

Facilitation Guide



10-15 Min
Small Group



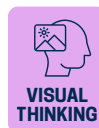
Digital Guide

ARTS EVERY DAY
IN BALTIMORE CITY PUBLIC SCHOOLS

Architect Studio

ROUTINE OVERVIEW

In this small group activity, students become architects designing a block of Baltimore row homes. They will sketch rows of connected row homes and use floors and windows to model the Associative Property of Multiplication. Students explore different ways to group the same total number of windows (or bricks) while discovering that the grouping changes, but the product remains the same.



Maryland Standards

MARYLAND STATE MATH STANDARDS

- **3.NOS.C.4** – Identify and apply the Commutative Property of Multiplication, Associative Property of Multiplication, and Distributive Property of Multiplication as strategies to multiply.

MARYLAND ARTS STANDARDS

- **VA.AS1.I:3–5:1** – Act on creative ideas to develop personally meaningful compositions through observation, imagination, or memory.



*Not in MD? View **National Standards** in the Digital Guide*

Getting Ready ★ **REVEAL MATH: 3rd Grade: 10–3**

ARTS INTEGRATED LEARNING OBJECTIVE(S): SWBAT design a Baltimore row home neighborhood to show how different groupings of the same factors can make the same product. I can use windows, floors, and repeated patterns to model and explain the Associative Property of Multiplication.

MATH DOMAIN:

Operations & Algebraic Thinking	Understand properties of multiplication and use strategies to solve multiplication problems	Apply the Associative Property of Multiplication as a strategy
		Understand that factors can be regrouped without changing the product

WHAT'S BEFORE: Explore multiplication as equal groups, arrays, and repeated addition. Understand factors and products. Use the Commutative property. Use visual models.

WHAT'S NEXT: Apply the Associative property. Use multiplication properties, models, and equations to solve multi-step problems.

MATERIALS:

- [Slides](#)
- [Handouts](#)
- Drawing paper or architecture template
- Pencils and erasers
- Rulers
- Colored pencils, crayons, or markers
- Student recording sheet
- Math vocabulary cards (factor, product, associative property, regroup, equal groups)
- Example images of Baltimore row homes for inspiration (optional)

MATH SKILL: Associative Property, represent multiplication situations using visual models, equations, and reasoning.

ART SKILL: Architectural drawing by using pattern, repetition, and composition.

TEACH

Facilitation Steps

1. Introduce the Challenge

Tell students:

"Today you are going to become architects! Architects design neighborhoods by planning buildings with repeating structures and patterns. Your job is to design a neighborhood of Baltimore row homes that also represents a multiplication equation using the Associative Property."

Show an example of a completed row home neighborhood and discuss the repeating features (homes, floors, windows).

2. Design the Neighborhood

Give each student grid paper.

Prompt students:

"First, decide how many row homes you want in your neighborhood."

Using one color, students draw that number of connected row homes in a straight line.

Remind students:

- All row homes should be the same size.
- Leave enough room to add details.

3. Add the Floors

Ask:

"How many floors will each row home have?"

Using a second color, students outline or label the floors inside each home.

Teacher models:

- 3 row homes
- 4 floors in each home

Record:

3×4

4. Add the Windows

Ask:

"How many windows will each floor have?"

Students choose a symbol (squares, circles, stars, etc.) and draw the same number of windows on every floor.

Teacher models:

- 5 windows per floor

Record the complete equation:

$3 \times 4 \times 5 = 60$

Discuss:

"Each feature of our neighborhood represents one factor in our multiplication equation."



TEACH

Facilitation Steps

5. Reflect and Explain

Students complete a quick reflection on their recording sheet.

Possible prompts:

- What does each factor represent?
- What is the product?
- How does your drawing prove your equation?
- Explain how your neighborhood models multiplication.

Assessment

Look for students who can:

- Correctly identify each factor.
- Connect their drawing to their multiplication equation.
- Explain how the product represents the total number of windows.

Differentiation

Provide students with a completed row home model.

Instead of creating the neighborhood, students analyze the picture by asking:

- How many row homes are there?
- How many floors does each home have?
- How many windows are on each floor?

Students write the multiplication equation, find the product, and then color or decorate the neighborhood after completing the math.

This allows students to practice **visual thinking** by interpreting a model before creating one independently.

Extension (Students Ready for a Challenge)

After creating their neighborhood and writing the equation, challenge students to use the **Associative Property** by regrouping the factors.

Example:

Original:

$$4 \times 5 \times 3 = 60$$

Possible regroupings:

- $(4 \times 5) \times 3 = 60$
- $4 \times (5 \times 3) = 60$

Then ask:

- Does the product change?
- Why or why not?
- Explain how the same neighborhood can represent both equations.

For an additional challenge, students can create a second neighborhood that represents the regrouped equation or compare their work with a partner to identify equivalent groupings.

This extension deepens students' understanding of the Associative Property while reinforcing that changing the grouping of factors does not change the product.

TEACH

Assessment & Reflection

Teachers will assess student understanding by observing students as they create their Baltimore Row Home Architect designs and listening to the mathematical explanations. Teachers will look for evidence that students can:

- Identify the factors and product represented in their design
- Connect their architectural drawing to a multiplication equation
- Explain that changing the grouping of factors does not change the product

Teacher check in Questions:

- "What does each factor represent in your row home design?"
- "How did you group your factors the first time?"
- "How did you regroup them?"
- "How do you know the total number of windows stayed the same?"

Student Reflection Prompts:

- "How did your row home design show multiplication?"
- "What changed when you regrouped the factors? What stayed the same?"
- "How did patterns in architecture help you see multiplication?"
- "How can the Associative Property help you solve problems more easily?"

Differentiation

Grade Level Adjustments

Grade 2 (2.OA.A.1, 2.OA.C.4):

Students focus on building the foundation of multiplication through equal groups and repeated addition. Instead of using the Associative Property, students create row homes using repeated addition and write addition sentences to find the total.

- Provide pre-drawn row home templates
- Use smaller numbers
- Focus on identify groups and counting totals

Grade 4 (4.OA.A.3, 4.NBT.B.5)

Students extend the activity by designing larger neighborhoods and applying multiplication strategies with multi-digit factors.

- Calculate the total number of windows in multiple buildings
- Use Distributive Property to break apart larger multiplication problems