1-to-1 Correspondence: Stepping Up by One

Numbers to 5 & 10 • Standard: CCSS.MATH.K.CC.B.4

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1. MATHEMATICAL CONCEPT & STACK APPROACH: Establish one-to-one correspondence between physical digit blocks and step tokens on the Place Value Tray and verify counts.

Counting by ones is repeated addition of the unit 1 ($n \to n + 1$). On the Place Value Tray and the stack, your current count waits first while you bring in 1 more step, then both combine into the new total.

2. MODELING WITH BLOCKS & STUDENT PREDICTION

Published Block Kit: Place Value Studio (Digit Blocks 0–9 & Gold [+1] Step Tokens)

Hands-On Setup: Place the [1] Digit Block into the Ones socket of the Place Value Tray. Keep Gold [+1] step tokens ready beside the tray.

Student Prediction (Before Calculator): When we place 1 Gold [+1] step token and step the Ones block up by 1, what digit block replaces [1]? (Prediction: [2])

3. CALCULATOR EXECUTION (SC-6 KEYCAPS & 4-LEVEL STACK TRACE)

Keystroke Flow: 1 ENTER 1 + 1 +

Key Pressed	Screen (X)	Internal 4-Level Stack Effect (T, Z, Y, X)
1	1	First count placed: 1 enters register X
ENTER	1	1 copied to register Y: holds the current count
1	1	Gold [+1] step token added: 1 enters register X
+	2	Press [+]: 1 + 1 = 2! Swap Ones block to [2]
1	1	Next Gold [+1] step token added: 1 enters X
+	3	Press [+]: 2 + 1 = 3! Tray [3] and screen match perfectly

4. CONTEXT (How Ten Fingers & an Empty Shell Created Place Value) • From Blocks to the Stack (SC-6 Manual) — Ch. 3: Counting, Subitizing & Place Value + Appendix B: Station F.1

Long before paper or keyboards existed, ancient shepherds counted flocks with clay pebbles ('calculi' in Latin—the root of the word 'calculate'!) and Maya astronomers drew a shell for zero so an empty place-value column had its own symbol. Stepping one [+1] token at a time on the Place Value Tray makes the 1-to-10 counting staircase tangible.

Core Investigation (Student Warm-Up A):

Place the [4] Digit Block in the Ones column of your Place Value Tray and add 1 Gold [+1] step token. What total quantity do you have now?

Teacher Answer Key: 5 ([5] Digit Block; 4 + 1 = 5).

More, Less & Zero: Finding Differences

Comparing Sets & Magnitude • Standard: CCSS.MATH.K.CC.C.6

1. FOLLOW-UP EXTENSION CONCEPT, BLOCKS & PREDICTION

Concept & Stack Approach: Comparison subtraction finds the difference ('how many more?') between two quantities. Placing the larger group on the top row (Shelf Y) and the smaller group on the bottom row (Shelf X) shows how much remains when the matching part is taken away.

Blocks & Prediction: Place the [5] Digit Block in Row 1 (top row) and the [2] Digit Block in Row 0 (bottom row) of the Ones column on the Place Value Tray. Prediction: Look at the two rows on the tray. Which row has the larger quantity? How many more is 5 than 2?

2. EXTENSION CALCULATOR SEQUENCE & STACK TRACE

5 ENTER 2 -

Key Pressed	Screen (X)	Internal 4-Level Stack Effect
5	5	Row 1 quantity (5) enters register X
ENTER	5	5 lifted to register Y (first set)
2	2	Row 0 quantity (2) enters register X
-	3	Minus subtracts X from Y: Row 1 has 3 more!

3. TARGET MISCONCEPTIONS & HANDS-ON BLOCK REMEDIATIONS

Misconception 1: Reciting number names faster than placing physical step tokens (losing 1-to-1 correspondence).

Hands-On Block Remediation: Have the student place 1 Gold [+1] token on the Place Value Tray and step the Ones Digit Block first, say the number aloud, and only then press [1] [+] so the tray and Register X stay locked in step.

Misconception 2: Confusing the action of adding 1 more with the total quantity on the tray (cardinality).

Hands-On Block Remediation: Ask the student to point to the Digit Block in the Ones socket of the Place Value Tray and verify that its numeral matches Register X on the screen.

Extension Challenge (Student Warm-Up B):

Row 1 holds [6] and Row 0 holds [2] on your Place Value Tray. Which row has more, and how many more does it have?

My Paper Answer: _____ **[ ] Verified on SC-6 (Online Key: stackcalc.io/curriculum/answers)**

STUDENT LAB WORKSHEET • UNIT 01 (SC-6)

Counting, Cardinality & The One-More Step Counter

Name: _____ Date: _____ Class: _____

STUDENT REFERENCE GUIDE: HOW COUNTING & PLACE VALUE WORK TOGETHER

- Numbers show quantity (cardinality): the Digit Block in the Ones socket shows how many items you have counted.
- Adding 1 more item steps the count up by 1 ($n \to n + 1$): 1 becomes 2, 2 becomes 3, and 3 becomes 4.
- An empty tray has zero items, represented by the [0] Digit Block in the Ones socket.

Key Sequence: `1` `ENTER` `1` `+` `1` `+`

Investigation 1: Place [3] in the top row and [2] in the bottom row of your Place Value Tray. Combine both groups—what is the total?

1. Draw Your Blocks on the Tray:



2. Number Bond & Two Quantities:

First Quantity (Top Row): _____

Second Quantity (Bottom Row): _____

Combine (+, −, or ×): _____

3. My Prediction:

_____

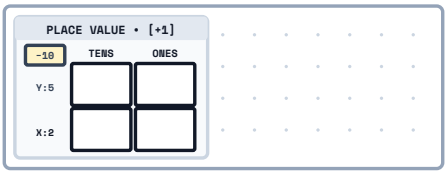
Final Verified Answer:

_____

[ ] Checked on SC-6

Investigation 2: You have 5 ones on the tray and take away 2. What Digit Block shows how many ones remain?

1. Draw Your Blocks on the Tray:



2. Number Bond & Two Quantities:

First Quantity (Top Row): _____

Second Quantity (Bottom Row): _____

Combine (+, −, or ×): _____

3. My Prediction:

_____

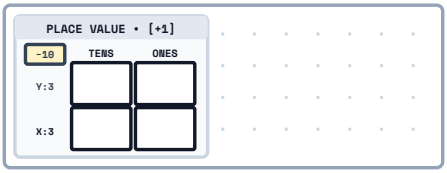
Final Verified Answer:

_____

[ ] Checked on SC-6

Investigation 3: You have 3 blocks on the tray and take away all 3. How many blocks are left, and which Digit Block shows an empty tray?

1. Draw Your Blocks on the Tray:



2. Number Bond & Two Quantities:

First Quantity (Top Row): _____

Second Quantity (Bottom Row): _____

Combine (+, −, or ×): _____

3. My Prediction:

_____

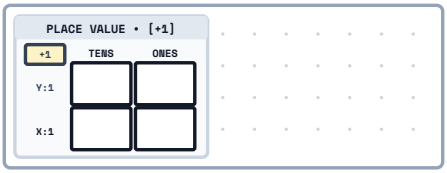
Final Verified Answer:

_____

[ ] Checked on SC-6

Investigation 4: Start with [1] in the Ones socket and add one more [+1] token three times in a row. What count do you reach?

1. Draw Your Blocks on the Tray:



2. Number Bond & Two Quantities:

First Quantity (Top Row): _____

Second Quantity (Bottom Row): _____

Combine (+, −, or ×): _____

3. My Prediction:

_____

Final Verified Answer:

_____

[ ] Checked on SC-6

Unit 01 Practice A: Core Fluency

Name: _____ Date: _____ Score: _____ / 10

TIER 1 • LEVEL 1: BUILDER FOUNDATION • STUDY THESE 2 WORKED EXAMPLES BEFORE SOLVING PRACTICE A (#1–#10) ON PAPER FIRST

EXAMPLE 1 **Count 5 dots, then add 1 more [+1] token.**

Start at 5 in Ones socket → step up 1 → 5 + 1 = 6.

Verified Answer: 6

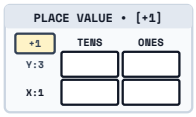
EXAMPLE 2 **Start at 7 on the tray and step up 2 times (+1, +1).**

7 + 1 = 8, then 8 + 1 = 9. Key: [7] [ENTER] [1] [+] [1] [+].

Verified Answer: 9

1 Tier 1 • Builder

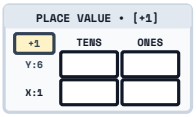
Count 3 blocks and add 1 more: 3 + 1 =



Paper Step: _____ [ ] SC-6 Ans: _____

2 Tier 1 • Builder

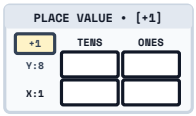
Count 6 blocks and add 1 more: 6 + 1 =



Paper Step: _____ [ ] SC-6 Ans: _____

3 Tier 1 • Builder

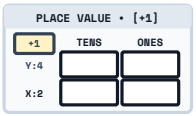
Count 8 blocks and add 1 more: 8 + 1 =



Paper Step: _____ [ ] SC-6 Ans: _____

4 Tier 1 • Builder

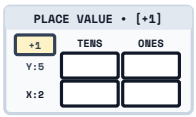
Start at 4 and step up 2 times: 4 + 1 + 1 =



Paper Step: _____ [ ] SC-6 Ans: _____

5 Tier 1 • Builder

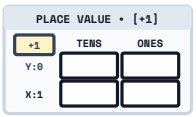
Start at 5 and step up 2 times: 5 + 1 + 1 =



Paper Step: _____ [ ] SC-6 Ans: _____

6 Tier 1 • Builder

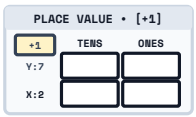
An empty tray has 0 blocks. Add 1 block: 0 + 1 =



Paper Step: _____ [ ] SC-6 Ans: _____

7 Tier 1 • Builder

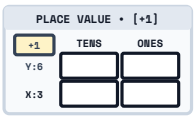
Count 7 dots in the ten-frame and add 2 more: 7 + 2 =



Paper Step: _____ [ ] SC-6 Ans: _____

8 Tier 1 • Builder

Start at 6 and step up 3 times: 6 + 1 + 1 + 1 =



Paper Step: _____ [ ] SC-6 Ans: _____

9 Tier 1 • Builder

Count 9 blocks and add 1 more to fill the ten-frame: 9 + 1 =



Paper Step: _____ [ ] SC-6 Ans: _____

10 Tier 1 • Builder

Start at 5 and add 3 step tokens: 5 + 1 + 1 + 1 =



Paper Step: _____ [ ] SC-6 Ans: _____