Unknown Number in Equations

Apply the skill to decisions and designs

Name _____ **Date** _____ **Score** _____ / 8

QUICK REVIEW

Decide what the unknown counts before writing an equation. If 3 equal bags hold 21 beads and the box means beads per bag, write $3 \times \square = 21$; the missing value is 7 because $3 \times 7 = 21$. A box for the total would go in $3 \times 7 = \square$ instead. In linked equations, the same shape keeps the same value. Check every stated limit, not only the equation.

Worked example

Five equal trays hold 40 crayons. Let $\square$ mean crayons per tray. Build a multiplication equation from the story and find the box.

1. The five trays are equal groups, so $5 \times \square = 40$ represents their total.

2. The fact $5 \times 8 = 40$ gives 8 per tray. Check $40 \div 5 = 8$.

Answer: $5 \times \square = 40$; 8 crayons per tray.

Practice Problems

Show your thinking.

1. Thirty-six beads fill 6 equal bags. Let $\square$ be beads per bag. Write a multiplication equation with the box, then find the missing amount with its unit.

2. Each section of the bar is one pack. Let $\square$ be all the cards. Write a multiplication equation AND a division equation using that same box, then find its value.

Total: $\square$ cards

8	8	8	8

3. Create one multiplication equation and one division equation whose box equals 5. The box must be the first factor in multiplication and the divisor in division. Do not use 0 or 1.

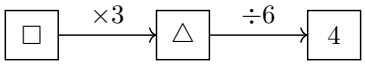
4. Pack exactly 24 seeds into equal bags. Use fewer than 5 bags and at most 6 seeds per bag. Find both counts and write an equation with $\square$ for bags and $\triangle$ for seeds per bag.

5. Twenty-eight books fill 7 equal boxes. Uma writes $\square \div 7 = 28$ for books per box. Explain the wrong unknown position, then write and solve the right equation.

6. An empty basket is shared equally among 2 children, then another empty basket among 5 children. Find one box value that makes BOTH $0 \div 2 = \square$ and $0 \div 5 = \square$ true. Check by multiplication.

7. The same number fills both boxes in $\square \div 1 = \square$. Jun says it must be 1. Give two OTHER whole numbers that work and check each.

8. The machines multiply by 3, then divide by 6, ending at 4. Write equations for the two missing numbers and work BACKWARD to find them.



Answer Key

1. $6 \times \square = 36$; $\square = 6$ beads per bag.
2. $4 \times 8 = \square$ and $\square \div 4 = 8$; $\square = 32$ cards.
3. One possible pair: $\square \times 3 = 15$ and $20 \div \square = 4$.
4. 4 bags of 6 seeds; $\square \times \triangle = 24$, with $\square = 4$ and $\triangle = 6$.
5. $28 \div 7 = \square$; $\square = 4$ books per box.
6. $\square = 0$ objects per child in both cases.
7. For example 4 and 9; the box is not forced to be 1.
8. $\triangle = 24$ and $\square = 8$. Equations: $\triangle \div 6 = 4$ and $\square \times 3 = 24$.

Step-by-Step Solutions

Follow each calculation, then check your own work.

Problem 1

1. There are 6 bags, each holding the unknown amount. Their total gives $6 \times \square = 36$.

2. Six groups of 6 make 36: $6 \times 6 = 36$. Check $36 \div 6 = 6$ beads per bag.

Problem 2

1. The bar shows 4 packs of 8, so $4 \times 8 = 32$ cards. This makes the equation $4 \times 8 = \square$.

2. Sharing the total among the four packs gives $\square \div 4 = 8$. Substitute 32: $32 \div 4 = 8$, so both equations describe the bar.

Problem 3

1. Choose the other factor 3. Since $5 \times 3 = 15$, the equation $\square \times 3 = 15$ has box value 5.

2. Choose quotient 4. Since $5 \times 4 = 20$, $20 \div \square = 4$ also needs 5. Neither equation uses 0 or 1.

Problem 4

1. Three bags can hold at most $3 \times 6 = 18$ seeds, too few. Fewer than 5 bags allows at most 4, so 4 bags are needed.

2. Share the seeds: $24 \div 4 = 6$ per bag, meeting the limit. Check $4 \times 6 = 24$; both unknowns fit the plan.

Problem 5

1. The known total is 28, and 7 counts boxes. The amount in each box must be the quotient: $28 \div 7 = 4$.

2. The check $7 \times 4 = 28$ recovers all books. Putting the box before $\div 7$ would instead make it an unknown total, not books per box.

Problem 6

1. Two children can each get 0 objects: $2 \times 0 = 0$, so $0 \div 2 = 0$.

2. Five children can also each get 0: $5 \times 0 = 0$, so $0 \div 5 = 0$. Both divisors are positive, and changing the child count does not create any objects.

Problem 7

1. Use 4 in both positions: $4 \div 1 = 4$, which is true.

2. Use 9 in both: $9 \div 1 = 9$, also true. Dividing by 1 leaves the number unchanged, so these are two counterexamples to the claim.

Problem 8

1. Undo the last machine first: the middle number satisfies $\triangle \div 6 = 4$, so $\triangle = 6 \times 4 = 24$.

2. Now $\square \times 3 = 24$, giving $\square = 8$ because $8 \times 3 = 24$. Forward check: $8 \times 3 = 24$ and $24 \div 6 = 4$.

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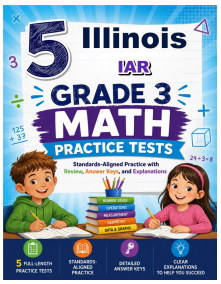

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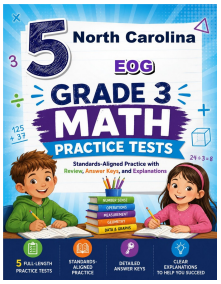

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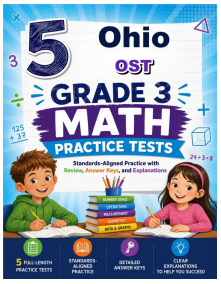

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