

Miniature City Builder

Teacher Guide & Answer Keys

Grade 5 · All levels

Overview

Students design a miniature city. They build rectangular-prism buildings from unit cubes, find volumes with V = l × w × h and V = B × h, find volumes of L-shaped (composite) buildings, and plan how many boxes fit in a delivery truck.

Time: 3 class periods · **Product:** City Blueprint · **Standards:** 5.MD.C.3, 5.MD.C.4, 5.MD.C.5

Suggested pacing

- Day 1: Introduce the challenge, read the scenario together, and work Parts 1–2 in pairs.
- Day 2: Finish the remaining parts and create the final product.
- Day 3: Share products in a gallery walk and reflect.

Levels

- **Remedial:** smaller numbers, fewer steps, more structure.
- **Standard:** grade-level numbers and the full set of tasks.
- **Advanced:** harder numbers, extra reasoning and multi-step questions.

All three levels practice the same learning goals, so the class can share and compare work.

Rubric

Category	4 Excellent	3 Good	2 Developing	1 Beginning
Math accuracy	All answers correct	Most answers correct	Some answers correct	Few answers correct
Shows work	Clear work for every step	Work for most steps	Some work shown	Little work shown
Explains thinking	Clear, complete explanations	Mostly clear explanations	Some explanation	Little explanation
Final product	Complete, neat and creative	Complete and neat	Partly complete	Not complete

Miniature City Builder

Teacher Guide & Answer Keys

Grade 5 · All levels

Answer key · Remedial KEY

Part 1: Buildings

1. House: 3 × 2 × 2

12 cubic units

2. Shop: 4 × 3 × 2

24 cubic units

3. Library: 5 × 3 × 3

45 cubic units

Part 2: Tower

4. Use V = B × h to find its volume.

48 cubic units

Part 3: L-Shaped Mall

5. Find the volume of each part.

24 and 20 cubic units

6. Find the total volume.

44 cubic units

Part 4: Delivery Truck

7. How many boxes fit?

12 boxes

Part 5: Your Blueprint

8. Give its dimensions and volume.

Answers vary.

Extension

Examples: 6 × 4 × 3 and 9 × 4 × 2

Miniature City Builder

Teacher Guide & Answer Keys

Grade 5 · All levels

Answer key · Standard KEY

Part 1: Buildings

1. House: 4 × 3 × 3
36 cubic units

2. Shop: 6 × 4 × 3
72 cubic units

3. Library: 7 × 5 × 4
140 cubic units

Part 2: Tower

4. Use V = B × h to find its volume.
144 cubic units

Part 3: L-Shaped Mall

5. Find the volume of each part.
72 and 72 cubic units

6. Find the total volume.
144 cubic units

Part 4: Delivery Truck

7. How many boxes fit?
30 boxes

Part 5: Your Blueprint

8. Give its dimensions and volume.
Answers vary.

Extension

Examples: 6 × 4 × 3 and 9 × 4 × 2

Miniature City Builder

Teacher Guide & Answer Keys

Grade 5 · All levels

Answer key · Advanced KEY

Part 1: Buildings

1. House: 5 × 4 × 3
60 cubic units

2. Shop: 8 × 5 × 4
160 cubic units

3. Library: 9 × 6 × 5
270 cubic units

Part 2: Tower

4. Use V = B × h to find its volume.
360 cubic units

Part 3: L-Shaped Mall

5. Find the volume of each part.
160 and 160 cubic units

6. Find the total volume.
320 cubic units

Part 4: Delivery Truck

7. How many boxes fit?
48 boxes

Part 5: Your Blueprint

8. Give its dimensions and volume.
Answers vary.

Extension

Examples: 6 × 4 × 3 and 9 × 4 × 2

Miniature City Builder

Teacher Guide & Answer Keys

Grade 5 · All levels

Worked teacher example (Standard, Part 1)

House: 4 × 3 × 3

36 cubic units

Shop: 6 × 4 × 3

72 cubic units

Library: 7 × 5 × 4

140 cubic units

Model the first part aloud: read the situation, name the operation, estimate, solve, and check. Then let partners try Part 2.

Look for

- Students use correct notation and units in every answer.
- Students explain why an answer is reasonable (estimates, benchmarks, pictures).
- Final products show the math clearly, not just the answers.