Partitioning Shapes into Equal Areas

Apply the skill to decisions and designs

Name _____ **Date** _____ **Score** _____ / 6

QUICK REVIEW

Equal-area parts cover the same amount of surface, even if their shapes differ. Divide the total area by the number of equal parts. One of n equal parts covers $\frac{1}{n}$ of the whole. Unequal parts do not give equal shares.

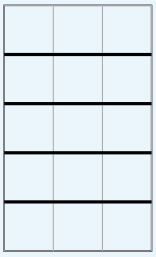
Worked example

The garden has five equal horizontal strips. How many unit squares are in one strip, and what fraction is it?

1. The 5 rows each contain 3 squares, for $5 \times 3 = 15$ in all.

2. One strip holds $15 \div 5 = 3$ squares. It is one of 5 equal parts, or $\frac{1}{5}$.

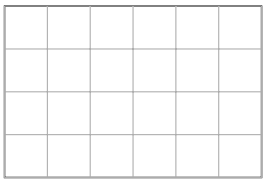
Answer: 3 square units; $\frac{1}{5}$ of the garden.



Practice Problems

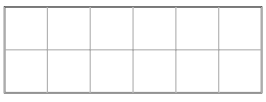
Show your thinking.

1. 3 children share this rectangular garden equally. Draw each child's area and give the unit fraction and square-unit area per child.



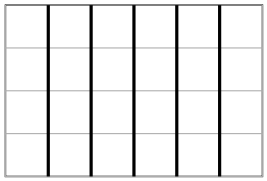
2. Three garden patches each cover 4 squares. Five unused squares are available. Can you make a fourth equal-area patch from them? If so, how many squares are left and what fraction of the four-patch garden is one patch?

3. Draw one diagonal to split this rectangle into two equal-area triangles. Name each triangle as a fraction and find its area.

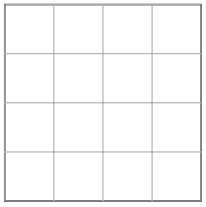


4. A class wants four equal areas using whole tiles. Its board is 3 tiles by 5 tiles. Can it divide those tiles fairly among four groups? Would adding one tile allow it? Give the area and fraction of one new group.

5. Six equal garden beds are shown. Shade any two full beds for a team. What fraction of the whole garden is one bed? What fraction is the team's share?



6. First split the rectangle into two equal areas. Then split each half into two equal areas. How many final parts are there, and what unit fraction and area does each have?



Answer Key

1. $\frac{1}{3}$ of the garden; 8 square units each.

2. Yes; 1 square left. One patch is $\frac{1}{4}$ of the four-patch garden.

3. Each is $\frac{1}{2}$; 6 square units.

4. Not with 15 tiles. With one more, each group has 4 tiles and is $\frac{1}{4}$ of the total.

5. One bed is $\frac{1}{6}$; the share is $\frac{2}{6} = \frac{1}{3}$.

6. 4 parts, each $\frac{1}{4}$ and 4 square units.

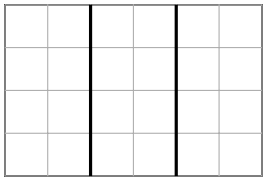
Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. The garden contains $6 \times 4 = 24$ unit squares; $24 \div 3 = 8$ squares go to each child.

2. One plan makes 3 strips, each 2 columns wide. Each is $\frac{1}{3}$ of the garden.



Problem 2

1. The new patch needs 4 squares to match each old patch. Using 4 of the 5 leaves $5 - 4 = 1$.

2. The four patches together have $4 \times 4 = 16$ squares. Each is 4 of 16, or $\frac{1}{4}$ of the garden.

Problem 3

1. The rectangle has $6 \times 2 = 12$ square units.

2. Join opposite corners. The diagonal makes two matching triangles, so each is $12 \div 2 = 6$ square units, or $\frac{1}{2}$ of the whole.



Problem 4

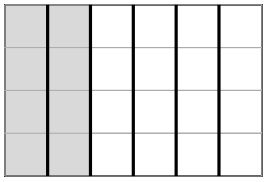
1. The board holds $3 \times 5 = 15$ tiles. Four groups of 3 need 12 tiles, while four groups of 4 need 16.

2. Add one: $15 + 1 = 16$. Then $16 \div 4 = 4$ tiles each, or $\frac{1}{4}$ of the new total.

Problem 5

1. One of the 6 equal beds is $\frac{1}{6}$. Two beds give $\frac{2}{6}$.

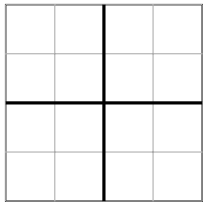
2. Every two-bed group covers the same area. There are three such groups, so the two shaded beds also cover $\frac{1}{3}$.



Problem 6

1. The whole area is $4 \times 4 = 16$ squares. Each first half has $16 \div 2 = 8$ squares.

2. Two halves split into $2 \times 2 = 4$ final equal parts, each $8 \div 2 = 4$ squares, or $\frac{1}{4}$ of the whole. Use the vertical divider first, then the horizontal divider.



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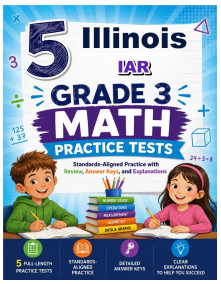

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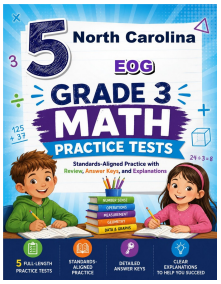

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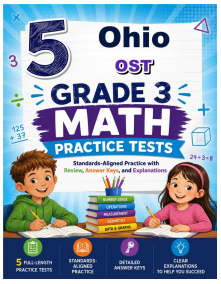

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