Bakery Boxes

Teacher Guide · Solutions · Rubric

Grade 3 · All levels

Overview

Students run a bakery. They pack muffins in trays and boxes, turn arrays (commutative), regroup trays and boxes (associative), break hard facts into easier ones (distributive) and explain their strategies.

Time: 2 class periods · **Product:** Bakery Order Sheet
Standards: 3.OA.B.5, 3.OA.C.7
Prerequisite skills: Arrays and equal groups (Unit 1); Facts for 2, 5 and 10

Learning targets

- I can use the commutative and associative properties to multiply.
- I can break a factor into parts, multiply each part and add.
- I can find any fact to 10 × 10 with a strategy.

Timing and materials

- Day 1 (45 min): trays as arrays; turn and split arrays (Parts 1–2).
- Day 2 (45 min): boxes of trays (Part 3) and the order sheet with explained strategies.

Materials: Grid paper or square tiles; Colored pencils; Order sheet (printable support page). No accounts, paid products or student personal information are needed.

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The three versions

- Remedial: hints for a first step, partly filled tables, sentence frames and fewer open choices; the same learning targets.
- Standard: the full task set at grade level; students choose their strategies and models.
- Advanced: open design constraints, missing information, error analysis and a written justification; no hints.

All versions use the same context and learning targets, so groups can share and compare work.

Implementation notes

- Split arrays with a colored line so the two parts are visible.
- Ask students to name the known fact they start from.
- Advanced students compare two strategies for the same order and judge which is easier and why.
- Before Part 1, read the challenge aloud and ask students to restate the goal.
- Close with a gallery walk: each group explains one strategy.

Rubric

Learning target	4 Exceeds	3 Meets	2 Approaching	1 Beginning
I can use the commutative and associative properties to multiply.	Correct and complete; explains how	Mostly correct	Partly correct	Not yet
I can break a factor into parts, multiply each part and add.	Correct and complete; explains how	Mostly correct	Partly correct	Not yet
I can find any fact to 10 × 10 with a strategy.	Correct and complete; explains how	Mostly correct	Partly correct	Not yet
I can explain my thinking with pictures, numbers and words.	Clear for every part	Clear for most parts	Some explanation	Little explanation
My bakery order sheet is complete and matches my math.	Complete, neat, accurate	Complete	Partly complete	Not complete

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Solutions · Remedial KEY

Part 1: Muffin Trays

One tray holds 4 rows of 6 muffins.

1. How many muffins are on one tray?
   24 muffins
2. Turn the tray. Write the other multiplication equation.
   6 × 4 = 24

Part 2: Break It Apart

Split the tray after the 5th column to make 4 × 6 easier.

3. Write the two smaller facts.
   4 × 5 = 20 and 4 × 1 = 4
4. Add the parts. What is the total?
   24

Part 3: Boxes of Trays

A box holds 3 trays, and each tray has 5 cupcakes. An order is for 2 boxes.

5. How many cupcakes are in one box?
   15 cupcakes
6. How many cupcakes are in the whole order?
   30 cupcakes
7. Which grouping did you use, and why was it easy?
   Answers vary, e.g. 3 × 5 = 15 first, then × 2.

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Part 4: Order Sheet

Fill in the order sheet for 3 orders. Show one strategy for each product.

8. Orders and strategies.

Answers vary; check each product and strategy.

Extension

A pan has 6 rows of 9 rolls. Show two different ways to break apart 6 × 9.

Examples: (6 × 5) + (6 × 4) = 54; (5 × 9) + (1 × 9) = 54.

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Solutions · Standard KEY

Part 1: Muffin Trays

One tray holds 7 rows of 6 muffins.

1. How many muffins are on one tray?
   42 muffins
2. Turn the tray. Write the other multiplication equation.
   6 × 7 = 42

Part 2: Break It Apart

Split the tray after the 5th column to make 7 × 6 easier.

3. Write the two smaller facts.
   7 × 5 = 35 and 7 × 1 = 7
4. Add the parts. What is the total?
   42

Part 3: Boxes of Trays

A box holds 2 trays, and each tray has 5 cupcakes. An order is for 3 boxes.

5. How many cupcakes are in one box?
   10 cupcakes
6. How many cupcakes are in the whole order?
   30 cupcakes
7. Which grouping did you use, and why was it easy?
   Answers vary, e.g. 2 × 5 = 10 first, then × 3.

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Part 4: Order Sheet

Fill in the order sheet for 3 orders. Show one strategy for each product.

8. Orders and strategies.

Answers vary; check each product and strategy.

Extension

A pan has 6 rows of 9 rolls. Show two different ways to break apart 6 × 9.

Examples: (6 × 5) + (6 × 4) = 54; (5 × 9) + (1 × 9) = 54.

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Solutions · Advanced KEY

Part 1: Muffin Trays

One tray holds 8 rows of 7 muffins.

1. How many muffins are on one tray?
   56 muffins
2. Turn the tray. Write the other multiplication equation.
   7 × 8 = 56

Part 2: Break It Apart

Split the tray after the 5th column to make 8 × 7 easier.

3. Write the two smaller facts.
   8 × 5 = 40 and 8 × 2 = 16
4. Add the parts. What is the total?
   56

Part 3: Boxes of Trays

A box holds 3 trays, and each tray has 5 cupcakes. An order is for 4 boxes.

5. How many cupcakes are in one box?
   15 cupcakes
6. How many cupcakes are in the whole order?
   60 cupcakes
7. Which grouping did you use, and why was it easy?
   Answers vary, e.g. 3 × 5 = 15 first, then × 4.

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Part 4: Compare Strategies

Two bakers found 9 × 8 in different ways.

8. Ana: (10 × 8) − 8. Ben: (5 × 8) + (4 × 8). Find each result.

Both get 72: 80 − 8 = 72; 40 + 32 = 72.

9. Which strategy uses fewer steps? Explain.

Ana's: one known fact and one subtraction.

10. Cora wrote 9 × 8 = (9 × 5) + 3. What is wrong?

She did not multiply the 3 by 9; it should be (9 × 5) + (9 × 3) = 72.

Extension

A pan has 6 rows of 9 rolls. Show two different ways to break apart 6 × 9.

Examples: (6 × 5) + (6 × 4) = 54; (5 × 9) + (1 × 9) = 54.