

Answer Key: Multiplication and Fair Shares

Grade: 3 **Subject:** Mathematics **For teacher use only** Math

How to use this key

Answers are grouped by section and question number, with the full steps. Accept any correct method that reaches the right answer — drawing dots, skip-counting, repeated addition, or a known fact are all fine at Grade 3. A basic calculator is allowed, so grade the **reasoning and the drawing/steps**, not just the final number. Watch-for notes flag common misconceptions. Estimated grading time: ~3–5 min per packet.

Start Warm-Up ~1 min

1 Skip-count by 5: 5, 10, 15, ____, ____.

20 and 25. Each number is 5 more than the one before ($15 + 5 = 20$, $20 + 5 = 25$). *Watch-for:* a student who writes 16, 17 is counting by 1, not by 5.

2 How many in all — 3 groups of 4 dots (Figure 1).

12 dots. 3 groups of $4 = 4 + 4 + 4 = 12$, or $3 \times 4 = 12$. Accept counting all the dots one by one. *Alternate:* a student may write $4 \times 3 = 12$; either order is fine here.

Build Study the Math ~1 min

3 Find 5×2 (5 groups of 2).

10. 5 groups of $2 = 2 + 2 + 2 + 2 + 2 = 10$, so $5 \times 2 = 10$. Full credit for a drawing of 5 groups with 2 dots each and the answer 10. *Alternate:* skip-counting by 2 (2, 4, 6, 8, 10) or writing $2 \times 5 = 10$ is fine.

Apply Use What You Know ~2–3 min

4 Equal groups: 5 bags, 4 apples each.

20 apples. 5 bags $\times$ 4 apples = $5 \times 4 = 20$ (or $4 + 4 + 4 + 4 + 4 = 20$). Accept $4 \times 5 = 20$. *Watch-for:* a student who writes $5 + 4 = 9$ has **added instead of multiplied**.

5 Array match (Figure 3): 2 rows of 6.

2 rows; 6 in each row; $2 \times 6 = 12$ (accept $6 \times 2 = 12$). The array is 2 rows with 6 dots in each row, so there are 12 dots in all. *Watch-for:* a student who swaps rows and columns (says 6 rows of 2) still reaches 12; gently correct the row/column labels but the product is right.

6 Fair share: 15 crayons shared among 3 friends.

5 crayons each. $15 \div 3 = 5$. Sharing 15 into 3 equal groups puts 5 in each group. Check with multiplication: $3 \times 5 = 15$. Accept a drawing of 3 groups with 5 crayons dealt into each. *Watch-for:* a student who writes $15 \div 3 = 12$ (subtracted) or divides into the wrong number of groups.

7 Find and fix the mistake (Figure 4): 4, 3, 4 dots.

The mistake: the groups are **not equal** — Group 1 has 4, Group 2 has **only 3**, and Group 3 has 4. You can **only** multiply (3×4) when every group has the **same number**, so $3 \times 4 = 12$ does not fit this picture.

Correct count: add the groups: $4 + 3 + 4 = 11$ dots in all.

Full credit requires (1) naming that the groups are not equal (Group 2 has 3, not 4) and (2) the correct total, **11**.

Alternate: a student may fix it by saying "if it were really equal groups, add one more to Group 2 to make $3 \times 4 = 12$ " — accept this if they clearly explain the groups were unequal.

Explain Tell How You Know (Q8) ~1–2 min

8 Explain the fair share of 15 crayons among 3 friends.

Model answer. Answer: each friend gets 5 crayons. Picture or numbers: 3 groups with 5 in each group, or $15 \div 3 = 5$, or the check $3 \times 5 = 15$. Why it is fair: every group has the **same number** (5), so no friend gets more or fewer than another — that is what "fair share" means. Full credit requires the correct answer (5) and a reason that the groups are equal / everyone gets the same amount.

Explanation scoring rubric (3 points)

Score	Answer	Picture or numbers	Why (reasoning)
3	Correct: 5 each.	Shows 3 equal groups of 5, or $15 \div 3 = 5$ (or $3 \times 5 = 15$).	Clearly says it is fair because every group has the same number.
2	Correct: 5 each.	Some picture or numbers shown, or a small slip.	Reasoning present but incomplete (e.g., "everyone gets 5" without saying why that is fair).
1	Answer attempted, may be wrong.	Little or no picture/numbers.	Weak or missing reasoning.
0	No/incorrect answer.	No work.	No reasoning.

Close ACE ~1 min

ACE Articulate / Connect / Extend.

Articulate: accept any plain-language version of "equal groups means every group has the same number in it."

Connect: items where students multiplied include Q3, Q4, and Q5 (and the check in Q6/Q8). Any correctly named item earns credit.

Extend: any correct equal-groups multiplication fact not in the packet — e.g., $2 \times 5 = 10$, $3 \times 3 = 9$, $4 \times 2 = 8$, $2 \times 6 = 12$. Check the fact is true and uses equal groups.

Challenge Early Finisher (optional)

EF Draw 6×2 , then the same as a 2×6 array.

$6 \times 2 = 12$. Six groups of 2 dots = $2 + 2 + 2 + 2 + 2 + 2 = 12$. As an array, the same 12 dots make **2 rows of 6**, so $2 \times 6 = 12$. Full credit for a labeled drawing of 6 groups of 2 and an array showing 12, with both sentences.

Teaching point: 6×2 and 2×6 give the same total — the array can be turned to show either.

Watch Common misconceptions

- **Adding instead of multiplying.** In Q4, a student may write $5 + 4 = 9$ instead of $5 \times 4 = 20$. Remind them "5 bags of 4" means 4 counted 5 times, not $5 + 4$. Drawing the 5 bags with 4 apples each makes it clear.
- **Unequal groups (the Q7 error).** Students see three ovals and multiply 3×4 without checking that each group truly holds 4. You can only multiply when the groups are **equal**; when they are not (4, 3, 4), you must add: $4 + 3 + 4 = 11$.
- **Mixing up $\times$ and $\div$.** In the fair-share problem (Q6), some students multiply 15×3 instead of dividing $15 \div 3$. Anchor the words: "share equally" and "each gets" signal division. Check by multiplying back: $3 \times 5 = 15$.
- **Rows vs. columns.** In Q5 a student may call it "6 rows of 2." The product (12) is still correct, but coach the labels: rows go across, and here there are 2 rows with 6 in each.
- **Skip-counting by 1.** In Q1, watch for 16, 17 instead of 20, 25 — the student counted by 1, not by 5.

Teacher follow-up based on likely errors

If many students miss Q7, do a quick picture of three equal groups next to three unequal groups so they see multiplication needs equal groups. If Q4 shows $5 + 4 = 9$, draw the bags of apples and count. If Q6 shows multiplying instead of dividing, deal out counters (or drawn dots) into 3 groups to model fair sharing, then check with $3 \times 5 = 15$. The Q8 explanations show who understands *why* a share is fair — a good warm-up for next class. The separate student packet has all the models printed; this key is for the teacher only.

G03_MATH_MultiplicationShares_01 — Multiplication and Fair Shares Teacher Answer Key