

# Figure the Facts with the Number Rack: Teen Numbers

Tactile Concrete-Pictorial-Abstract (CPA) Station Guide • CCSS.MATH.1.OA.C.6

Student Name: \_\_\_\_\_

Date: \_\_\_\_\_

Model: SC-6

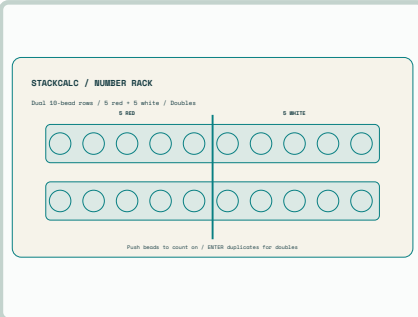
Check Score: \_\_\_ / 4

## 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



#### 2. Desk Setup (Concrete -> Pictorial)

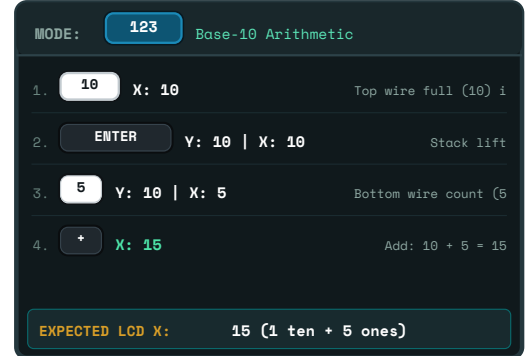
##### Physical Bench Setup:

Push full top wire (10) and 4 beads on bottom wire to show 14.

##### Sketch Model on Paper:

Draw 10 beads on top wire and 4 beads on bottom wire.

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



#### 1 Top row has 10, bottom row has 3. Total?

Manipulative Model &amp; Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

#### 2 Top row has 10, bottom row has 7. Total?

Manipulative Model &amp; Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

#### 3 You have 16 beads. Remove 6 from bottom.

Manipulative Model &amp; Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

#### 4 You have 19 beads. Remove 10 from top.

Manipulative Model &amp; Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

# Station Diagnostic & Solution Key: Unit 6

Figure the Facts with the Number Rack: Teen Numbers • Manipulative Setup, Diagnostic Rubric & Verification Flow

MANIPULATIVE HARDWARE STATION INVENTORY & 3D PRINT PREPARATION

Station Kit: Number Rack (20-Bead Stand)

CAD Blueprint: number Rack

Target Device: SC-6 Elementary

CAD / STL Source File:

Education/scad/number Rack\_parts.scad

Standard: Gridfinity 42mm Pitch / 0.6mm Inset Markings

Recommended Filaments:

White Frame with Signal Red & White Beads (PLA)

| # | Math Problem Prompt                                                                     | Expected Math Answer | Self-Check Keystrokes & RPN Stack |
|---|-----------------------------------------------------------------------------------------|----------------------|-----------------------------------|
| 1 | Top row has 10, bottom row has 3. Total?<br><small>Standard: CCSS.MATH.1.OA.C.6</small> | 13                   | [1][0] [ENTER] [3] [+]            |
| 2 | Top row has 10, bottom row has 7. Total?<br><small>Standard: CCSS.MATH.1.OA.C.6</small> | 17                   | [1][0] [ENTER] [7] [+]            |
| 3 | You have 16 beads. Remove 6 from bottom.<br><small>Standard: CCSS.MATH.1.OA.C.6</small> | 10                   | [1][6] [ENTER] [6] [-]            |
| 4 | You have 19 beads. Remove 10 from top.<br><small>Standard: CCSS.MATH.1.OA.C.6</small>   | 9                    | [1][9] [ENTER] [1][0] [-]         |

TEACHER DIAGNOSTIC GUIDE: COMMON MISCONCEPTIONS & REMEDIATION

Key Misconception to Target During Station Observation:

Watch for students treating teen numbers as two separate digits rather than 10 + ones.

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.