



Community Garden Planner

Mission: The community garden committee divides the land again and again: part for vegetables, then part of that for tomatoes. Use an area model to find what fraction of the WHOLE garden each crop gets.

Big question: How does an area model show multiplying a fraction by a fraction?

★ Warm-up: Quick sketch

Draw a rectangle for each. Shade and answer.

Shade $\frac{1}{2}$ of a rectangle. Then shade $\frac{1}{2}$ of that half. What part of the whole is double-shaded? ✓ **$\frac{1}{4}$.**

What is half of a half of a pizza? ✓ **$\frac{1}{4}$ of the pizza.**

Key vocabulary

Area model	A rectangle split into parts to show multiplication.
Product	The answer to a multiplication problem.
"Of"	In math, " $\frac{2}{3}$ of $\frac{3}{4}$ " means $\frac{2}{3} \times \frac{3}{4}$.
Overlap	Where the two shadings cross.

1 Box 1

Tomato land

In the simulator: Now cut into 3 rows and shade 2 rows ($\frac{2}{3}$ of the vegetable land).

What fraction of the WHOLE garden is tomatoes?

Answer: _____ ✓ **0.5**

2 Box 2

Find the shortcut

How do the 6 tomato squares and 12 total squares connect to $\frac{3}{4} \times \frac{2}{3}$?

☐ $3 \times 2 = 6$ squares and $4 \times 3 = 12$ squares ☐ $3 + 2 = 6$ ☐ $4 + 3 = 12 \times 1$

✓ **$3 \times 2 = 6$ squares and $4 \times 3 = 12$ squares**

3 Box 3

Garden 2

In the simulator: Model $\frac{3}{5}$ of $\frac{1}{2}$ for sunflowers.

What fraction of the whole garden is sunflowers?

Answer: _____ ✓ **0.3**

4 Box 4

Garden 3

In the simulator: Model $\frac{1}{4}$ of $\frac{5}{6}$ for carrots.

What fraction of the whole garden is carrots?

Answer: _____ ✓ **0.20833333333333334**

5 Box 5

Smaller than both

In every garden, the product was smaller than BOTH fractions. Why?

- ☐ You take a part of a part, so it keeps shrinking ☐ Multiplication always makes numbers smaller
☐ The garden got smaller

✓ You take a part of a part, so it keeps shrinking

6 Box 6

Legend: backwards 🏆 Legend only

Tomatoes are $\frac{1}{6}$ of the whole garden and they got $\frac{1}{2}$ of the vegetable land. What fraction of the garden is vegetables?

- ☐ $\frac{1}{3}$ ☐ $\frac{1}{12}$ ☐ $\frac{2}{3}$ ☐ $\frac{1}{2}$

✓ $\frac{1}{3}$

7 Box 7

Committee report

Explain to the committee how the area model shows $\frac{2}{3} \times \frac{3}{4} = \frac{6}{12}$.

Look for: Mentions columns; Mentions rows; Explains the overlap is the answer

Exit ticket: answer the big question in your own words

How does an area model show multiplying a fraction by a fraction?

Look for: To find a fraction of a fraction, shade the first fraction with columns and the second with rows. The overlap is the product. The number of overlap squares is the numerator (numerator $\times$ numerator), and the total squares is the denominator (denominator $\times$ denominator).

Completion codes

Students see a code like **ABC-I3** when they finish. The first part must match below. The letter is the level (E = Explorer, I = Investigator, L = Legend), and the number at the end is how many stars they earned.

Level	Code starts with
🗑 Explorer	VZ1-E
🔍 Investigator	PKK-I
🏆 Legend	ZKT-L

! Watch for these misconceptions

- "Add the tops and add the bottoms." $\frac{1}{2} + \frac{1}{3}$ is not $\frac{2}{5}$.
- "Multiplying always makes a number bigger." Multiplying by a fraction less than 1 makes it smaller.
- "You need a common denominator to multiply." Only for adding and subtracting.