School Store Shelves

Teacher Guide · Solutions · Rubric

Grade 3 · All levels

Overview

Students stock a school store. They model packs of supplies as equal groups, arrange items in arrays, write multiplication equations and solve store word problems.

Time: 2 class periods · **Product:** Store Shelf Plan
Standards: 3.OA.A.1, 3.OA.A.3, 3.OA.C.7
Prerequisite skills: Count objects and skip count by 2s, 5s and 10s (Grade 2); Add equal addends (repeated addition)

Learning targets

- I can write a multiplication expression for equal groups and tell what each factor means.
- I can describe an array and find the total by multiplying.
- I can solve equal-group and array word problems with a drawing and an equation.

Timing and materials

- Day 1 (45 min): read the challenge together; model packs with counters; Parts 1–2.
- Day 2 (45 min): arrays and store problems (Parts 3–4); build and share the shelf plan.

Materials: Pencils, crayons and markers; Counters or cubes (about 40 per pair); Grid paper (printable support page); Chart paper for the shelf plan. 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

- Let students build each pack with counters before they write the equation.
- Ask “How many groups? How many in each group?” for every item.
- Advanced students design their own shelf with a fixed number of items; check every array they claim.
- 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 write a multiplication expression for equal groups and tell what each factor means.	Correct and complete; explains how	Mostly correct	Partly correct	Not yet
I can describe an array and find the total by multiplying.	Correct and complete; explains how	Mostly correct	Partly correct	Not yet
I can solve equal-group and array word problems with a drawing and an equation.	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 store shelf plan is complete and matches my math.	Complete, neat, accurate	Complete	Partly complete	Not complete

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Solutions · Remedial KEY

Part 1: Pencil Packs

The store gets 4 packs of pencils. Each pack has 5 pencils.

Packs (groups)	Pencils in each pack	Total
4	5	

1. Draw 4 equal groups. How many pencils are in each group?
5

2. Write a multiplication expression for the pencils.
4 × 5

3. How many pencils are there in all?
20 pencils

Part 2: Eraser Display

Erasers are set out in an array with 3 rows and 5 erasers in each row.

4. How many erasers are in each row?
5

5. Write an equation for the array.
3 × 5 = 15

6. The display turns so it has 5 rows. How many in each row now?
3

School Store Shelves

Teacher Guide · Solutions · Rubric

Grade 3 · All levels

Part 3: Store Problems

Use a drawing or an equation for each problem.

7. Markers come in boxes of 10. The store orders 6 boxes. How many markers?

60 markers

8. Each notebook costs 5 dollars. How much do 7 notebooks cost?

35 dollars

Part 4: Shelf Plan

Make a shelf plan with three items. Show each item as equal groups or an array with an equation.

9. Item 1, item 2 and item 3 with equations.

Answers vary; each equation must match its picture.

Extension

The store sells stickers in sheets of 4 rows of 5. A class buys 3 sheets. How many stickers?

60 stickers (3 × 20)

School Store Shelves

Teacher Guide · Solutions · Rubric

Grade 3 · All levels

Solutions · Standard KEY

Part 1: Pencil Packs

The store gets 6 packs of pencils. Each pack has 8 pencils.

Packs (groups)	Pencils in each pack	Total
6	8	

1. Draw 6 equal groups. How many pencils are in each group?
   8
2. Write a multiplication expression for the pencils.
   6 × 8
3. How many pencils are there in all?
   48 pencils

Part 2: Eraser Display

Erasers are set out in an array with 4 rows and 7 erasers in each row.

4. How many erasers are in each row?
   7
5. Write an equation for the array.
   4 × 7 = 28
6. The display turns so it has 7 rows. How many in each row now?
   4

School Store Shelves

Teacher Guide · Solutions · Rubric

Grade 3 · All levels

Part 3: Store Problems

Use a drawing or an equation for each problem.

7. Markers come in boxes of 10. The store orders 6 boxes. How many markers?

60 markers

8. Each notebook costs 5 dollars. How much do 7 notebooks cost?

35 dollars

Part 4: Shelf Plan

Make a shelf plan with three items. Show each item as equal groups or an array with an equation.

9. Item 1, item 2 and item 3 with equations.

Answers vary; each equation must match its picture.

Extension

The store sells stickers in sheets of 4 rows of 5. A class buys 3 sheets. How many stickers?

60 stickers (3 × 20)

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Grade 3 · All levels

Solutions · Advanced KEY

Part 1: Pencil Packs

The store gets 7 packs of pencils. Each pack has 9 pencils.

Packs (groups)	Pencils in each pack	Total
7	9	

1. Draw 7 equal groups. How many pencils are in each group?
   9
2. Write a multiplication expression for the pencils.
   7 × 9
3. How many pencils are there in all?
   63 pencils

Part 2: Eraser Display

Erasers are set out in an array with 6 rows and 8 erasers in each row.

4. How many erasers are in each row?
   8
5. Write an equation for the array.
   6 × 8 = 48
6. The display turns so it has 8 rows. How many in each row now?
   6

School Store Shelves

Teacher Guide · Solutions · Rubric

Grade 3 · All levels

Part 3: Store Problems

Use a drawing or an equation for each problem.

7. Markers come in boxes of 10. The store orders 6 boxes. How many markers?

60 markers

8. Notebooks cost 5 dollars each. What is the cost of 7 notebooks and 3 folders that cost 2 dollars each?

41 dollars

Part 4: Design Challenge

The store has 36 glue sticks. Design shelf arrays that use ALL 36 with no extras.

9. List every array (rows × number in each row) that uses exactly 36 glue sticks.

1 × 36, 2 × 18, 3 × 12, 4 × 9, 6 × 6, 9 × 4, 12 × 3, 18 × 2, 36 × 1

10. A shelf holds at most 6 rows and 9 in each row. Which arrays fit?

4 × 9 and 6 × 6

11. Kai says 5 × 7 works because 5 + 7 is close to 36. Explain the mistake.

5 × 7 = 35, not 36, and adding the factors does not give the total.

Extension

The store sells stickers in sheets of 4 rows of 5. A class buys 3 sheets. How many stickers?

60 stickers (3 × 20)