frac{1}{2}$ because 2 is cut in half. What is the correct answer?

Hint: Dividing by $\frac{1}{4}$ asks how many fourths fit into 2.

Correct Answer: 8

Explanation: The student changed the operation into halving. Two wholes contain 8 fourths, so the answer is 8.

5. A snack box has $\frac{1}{2}$ of a granola bar. The half is shared equally by 4 friends. What fraction of a WHOLE granola bar does each friend get?

Hint: You are splitting one half into 4 equal parts.

Correct Answer: 0.125

Explanation: Sharing $\frac{1}{2}$ of a bar equally by 4 friends means each friend gets $\frac{1}{8}$ of the whole bar.

6. Compare these two answers. Which is larger: $\frac{1}{2} \div 3$ or $\frac{1}{2} \div 6$? Enter the larger value.

Hint: Both start with one half.

Correct Answer: 0.1667

Explanation: $\frac{1}{2} \div 3 = \frac{1}{6}$, and $\frac{1}{2} \div 6 = \frac{1}{12}$. The larger value is $\frac{1}{6}$, or 0.1667.

7. A garden plan says 2 plots are each split into $\frac{1}{4}$ -plot sections. How many sections are there?

Hint: Each plot has 4 quarter-plot sections.

Correct Answer: 8

Explanation: Two plots split into fourths makes 8 sections. The answer is 8.

8. Explain the error: A student says $\frac{1}{4} \div 2 = \frac{1}{2}$ because the answer got bigger. What is the correct answer?

Hint: Dividing one small piece among more people makes smaller pieces.

Correct Answer: 0.125

Explanation: The answer should be smaller, not bigger. One fourth divided by 2 is $\frac{1}{8}$, which is 0.125.

9. Error analysis: A student says $3 \div \frac{1}{3} = 1$. What is the correct answer?

Hint: Count how many thirds fit in 3 wholes.

Correct Answer: 9

Explanation: The student used too small a number. Three wholes contain 9 one-third pieces, so the answer is 9.

10. Explain the mistake: A student says $\frac{1}{3} \div 2 = \frac{2}{6}$ because they multiplied top and bottom by 2. What is the correct answer?

Hint: Dividing by 2 means split into 2 equal parts.

Correct Answer: 0.1667

Explanation: Multiplying top and bottom does not solve this division problem. One third split into 2 equal parts is $\frac{1}{6}$, or 0.1667.

11. Compare these two amounts. Which is larger: $2 \div \frac{1}{4}$ or $2 \div \frac{1}{2}$? Enter the larger value.

Hint: A smaller unit fraction makes more pieces fit.

Correct Answer: 8

Explanation: $2 \div \frac{1}{4} = 8$, and $2 \div \frac{1}{2} = 4$. The larger value is 8.