

Equations & Inequalities: One-Step Equations & Balance Scale

Tactile Concrete-Pictorial-Abstract (CPA) Station Guide • CCSS.MATH.6.EE.B.7

Student Name: _____

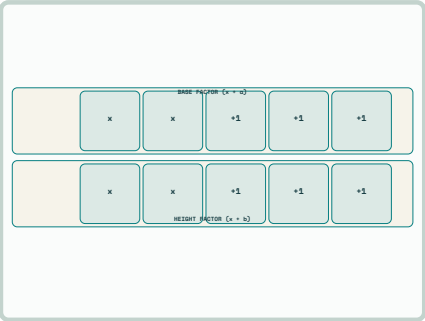
Date: _____

Model: SC-6

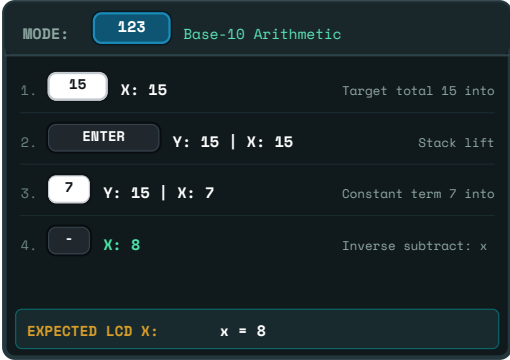
Check Score: ___ / 4

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: Algebra Stage

2. Desk Setup (Concrete -> Pictorial)
Physical Bench Setup:
Place unknown box x and 5 unit cubes on left pan; place 12 cubes on right pan. Remove 5 from both.
Sketch Model on Paper:
Draw a two-pan balance scale with $x + 5$ on left, 12 on right.

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


1 Solve $x + 8 = 25$ on the stack.

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

2 Solve $x - 7 = 15$ on the stack.

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

3 Solve $5x = 45$ on the stack.

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

4 Solve $x / 6 = 8$ on the stack.

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

Station Diagnostic & Solution Key: Chapter 7

Equations & Inequalities: One-Step Equations & Balance Scale • Manipulative Setup, Diagnostic Rubric & Verification Flow

MANIPULATIVE HARDWARE STATION INVENTORY & 3D PRINT PREPARATION

Station Kit: Tactile Algebra Stage & Balance Blocks

CAD / STL Source File:

Recommended Filaments:

CAD Blueprint: algebra_stage

Education/build/scad/algebra_stage.scad

Oceanic Teal Stage Frame & White Algebra Tiles (PLA)

Target Device: SC-6 / SC-32 Bridge

Standard: Gridfinity 42mm Pitch / 0.6mm Inset Markings

#	Math Problem Prompt	Expected Math Answer	Self-Check Keystrokes & RPN Stack
1	Solve $x + 8 = 25$ on the stack. Standard: CCSS.MATH.6.EE.B.7	$x = 17$	[2][5] [ENTER] [8] [-]
2	Solve $x - 7 = 15$ on the stack. Standard: CCSS.MATH.6.EE.B.7	$x = 22$	[1][5] [ENTER] [7] [+]
3	Solve $5x = 45$ on the stack. Standard: CCSS.MATH.6.EE.B.7	$x = 9$	[4][5] [ENTER] [5] [÷]
4	Solve $x / 6 = 8$ on the stack. Standard: CCSS.MATH.6.EE.B.7	$x = 48$	[8] [ENTER] [6] [×]

TEACHER DIAGNOSTIC GUIDE: COMMON MISCONCEPTIONS & REMEDIATION

Key Misconception to Target During Station Observation:

Emphasize performing the exact same operation to both sides of the balance.

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.