

Fractions & Decimals: Proportional Towers & Two-Dot Notation

Tactile Concrete-Pictorial-Abstract (CPA) Station Guide • CCSS.MATH.4.NF.A.2

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

STACKCALC 3/7	FRACTION STUDIO 3/8	1/8	1/10	1/11	1/12
774	874	874	1074	1174	1274
1	1/2	1/3	1/4	1/5	1/6
880.5	160.2	280	470	670	870

Kit: Fraction Tray

2. Desk Setup (Concrete -> Pictorial)

Physical Bench Setup:

Compare a 3/4 tower (63mm) and a 5/8 tower (52.5mm). Observe 3/4 is taller.

Sketch Model on Paper:

Draw two equal bars: shade 3/4 and 5/8 to compare visually.

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

MODE: **FDISP** Fraction Studio

1. **3/4** X: 3/4 Key 3/4 (.3.4) into

2. **ENTER** Y: 3/4 | X: 3/4 Stack lift

3. **5/8** Y: 3/4 | X: 5/8 Key 5/8 (.5.8) into

4. **-** X: 1/8 Subtract: 3/4 - 5/8

EXPECTED LCD X: 1/8 (0.1250)

1 Compare 3/4 and 1/2. Subtract: 3/4 - 1/2.

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

2 Convert 7/10 to decimal on LCD: [7] [ENTER] [10] [+].

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

3 Convert 50/100 to reduced fraction using [SIMP].

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

4 Add 5/10 and 35/100 as decimals.

Manipulative Model & Desk Sketch (Show your work):

Final Math Answer:

☐ Verified on SC-6

Station Diagnostic & Solution Key: Unit 3

Fractions & Decimals: Proportional Towers & Two-Dot Notation • Manipulative Setup, Diagnostic Rubric & Verification Flow

MANIPULATIVE HARDWARE STATION INVENTORY & 3D PRINT PREPARATION

Station Kit: Fraction Studio Towers (84.0mm Whole)

CAD / STL Source File:

Recommended Filaments:

CAD Blueprint: fraction_tray

Education/scad/fraction_studio_parts.scad

Teal 3x1 Bin & Color-Coded Towers (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	Compare 3/4 and 1/2. Subtract: 3/4 - 1/2. Standard: CCSS.MATH.4.NF.A.2	1/4	[. 3 . 4] [ENTER] [. 1 . 2] [-]
2	Convert 7/10 to decimal on LCD: [7] [ENTER] Standard: CCSS.MATH.4.NF.A.2	0.70	[7] [ENTER] [1][0] [÷]
3	Convert 50/100 to reduced fraction using [SI] Standard: CCSS.MATH.4.NF.A.2	1/2	[. 50 . 100] [SIMP]
4	Add 5/10 and 35/100 as decimals. Standard: CCSS.MATH.4.NF.A.2	0.85 (85/100)	[0][.][5] [ENTER] [0][.][3][5] [+]

TEACHER DIAGNOSTIC GUIDE: COMMON MISCONCEPTIONS & REMEDIATION

Key Misconception to Target During Station Observation:

Do not compare fractions by looking only at numerators or denominators in isolation.

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.