

Paths to 20: Comparing Groups on the Number Rack

Tactile Concrete-Pictorial-Abstract (CPA) Station Guide • CCSS.MATH.K.CC.C.6

Student Name: _____

Date: _____

Model: SC-6

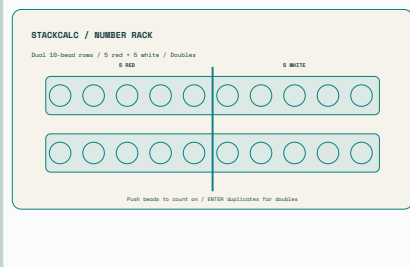
Check Score: ___ / 4

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: Number Rack

2. Desk Setup (Concrete -> Pictorial)

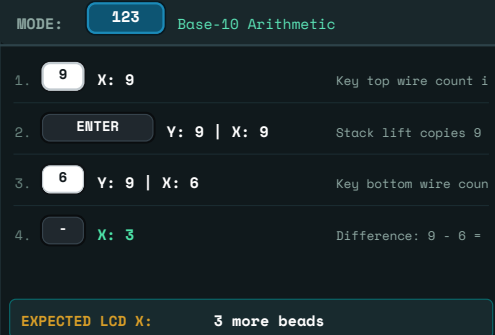
Physical Bench Setup:

Push 8 beads on top wire, 5 beads on bottom wire. Compare lengths visually.

Sketch Model on Paper:

Draw lines connecting top and bottom beads to see the difference.

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



1 Top row has 8, bottom row has 4. Difference?

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

2 Top row has 7, bottom row has 5. Difference?

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

3 Top row has 10, bottom row has 7. Difference?

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

4 Both rows have 6 beads. Difference?

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

Station Diagnostic & Solution Key: Unit 4

Paths to 20: Comparing Groups on the Number Rack • Manipulative Setup, Diagnostic Rubric & Verification Flow

MANIPULATIVE HARDWARE STATION INVENTORY & 3D PRINT PREPARATION

Station Kit: Number Rack (20-Bead Dual Rod)

CAD / STL Source File:

Recommended Filaments:

CAD Blueprint: number Rack

Education/scad/number Rack_parts.scad

White Frame with Signal Red & White Beads (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	Top row has 8, bottom row has 4. Difference? Standard: CCSS.MATH.K.CC.C.6	4	[8] [ENTER] [4] [-]
2	Top row has 7, bottom row has 5. Difference? Standard: CCSS.MATH.K.CC.C.6	2	[7] [ENTER] [5] [-]
3	Top row has 10, bottom row has 7. Difference Standard: CCSS.MATH.K.CC.C.6	3	[1][0] [ENTER] [7] [-]
4	Both rows have 6 beads. Difference? Standard: CCSS.MATH.K.CC.C.6	0	[6] [ENTER] [6] [-]

TEACHER DIAGNOSTIC GUIDE: COMMON MISCONCEPTIONS & REMEDIATION

Key Misconception to Target During Station Observation:
Reinforce that subtraction measures the space between two quantities.

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.