

Substitute Guide: Multiplication and Fair Shares

Grade: 3 **Subject:** Mathematics **Time:** ~45 min core + ~15 min extension Math

Learning goal (plain language)

Students practice **multiplication as equal groups and arrays** and **division as fair sharing**, with small numbers within 100. **You do not need a math background to run this.** Every method and a picture example are printed in the student packet. Students **show their work** (they may draw dots or arrays); **you do not need to teach the method** — the packet does the teaching. Your job is to hand it out, read the start script, keep the room on task, and collect the packets. This whole guide takes about 5 minutes to read.

Standards alignment

Framework: 19 TAC §111.5 (Grade 3 Mathematics). Number and operations — multiplication and division.

- **Multiplication:** represent multiplication as equal groups and as arrays (rows $\times$ columns).
- **Division:** represent division as sharing a total into equal groups (fair shares).
- **Connections:** multiplication and division are related ($3 \times 4 = 12$, so $12 \div 3 = 4$).

Provisional — pending educator verification against the current official TAC source.

(Standards are paraphrased here, not quoted. Please confirm codes and wording against your official source.)

Setup Before class (5 min)

- Count and hand out one **student packet** per student.
- Confirm each student has a **pencil**. A **calculator is not required**; a basic calculator is allowed for any student who has one.
- Write the date on the board and remind students to fill in the name line.
- Keep the **answer key** with you — it is a separate file and is **not** in the student packet.

Materials What's needed

- Printed student packet (about 4 pages) per student.
- Pencil per student; a basic four-function calculator is optional (not required).
- This guide and the separate answer key (teacher only).
- No technology, no internet, no special supplies, no physical manipulatives — students draw to model.

Timing Suggested pacing (~45–60 min)

Segment	Time	What students do
Start — Warm-up	5 min	Q1–Q2 (skip-count by 5; count 3 groups of 4)
Build — Study the math	5–10 min	Read reference box, worked example, array picture; Q3

Segment	Time	What students do
Apply — Use what you know	20–25 min	Q4–Q7 (equal-groups story, array match, fair share, find the mistake)
Explain — Tell how you know (Answer/Picture/Why)	5–10 min	Q8 short explanation
Close — ACE	5 min	Articulate / Connect / Extend
Continue — early finishers	optional ~15 min	Draw 6×2 as groups and as an array

Script Read aloud to start

"Today's work is a paper math packet called *Multiplication and Fair Shares*. You will work by yourself with a pencil. You do not need a calculator, but you may use a basic one if you have it. The most important rule: **show your work** — you may draw dots or groups to help you. Everything you need is printed in the packet, including a picture that shows how it works. Start with the warm-up, then read the Build part before the Apply questions. If a problem is tricky, skip it and come back. Put your name and the date at the top now. You have about 45 minutes. Raise your hand if you need help **reading** a question — I can read any part out loud."

Support When students ask for help

- **Students show their work; you do not need to teach the method.** Point them back to the printed **reference box**, the **worked example**, and the **array picture (Figure 2)** — the method is right there.
- **You may read any part aloud** to a student or the whole class.
- If a student is stuck, prompt with "Can you draw the groups?" or "How many are in each group?" rather than giving the answer.
- For a fair-share problem, suggest they draw the groups and "deal out" one at a time, like dealing cards.
- It is fine if a student cannot finish the optional early-finisher challenge.

Access Accommodations & language support

- **Read-aloud** of any question is allowed for all students — this packet is written to be read aloud.
- Point students to the **worked example**, the **array picture**, and the **sentence starters** for Q8 and ACE.
- A **calculator is allowed** (not required) for any student who wants one, so the focus stays on the groups-and-sharing idea, not the arithmetic.
- Extended time is fine; the core can stop after Q8 if time runs short.
- Students may answer with **drawings and numbers** instead of full sentences if writing is a barrier, as long as the thinking is clear.
- The packet is grayscale-safe — pictures are plain black-and-white dots and arrays, so they print and read clearly in black and white.

Tools Allowed & not allowed

Allowed: pencil, the printed packet, drawing dots/arrays, a basic (four-function) calculator, quiet self-read-aloud.
Not needed / not allowed: phones, internet, graphing/AI calculators, or getting answers from another student.

Collect at the end: Collect every packet, whether finished or not, with names on them. Stack them for the teacher. Note on a sticky how far most students got and any questions that caused confusion.
 Answer key: The **answer key is a separate file** (answerkey.html) and is for the teacher only. Please do not hand it to students.

Teacher follow-up (for the returning teacher)

The highest-value items to review next class are the **find-the-mistake item (Q7)** and the **fair-share explanation (Q8)**, which reveal the "unequal groups" and " $\times/\div$ mix-up" misconceptions. Watch for **adding instead of multiplying** in Q4 and **skip-counting by 1** in Q1. The separate answer key lists worked steps, alternate strategies, common misconceptions, and a 3-point rubric for Q8.

G03_MATH_MultiplicationShares_01 — Multiplication and Fair Shares Substitute Guide

Multiplication and Fair Shares

Grade: 3 **Subject:** Mathematics **Time:** ~45 min core + ~15 min extension **Work mode:** Independent · pencil + packet Math

Start Here

This is a **paper math packet** about **equal groups** and **fair shares**. Work by yourself with a pencil. **You do not need a calculator**, but a basic calculator is allowed if you have one. **Show your work** — you may draw dots, circles, or arrays to help you. Everything you need is printed right here, including a picture that shows how it works. If a problem is hard, skip it and come back. Circle your final answer.

Start Warm-Up 5 min

Get your brain ready. These are easy on purpose.

1**Skip-count by 5.** Fill in the two missing numbers on the line.

5, 10, 15, _____, _____

2**How many in all?** Here are 3 **groups**. Each group has 4 **dots**. Count all the dots and write how many there are in all.

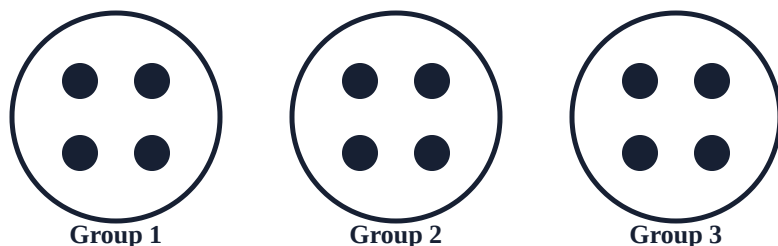


Figure 1. Three groups of four dots.

Build Study the Math 5–10 min

What you need to know

Equal groups. When every group has the **same number** in it, you can multiply. "4 groups of 3" means 4 groups that each hold 3. You can add ($3 + 3 + 3 + 3$) or you can **multiply** (4×3). Both give 12.

What $\times$ means. In $4 \times 3 = 12$, the 4 is how many groups, and the 3 is how many in each group. The answer, 12, is how many **in all**. Careful: the groups must be **equal** to multiply.

Arrays. An **array** lines things up in **rows** and **columns** (a rectangle of dots). You multiply **rows $\times$ columns**. A 3-by-4 array has 3 rows and 4 in each row, so $3 \times 4 = 12$.

What $\div$ means (fair shares). **Division** shares things into equal groups. "Share 12 into 3 equal groups" is $12 \div 3 = 4$ — each group gets 4. Division and multiplication are opposites: $3 \times 4 = 12$, so $12 \div 3 = 4$.

Watch out: multiplying is **not** the same as adding one time. And groups must be **equal** — if they are not, you cannot just multiply.

Worked Example — equal groups and an array

Find 4×3 (4 groups of 3).

Step 1 — draw the groups: Make 4 groups. Put 3 dots in each group.

Step 2 — count in all: $3 + 3 + 3 + 3 = 12$. So $4 \times 3 = 12$.

Step 3 — see it as an array: The same 12 dots can line up in **3 rows of 4**. That is $3 \times 4 = 12$. The picture below shows the array.

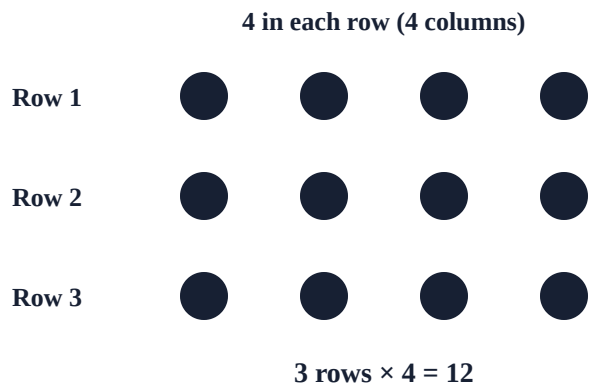


Figure 2. A 3×4 array: 3 rows with 4 dots in each row make 12 in all. Drawn in black so it reads clearly in grayscale.

3Using the worked example as your guide, find 5×2 (5 groups of 2). You may **draw the 5 groups** and then count. Show how you found the answer.

Apply Use What You Know 20–25 min

Show your work in every item. You may draw dots or an array to help.

4**Equal groups story.** There are **5 bags**. Each bag has **4 apples**. How many apples are there **in all**? Write a multiplication sentence and find the answer.

5**Array match.** Look at the array below. Write the number of **rows**, the number in **each row**, and the multiplication sentence with the answer.

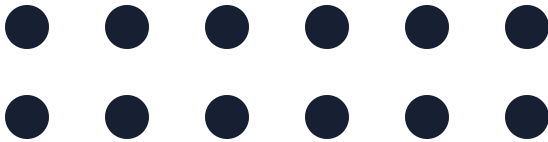


Figure 3. An array of dots.

Rows: _____ In each row: _____ Multiplication sentence: _____ $\times$ _____ = _____

6**Fair-share story (division).** Mia has **15 crayons**. She shares them **equally** among **3 friends**. How many crayons does **each friend** get? Write a division sentence and find the answer. You may draw 3 groups and share the crayons one at a time.

7**Find and fix the mistake.** A student counted the picture below and said the groups show $3 \times 4 = 12$. But look carefully — the groups are **not equal**. Tell what is wrong, and write the correct number of dots **in all**.

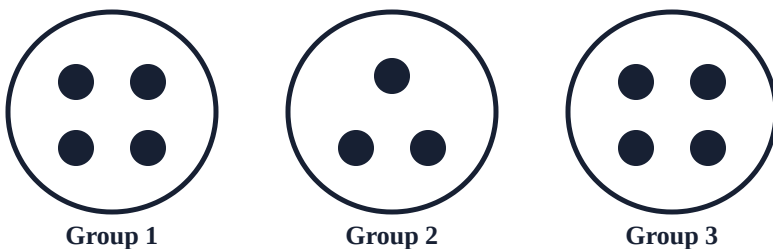


Figure 4. Three groups — look closely at how many are in each one.

What is wrong, and how many dots are there in all?

Explain Tell How You Know 5–10 min

Question 8. In problem 6, Mia shared 15 crayons among 3 friends. Explain how you know each friend gets a fair share. Use the boxes below: write your **Answer**, a **Picture or numbers** that shows it, and **Why** it is fair.

Sentence starters you may use: "Each friend gets ____ crayons." · "I drew 3 groups and put ____ in each." · "It is fair because every group has the ____ number." · "I know because ____ $\times$ 3 = 15."

Answer (how many each friend gets)

Picture or numbers

Why it is a fair share

Close ACE Wrap-Up 5 min

Articulate

In your own words, tell what **equal groups** means.

Connect

Point to one item in this packet where you **multiplied**. Write its number.

Extend

Write your own multiplication fact using equal groups that was **not** in this packet (for example, 2 groups of 5).

Continue Early Finisher optional · ~15 min

If you finish early (no new materials needed):

Draw the groups. On the back of this page, show 6×2 (6 groups of 2). Draw 6 groups, put 2 dots in each, and write how many there are **in all**. Then draw the same dots as an **array** (2 rows of 6) and write that multiplication sentence too.

Turn in: Hand in this whole packet with your name, class, and date filled in. Make sure questions 1–8 and the ACE box are answered **with your work shown**. The early-finisher challenge is optional, but turn it in too if you did it.

G03_MATH_MultiplicationShares_01 — Multiplication and Fair Shares Student Packet



TEACHER ANSWER KEY FOLLOWS

Do not copy the pages after this divider for students.

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