

Miniature City Builder

5th Grade Math Project · Design & Engineering

Grade 5 · Advanced

Name: _____ Date: _____ Class: _____

The Challenge

The town council wants a model of a new miniature city! You are the architect. Every building is a rectangular prism, and the council needs to know its volume.

You will make: City Blueprint

What you will learn

- Find volume by counting unit cubes
- Use $V = l \times w \times h$ and $V = B \times h$
- Find volumes of composite figures
- Solve real-world volume problems

Materials

- Pencil
- Unit cubes or grid paper
- Boxes or paper for models (optional)

How to do it

1. Part 1: Buildings
2. Part 2: Tower
3. Part 3: L-Shaped Mall
4. Part 4: Delivery Truck
5. Part 5: Your Blueprint
6. Check your work and share your city blueprint.

Part 1: Buildings

Find the volume of each building in cubic units.

Building	l	w	h	Volume
House	5	4	3	
Shop	8	5	4	
Library	9	6	5	

1. House: 5 × 4 × 3

2. Shop: 8 × 5 × 4

3. Library: 9 × 6 × 5

Part 2: Tower

The tower's base has an area of 45 square units and it is 8 units tall.

4. Use V = B × h to find its volume.

Part 3: L-Shaped Mall

The mall is two prisms: 8 × 4 × 5 and 4 × 4 × 10.

5. Find the volume of each part.

6. Find the total volume.

Part 4: Delivery Truck

A truck is 12 × 8 × 6 units. Boxes are 3 × 2 × 2 units, packed the same direction.

7. How many boxes fit?

Part 5: Your Blueprint

Design one more building of your own with a volume between 50 and 100 cubic units.

8. Give its dimensions and volume.

⭐ Extension Challenge

Design two different buildings with exactly the same volume, 72 cubic units. Give the dimensions of each.

How your project will be scored

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