

Multi-Digit Multiplication: Partial Products & Ratio Tables

Tactile Concrete-Pictorial-Abstract (CPA) Station Guide • CCSS.MATH.4.NBT.B.5

Student Name: _____

Date: _____

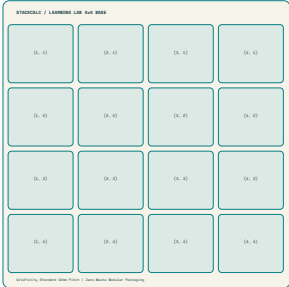
Model: SC-6

Check Score: ____ / 4

STUDENT SELF-CHECK RULE (NO CHEATING):
Build with blocks and solve on paper first! Use your SC-6 calculator ONLY to verify answers on the 4-line LCD screen.

STATION LAB TUTORIAL: BENCH SCHEMATIC & CPA PROGRESSION

1. 2D Bench Blueprint



Kit: Gridfinity Baseplate

2. Desk Setup (Concrete -> Pictorial)

Physical Bench Setup:
Model 4×23 on the desk as 4 rows of 20 and 4 rows of 3.

Sketch Model on Paper:
Draw an open array rectangle split into 20 and 3, height 4.

3. Step-by-Step LCD Stack Trace (SC-6)

MODE: 123 Base-10 Arithmetic

1. 4 X: 4 Multiplier 4 into X

2. ENTER Y: 4 | X: 4 Stack lift

3. 20 Y: 4 | X: 20 Tens part (20) into

4. * X: 80 1st partial product:

EXPECTED LCD X: 92

1

Calculate 3×42 using partial products: $(3 \times 40) + (3 \times 2)$.

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

2

Calculate 5×34 using partial products: $(5 \times 30) + (5 \times 4)$.

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

3

Calculate 6×52 using partial products: $(6 \times 50) + (6 \times 2)$.

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

4

A box holds 25 markers. How many in 8 boxes?

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

Station Diagnostic & Solution Key: Unit 1

Multi-Digit Multiplication: Partial Products & Ratio Tables • Manipulative Setup, Diagnostic Rubric & Verification Flow

MANIPULATIVE HARDWARE STATION INVENTORY & 3D PRINT PREPARATION

Station Kit: Gridfinity Baseplate & Stacking Blocks

CAD / STL Source File:

Recommended Filaments:

CAD Blueprint: gridfinity_baseplate

Education/scad/lib/gridfinity.scad

Charcoal 4x4 Baseplate & Teal Cubes (PLA)

Target Device: SC-6 Elementary

Standard: Gridfinity 42mm Pitch / 0.6mm Inset Markings

#	Math Problem Prompt	Expected Math Answer	Self-Check Keystrokes & RPN Stack
1	Calculate 3×42 using partial products: $(3 \times 40) + (3 \times 2)$ Standard: CCSS.MATH.4.NBT.B.5	126	[3] [ENTER] [4][0] [*] [3] [ENTER] [2]
2	Calculate 5×34 using partial products: $(5 \times 30) + (5 \times 4)$ Standard: CCSS.MATH.4.NBT.B.5	170	[5] [ENTER] [3][0] [*] [5] [ENTER] [4]
3	Calculate 6×52 using partial products: $(6 \times 50) + (6 \times 2)$ Standard: CCSS.MATH.4.NBT.B.5	312	[6] [ENTER] [5][0] [*] [6] [ENTER] [2]
4	A box holds 25 markers. How many in 8 boxes? Standard: CCSS.MATH.4.NBT.B.5	200 markers	[8] [ENTER] [2][5] [*]

TEACHER DIAGNOSTIC GUIDE: COMMON MISCONCEPTIONS & REMEDIATION

Key Misconception to Target During Station Observation:

Ensure students multiply the tens place value (20), not just the digit 2.

How the Manipulatives & Calculator Foster Self-Correction:

Students solve with pencil and physical blocks first. When they self-check on the SC-6, any discrepancy between their written answer and the calculator's 4-line LCD immediately prompts them to re-inspect their physical bench model or regrouping, turning errors into productive struggle without teacher intervention.

Station Facilitation & Pacing Tip:

Keep 3D printed trays docked on standard Gridfinity baseplates to prevent loose parts on student desks. Encourage students to articulate their CPA steps: name the block representation (Concrete), point to their drawn tape/bond model (Pictorial), and verify register values (Abstract).

CLASSROOM SCORING & STATION MASTERY RUBRIC

Exemplary (18–20 pts):

Complete, accurate manipulative sketches; exact math answers; independently verified self-check on LCD stack.

Proficient (14–17 pts):

Correct math answers; minor sketch omissions; verified on calculator with minimal teacher prompting.

Developing (10–13 pts):

Understands problem concept but made computational slips; successfully self-corrected using calculator LCD.

Intervention (<10 pts):

Relied on calculator before solving on paper, or struggled with underlying physical manipulative models.