

Big Ideas Math Middle School: Hands-On Block & SC-6 Supplement

Section-by-Section Textbook Methods, Step-by-Step Manipulative Block Instructions, Worked Examples & 450 Practice Problems

1. BIG IDEAS TEXTBOOK METHODS

Every section aligns directly to Big Ideas Math (Units 1–10) and tracks the exact textbook methods: Factor Trees, Tape Diagrams, Ratio Tables, LCD Towers, Area Models, Balance Scales, Nets, and Box Plots.

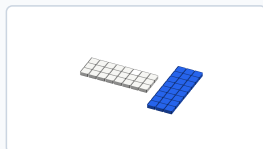
2. STEP-BY-STEP BLOCK KITS

Each section names the exact StackCalc Block Kit used and walks through Step 1, Step 2, and Step 3 with physical blocks alongside 1 clear Worked Example showing both the textbook method and SC-6 keystrokes.

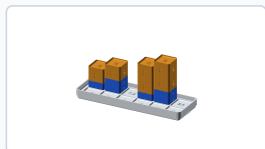
3. WORKSPACE & +10 SCOREBOARD

Every problem gives open workspace to work out the math and write the final answer—never the calculator stack! Optional QUEST-01 Scoreboard: 1 block = +10 pts (1st Way), 2 blocks = +20 pts (2nd Way).

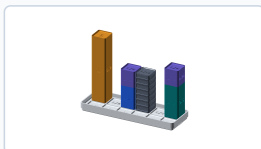
MANIPULATIVE BLOCK KITS & THE 3x1x7U SC-6 SCOREBOARD KIT (QUEST-01)



COUNT-01: Array Tiles



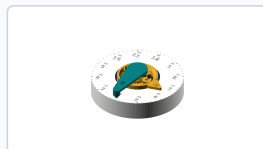
PRIME-01: Prime Towers



FRAC-01: 84mm Fractions



ALGB-01: Algebra Stage



TIME-01: Geared Clock

UNIT / CHAPTER & BIG IDEAS ALIGNMENT	SECTIONS & WORKBOOK PAGES	BIG IDEAS TEXTBOOK METHODS
Unit 1: Numerical Expressions & Factors Big Ideas Math Grade 6 — Chapter 1 • Counting & Array Studio (COUNT-01) + Prime Factor Studio (PRIME-01)	[] Sec 1.1 (p.2): Whole Number Operations & Division with Remainders [] Sec 1.2 (p.3): Powers & Exponents — Squares, Cubes & Growth [] Sec 1.3 (p.4): Order of Operations — Grouping Symbols, Exponents & PEMDAS [] Sec 1.4 (p.5): Prime Factorization — Factor Trees & Logarithmic Prime Towers [] Sec 1.5 (p.6): Greatest Common Factor (GCF) & Least Common Multiple (LCM)	Arrays, Factor Trees & Venn GCF/LCM Kit: Counting & Array Studio (COUNT-01) [] Unit 1 Complete (50/50)
Unit 2: Fractions & Decimals Big Ideas Math Grade 6 — Chapter 2 • Fraction Studio (FRAC-01) + Place Value Studio (PLACE-01)	[] Sec 2.1 (p.7): Equivalent Fractions, Mixed Numbers & Adding Towers [] Sec 2.2 (p.8): Multiplying Fractions & Mixed Numbers [] Sec 2.3 (p.9): Dividing Fractions & Mixed Numbers — Why Reciprocal Flip Works [] Sec 2.4 (p.10): Adding, Subtracting & Multiplying Decimals [] Sec 2.5 (p.11): Dividing Decimals & The 3-Way Fraction-Decimal-Remainder Tr..	LCD Towers, Reciprocals & Place Value Kit: Fraction Studio (FRAC-01) [] Unit 2 Complete (50/50)
Unit 3: Ratios, Rates & Percents Big Ideas Math Grade 6 — Chapters 3, 4 & 5 (Ratios, Rates & Percents) • Counting & Array Tiles (COUNT-01) + Fraction Studio (FRAC-01)	[] Sec 3.1 (p.12): Ratios & Tape Diagrams — Part-to-Part vs. Part-to-Whole [] Sec 3.2 (p.13): Ratio Tables & Double Number Lines via [g] [REP] [] Sec 3.3 (p.14): Unit Rates & Best-Buy Showdowns (Plus [x÷y] Swap Rescue) [] Sec 3.4 (p.15): Percents, Fractions & Decimals — The 3-Costume Switcher [] Sec 3.5 (p.16): Discounts, Percent Change ([g] [%CHG]) & Unit Conversions	Tape Diagrams, Ratio Tables, Rates & % Kit: Counting & Array Tiles (COUNT-01) [] Unit 3 Complete (50/50)
Unit 4: Algebraic Expressions & Properties Big Ideas Math Grade 6 — Chapter 3 / Chapter 5 (Algebraic Expressions) • Algebra Boxes & Factoring Stage (ALGB-01) + Counting Tiles (COUNT-01)	[] Sec 4.1 (p.17): Evaluating Algebraic Expressions — Variable Boxes on the Stack [] Sec 4.2 (p.18): Combining Like Terms — Why x² Flats, x Rods & 1 Cubes Never.. [] Sec 4.3 (p.19): The Distributive Property — One Split Rectangle, Two Ways [] Sec 4.4 (p.20): Factoring Expressions with GCF — Reverse the Rectangle	Substitution, Like Terms, Area & GCF Kit: Algebra Boxes & Factoring Stage (A.. [] Unit 4 Complete (40/40)
Unit 5: Areas of Polygons & Elapsed Time Big Ideas Math Grade 6 — Chapter 4 (Areas of Polygons) • Counting & Array Tiles (COUNT-01) + Planetary Geared Clock (TIME-01)	[] Sec 5.1 (p.21): Areas of Parallelograms & Rectangles ([f] [RECT]) [] Sec 5.2 (p.22): Areas of Triangles — Half a Rectangle ([g] [TRI]) [] Sec 5.3 (p.23): Trapezoids & Composite Figures with the [Σ+] Running Ledger [] Sec 5.4 (p.24): Coordinate Polygons & Planetary Clock Base-60 Time ([CLK])	Cut-and-Slide Polygons, Trapezoids & Time Kit: Counting & Array Tiles (COUNT-01) [] Unit 5 Complete (40/40)
Unit 6: Integers, Rational Numbers & The Coordinate Plane Big Ideas Math Grade 6 — Chapter 6 • Ten-Frame Bicolor Counters (BASE-10) + Number Rack (RACK-01)	[] Sec 6.1 (p.25): Positive & Negative Integers — Zero Pairs & The [+/-] Sign Flipper [] Sec 6.2 (p.26): Comparing & Ordering Integers and Rational Numbers [] Sec 6.3 (p.27): Absolute Value — Distance From Zero Is Always Positive ([g] [X I]) [] Sec 6.4 (p.28): The 4-Quadrant Coordinate Plane & Axis Reflections [] Sec 6.5 (p.29): Distance Between Points on the Coordinate Plane ([g] [X I])	Number Lines, Opposites, x & 4-Quad Kit: Ten-Frame Bicolor Counters (BASE-10) [] Unit 6 Complete (50/50)
Unit 7: Equations & Inequalities Big Ideas Math Grade 6 — Chapter 7 • Algebra Boxes & Stage (ALGB-01) + Number Rack (RACK-01)	[] Sec 7.1 (p.30): Writing Equations & Testing Solutions — The Balance Scale Rule [] Sec 7.2 (p.31): Solving One-Step Addition & Subtraction Equations ([f] [LASTX]) [] Sec 7.3 (p.32): Solving One-Step Multiplication & Division Equations [] Sec 7.4 (p.33): Writing, Graphing & Solving Inequalities ([f] [X-], [g] [X-], [f] [X+], [g] [X+] [] Sec 7.5 (p.34): Two-Variable Relationships (y = kx and y = x + b) — Tables & Gr..	Balance Scale Inverse Ops & Inequalities Kit: Algebra Boxes & Stage (ALGB-01) [] Unit 7 Complete (50/50)
Unit 8: Surface Area & Volume of 3D Solids Big Ideas Math Grade 6 — Chapter 8 • Counting & Array Tiles (COUNT-01) + Gridfinity 3x1 Storage Boxes	[] Sec 8.1 (p.35): 3D Solids, Nets & Surface Area of Rectangular Prisms ([f] [RECT.. [] Sec 8.2 (p.36): Surface Area of Triangular Prisms & Pyramids ([f] [RECT] + [g] [.. [] Sec 8.3 (p.37): Volume of Rectangular Prisms with Whole & Fractional Edges ([f.. [] Sec 8.4 (p.38): Circles, Cones & Right-Triangle Hypotenuse ([tr], [f] [CIRC], [g] [..	2D Prism/Pyramid Nets, V=lwh, π & Cones Kit: Counting & Array Tiles (COUNT-01) [] Unit 8 Complete (40/40)
Unit 9: Statistical Measures & Data Displays Big Ideas Math Grade 6 — Chapters 9 & 10 (Statistical Measures and Data Displays) • Counting & Array Tiles (COUNT-01) + Probability Dice Studio	[] Sec 9.1 (p.39): Dot Plots, Frequency & Mean as 'Fair Share Leveling' ([Σ+], [g] [.. [] Sec 9.2 (p.40): Median, Mode & Range — One Data Entry, Five Instant Answers! [] Sec 9.3 (p.41): Quartiles, Interquartile Range ([IQR]) & Box-and-Whisker Plots [] Sec 9.4 (p.42): Mean Absolute Deviation ([g] [MAD]) Without the 20-Minute Nigh..	Dot Plots, Fair-Share Mean, IQR & MAD Kit: Counting & Array Tiles (COUNT-01) [] Unit 9 Complete (40/40)
Unit 10: Grade 7 Bridge — Signed Rationals, 2-Step Equat.. Big Ideas Math Grade 7 Bridge — Chapters 1–3 & Chapter 7 • Ten-Frame Zero-Pair Counters (BASE-10) + Algebra Stage (ALGB-01) + Probability	[] Sec 10.1 (p.43): Adding & Subtracting Signed Numbers — Why 'Minus a Negati.. [] Sec 10.2 (p.44): Multiplying & Dividing Signed Rationals — The Light-Switch Flip.. [] Sec 10.3 (p.45): Solving Two-Step Equations (ax + b = c) — Unwrapping in Rev.. [] Sec 10.4 (p.46): Probability, Combinatorics & Graduation Quiz Sprint ([DICE], [x ..	Zero-Pair Chips, 2-Step Eq. & Probability Kit: Ten-Frame Zero-Pair Counters (BASE.. [] Unit 10 Complete (40/40)

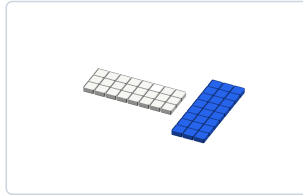
Section 1.1: Whole Number Operations & Division with Remainders

Big Ideas Method: Rectangular Array Model & Division Check (Dividend = Divisor × Quotient + Remainder)

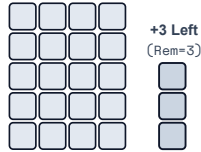
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CONCEPT SUMMARY & TEXTBOOK CONNECTION:

When you divide real items (like 23 tiles into groups of 4), a decimal like 5.75 hides the actual leftover pieces. Grouping physical Counting Tiles shows the full rows (Quotient) and loose tiles (Remainder), while [g] [+R] puts Quotient on Floor 1 (X) and Remainder on Floor 2 (Y) at the same time!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)

5 Rows of 4 (=20)

**HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):**

- Step 1:** Open Kit COUNT-01 (Counting & Array Tiles) and count out 23 unit tiles onto the Gridfinity baseplate.
- Step 2:** Arrange the tiles into equal rows of 4. Count 5 complete rows of 4 tiles ($5 \times 4 = 20$ tiles).
- Step 3:** Place the 3 leftover tiles beside the array as Remainder $R = 3$, proving $23 = 4 \times 5 + 3$.

WORKED EXAMPLE — EXAMPLE 1: QUOTIENT & REMAINDER WITH BLOCKS + [G] [+R]**Problem:** Divide $23 \div 4$ and find the quotient and remainder.**Big Ideas Textbook Method (Rectangular Array Model & Division Check (Dividend = Divisor × Quotient..**

- Divide $23 \div 4$ to find the greatest whole number of groups of 4: 5 groups ($5 \times 4 = 20$).
- Subtract $23 - 20 = 3$ to find the remainder ($R = 3$, which is less than the divisor 4).
- Check with the Division Algorithm: Quotient × Divisor + Remainder = $5 \times 4 + 3 = 23$.

Block Connection (COUNT-01): Snap 23 Counting Tiles into rows of 4. You build 5 full rows (20 tiles) with 3 leftover tiles.

SC-6 Keystrokes:

23 ENTER 4 g +R

Answer: 5 R 3

Floor 1 (X) shows 5 full rows; Floor 2 (Y) shows 3 left..

SECTION 1.1 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Rectangular Array Model & Division Check (Dividend = Divisor × ..

- 1** Big Ideas Method: Equal-Rows Array
Arrange 31 tiles into rows of 6. Find Quotient & Remainder.

Work:

Answer: _____

- 2** Big Ideas Method: Equal-Rows Array
Divide $47 \div 5$ using tiles or [g] [+R].

Work:

Answer: _____

- 3** Big Ideas Method: Equal-Rows Array
Divide $58 \div 7$ and check with [f] [LASTX] [×] [+].

Work:

Answer: _____

- 4** Big Ideas Method: Equal-Rows Array
Divide $85 \div 9$. How many full groups of 9 and how many left?

Work:

Answer: _____

- 5** Big Ideas Method: Quotient & Remainder
Divide $146 \div 12$. Find the Quotient and Remainder.

Work:

Answer: _____

- 6** Big Ideas Method: Quotient & Remainder
Divide $250 \div 36$ and prove with [f] [LASTX] [×] [+].

Work:

Answer: _____

- 7** Big Ideas Method: Quotient & Remainder
Find the missing dividend: Quotient = 14, Divisor = 8, Remainder = 5.

Work:

Answer: _____

- 8** Big Ideas Method: Quotient & Remainder
Spot the Glitch: Sam says $75 \div 8 = 8 \text{ R } 11$. Why is $R=11$ impossible? Fix it!

Work:

Answer: _____

- 9** Application & 2-Way Check: Division Check ($q \times d + r$)
A 3D spool has 300g of PLA. Each box takes 42g. How many full boxes can you print, and how much PLA is left?

Work:

Answer: _____

- 10** Application & 2-Way Check: Division Check ($q \times d + r$)
115 students ride vans that hold 14 kids each. How many vans must be booked so nobody is left behind?

Work:

Answer: _____

Section 1.2: Powers & Exponents — Squares, Cubes & Growth

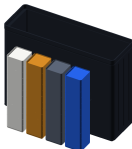
Big Ideas Method: Repeated Multiplication Factors, Perfect Squares (2D Array) & Cubes (3D Stack)

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

An exponent tells how many times to use the base as a factor in repeated multiplication. A 2nd power (4^2) builds a 2D square array ($4 \times 4 = 16$ tiles), and a 3rd power (4^3) stacks 4 square layers into a 3D cube (64 tiles). Evaluate powers using repeated multiplication or $[x^*]$, $[g]$ $[x^*]$, and $[g]$ $[y^*x]$!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)



$4^2 = 4 \times 4$ (16)



NOT 4×2 (8)!



HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):

Step 1: Open Kit COUNT-01 (Counting & Array Tiles) and lay down a row of 4 tiles for the base (4).

Step 2: For 4^2 , build a 4×4 square array (4 rows of 4 = 16 tiles)—compare to 2 rows of 4 ($4 \times 2 = 8$ tiles).

Step 3: For 4^3 , stack 4 identical 4×4 square layers high to build a 3D cube of $16 \times 4 = 64$ tiles.

WORKED EXAMPLE — EXAMPLE 1: SQUARES & CUBES WITH TILES AND $[X^*]$ / $[G]$ $[X^*]$

Problem: Write 4^2 and 4^3 as repeated multiplication and find their values. Compare 4^2 to 4×2 .

Big Ideas Textbook Method (Repeated Multiplication Factors, Perfect Squares (2D Array) & Cubes (3D..

1. Identify the base (4) and the exponent (2 or 3).
2. Write the power as repeated multiplication of the base: $4^2 = 4 \times 4 = 16$.
3. For 4^3 , multiply the base 3 times: $4^3 = 4 \times 4 \times 4 = 16 \times 4 = 64$ (never multiply base $\times$ exponent!).

Block Connection (COUNT-01): Build a 4×4 square of tiles (16 tiles). Stack 4 layers high for 4^3 (64 tiles). Notice 4×2 is only 2 rows of 4 (8 tiles)!

SC-6 Keystrokes: 4 x* 4 g x*

Answer: $4^2 = 16$, $4^3 = 64$ *$[x^*]$ squares the base; $[g]$ $[x^*]$ cubes the base!*

SECTION 1.2 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER Method Focus: Repeated Multiplication Factors, Perfect Squares (2D Array) & C..

1 Big Ideas Method: Repeated Factors ($b \times b$)

Write 5^2 as repeated multiplication and find how many tiles are in a 5×5 square.

Work: _____

Answer: _____

2 Big Ideas Method: Repeated Factors ($b \times b$)

Evaluate 7^2 and compare it to 7×2 .

Work: _____

Answer: _____

3 Big Ideas Method: Repeated Factors ($b \times b$)

Evaluate 3^3 (a $3 \times 3 \times 3$ cube of blocks).

Work: _____

Answer: _____

4 Big Ideas Method: Repeated Factors ($b \times b$)

Evaluate 5^3 using repeated multiplication or $[g]$ $[x^*]$.

Work: _____

Answer: _____

5 Big Ideas Method: Square & Cube Evaluation

Evaluate 2^5 by writing the repeated factors and checking with 2 [ENTER] 5 [g] $[y^*x]$.

Work: _____

Answer: _____

6 Big Ideas Method: Square & Cube Evaluation

Evaluate 6^4 using repeated multiplication or $[g]$ $[y^*x]$.

Work: _____

Answer: _____

7 Big Ideas Method: Square & Cube Evaluation

Evaluate 10^4 and 1^4 . How many zeros are in 10^4 ?

Work: _____

Answer: _____

8 Big Ideas Method: Square & Cube Evaluation

Spot the Glitch: Mia wrote $2^4 = 8$ because $2 \times 4 = 8$. Find the true value of 2^4 .

Work: _____

Answer: _____

9 Application & 2-Way Check: Exponential Growth Model

A cell doubles every hour (2^n). How many cells are there after 6 hours (2^6)? Solve 2 ways!

Work: _____

Answer: _____

10 Application & 2-Way Check: Exponential Growth Model

Mystery Cube: A giant cube uses 216 unit blocks. How many blocks wide is 1 edge? (Try $[g]$ $[x^*y]$!)

Work: _____

Answer: _____

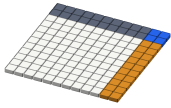
Section 1.3: Order of Operations — Grouping Symbols, Exponents & PEMDAS

Big Ideas Method: Order of Operations (PEMDAS: Grouping Symbols -> Powers -> Multiply/Divide L-to-R -> Add/Subtr..

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Big Ideas Order of Operations (PEMDAS): (1) Evaluate expressions inside grouping symbols ((), [], or fraction bars first; (2) Evaluate powers; (3) Multiply and divide from left to right; (4) Add and subtract from left to right. Grouping tiles on your desk lets you solve each part step by step!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)

GROUP 1 TILES:

$$8 + 4 = 12$$

GROUP 2 TILES:

$$9 - 3 = 6$$

$$\Rightarrow 72$$

HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):

Step 1: Open Kit COUNT-01 (Counting & Array Tiles) and use two zones of the lid for the two parentheses groups.

Step 2: In Zone 1, combine 8 tiles and 4 tiles to model $(8 + 4) = 12$ tiles.

Step 3: In Zone 2, start with 9 tiles and remove 3 tiles to model $(9 - 3) = 6$, then multiply 12 groups of 6 = 72.

WORKED EXAMPLE — EXAMPLE 1: GROUPING SYMBOLS & ORDER OF OPERATIONS

Problem: Evaluate $(8 + 4) \times (9 - 3)$ using the Big Ideas Order of Operations.

Big Ideas Textbook Method (Order of Operations (PEMDAS: Grouping Symbols -> Powers -> Multiply/..

1. Grouping Symbols First: Evaluate inside both sets of parentheses: $(8 + 4) = 12$ and $(9 - 3) = 6$.
2. Substitute the simplified values back into the expression: 12×6 .
3. Multiply to find the final value: $12 \times 6 = 72$.

Block Connection (COUNT-01): Group 1 has $8 + 4 = 12$ tiles. Group 2 has $9 - 3 = 6$ tiles. Multiply the two groups: $12 \times 6 = 72$!

SC-6 Keystrokes:

8

ENTER

4

+

9

ENTER

3

-

x

Answer: 72

$$(8 + 4) \times (9 - 3) = 12 \times 6 = 72!$$

SECTION 1.3 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Order of Operations (PEMDAS: Grouping Symbols -> Powers -> Mult..

- 1** Big Ideas Method: Grouping Symbols First
Evaluate $5 + 2 \times 3$. Multiply before adding!

Work:

Answer: _____

- 2** Big Ideas Method: Grouping Symbols First
Evaluate $(14 + 6) \div (7 - 2)$. Solve both parentheses first!

Work:

Answer: _____

- 3** Big Ideas Method: Grouping Symbols First
Evaluate $30 - 4 \times 6$.

Work:

Answer: _____

- 4** Big Ideas Method: Grouping Symbols First
Evaluate $(9 + 3) \times (15 - 8)$.

Work:

Answer: _____

- 5** Big Ideas Method: PEMDAS Step-by-Step
Evaluate $50 - (3 + 4)^2$. Square the sum before subtracting from 50!

Work:

Answer: _____

- 6** Big Ideas Method: PEMDAS Step-by-Step
Evaluate $120 - 4 \times (3 + 2)^2$.

Work:

Answer: _____

- 7** Big Ideas Method: PEMDAS Step-by-Step
Fraction Bar Grouping: Evaluate $(24 + 12) \div (9 - 3)$.

Work:

Answer: _____

- 8** Big Ideas Method: PEMDAS Step-by-Step
Evaluate $3^2 + 15 \div 3 - 2 \times 4$.

Work:

Answer: _____

- 9** Application & 2-Way Check: Multi-Step Expression
Evaluate $10 + (15 - 3)^2 \div 9$ using PEMDAS step-by-step AND check on your SC-6.

Work:

Answer: _____

- 10** Application & 2-Way Check: Multi-Step Expression
Movie tickets: 2 adults at \$12 each and 4 kids at \$8 each, minus a \$10 coupon.
Write an expression and find total cost.

Work:

Answer: _____

Section 1.4: Prime Factorization — Factor Trees & Logarithmic Prime Towers

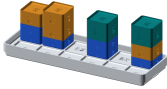
Big Ideas Method: Factor Trees, Prime vs. Composite Testing & Prime-Power Factorization

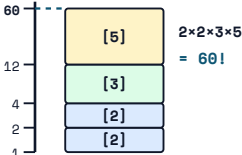
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CONCEPT SUMMARY & TEXTBOOK CONNECTION:

In Big Ideas Math, a Factor Tree splits a composite number until every branch ends at a prime number. In the Prime Factor Studio (PRIME-01), block heights are logarithmic ($h = 7 \cdot \log_2(p)$ mm), so $[2]+[2]+[3]+[5]$ always reaches the exact 60 mark whether you split 60 as 6×10 or 4×15 !

BLOCK KIT & STEP-BY-STEP GUIDE (PRIME-01: PRIME FACTOR STUDIO)





HOW TO BUILD IT WITH PRIME-01 (PRIME FACTOR STUDIO):

Step 1: Open Kit PRIME-01 (Prime Factor Studio) and set the logarithmic slide-rule scale on the box wall.
Step 2: Select the prime blocks that multiply to 60: two blue [2] blocks, one green [3] block, and one gold [5] block.
Step 3: Stack $[2] + [2] + [3] + [5]$ in any order—the tower height always aligns with 60 on the logarithmic scale!

WORKED EXAMPLE — EXAMPLE 1: FACTOR TREE & PRIME TOWER FOR 60

Problem: Write the prime factorization of 60 using a factor tree, Prime Blocks, and [g] [FACT].

Big Ideas Textbook Method (Factor Trees, Prime vs. Composite Testing & Prime-Power Factorization):
1. Branch 60 into any factor pair (such as 6×10 or 4×15) on a Factor Tree.
2. Continue splitting composite branches until only prime leaves remain: $6 = 2 \times 3$ and $10 = 2 \times 5$.
3. Group identical prime factors using exponents from least to greatest: $60 = 2^2 \times 3 \times 5$.

Block Connection (PRIME-01): Stack two [2] blocks, one [3] block, and one [5] block on the lid—their combined height aligns with 60 on the box wall!

SC-6 Keystrokes:

60

g

FACT

Answer: $60 = 2^2 \times 3 \times 5$

[PRIME] tests primality; [g] [FACT] ([g][PRIME]) show..

SECTION 1.4 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Factor Trees, Prime vs. Composite Testing & Prime-Power Factorization

1

Big Ideas Method: Factor Tree Branches

Draw a factor tree or stack $[2] + [2] + [3]$. Write the prime factorization of 12.

Work: _____

Answer: _____

2

Big Ideas Method: Factor Tree Branches

Find the prime factorization of 36 using blocks and [g] [FACT].

Work: _____

Answer: _____

3

Big Ideas Method: Factor Tree Branches

Test 29 and 57 with [PRIME]. Which one is prime and which is composite?

Work: _____

Answer: _____

4

Big Ideas Method: Factor Tree Branches

Find the prime factorization of 45.

Work: _____

Answer: _____

5

Big Ideas Method: Prime-Power Form

Build the Prime Tower for 72. Show how 8×9 and 6×12 use the exact same blocks.

Work: _____

Answer: _____

6

Big Ideas Method: Prime-Power Form

Find the prime factorization of 84.

Work: _____

Answer: _____

7

Big Ideas Method: Prime-Power Form

Find the prime factorization of 100.

Work: _____

Answer: _____

8

Big Ideas Method: Prime-Power Form

What number has the prime tower $[2] + [2] + [3] + [7]$ ($2^2 \times 3 \times 7$)?

Work: _____

Answer: _____

9

Application & 2-Way Check: Prime Factorization Check

Find the prime factorization of 180 both by splitting 18×10 AND with [g] [FACT].

Work: _____

Answer: _____

10

Application & 2-Way Check: Prime Factorization Check

Mystery Vault Code: A 3-digit number equals $2^3 \times 3^2 \times 5$. Find the number and verify with [g] [FACT].

Work: _____

Answer: _____

StackCalc SC-6 Textbook Supplement • Unit 1: Numerical Expressions & Factors — Section 1.4 (Big Ideas Grade 6, Section 1.4 (Prime Factoriz..

Page 5 of 46

Section 1.5: Greatest Common Factor (GCF) & Least Common Multiple (LCM)

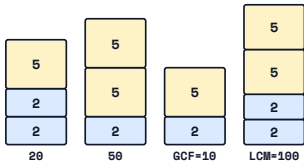
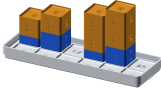
Big Ideas Method: Venn Diagram of Prime Factors — Shared Overlap for GCF & Tallest Prime Powers for LCM

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CONCEPT SUMMARY & TEXTBOOK CONNECTION:

When you stand two Prime Factor Towers next to each other on the 12-socket lid, you see GCF and LCM at the same time: GCF is the shared blocks both towers have in common (overlap), and LCM is the tallest tower needed to cover both (union)! Verify in 1 click with [GCF] and [f] [LCM].

BLOCK KIT & STEP-BY-STEP GUIDE (PRIME-01: PRIME FACTOR STUDIO)



HOW TO BUILD IT WITH PRIME-01 (PRIME FACTOR STUDIO):

Step 1: Open Kit PRIME-01 (Prime Factor Studio) and build Tower 20 ([2][2][5]) and Tower 50 ([2][5][5]) side by side.

Step 2: For GCF, pull out the prime blocks shared by BOTH towers: one [2] and one [5] -> [2][5] = 10.

Step 3: For LCM, build the tallest union covering both towers: two [2]s and two [5]s -> [2][2][5][5] = 100.

WORKED EXAMPLE — EXAMPLE 1: SIMULTANEOUS GCF & LCM OF 20 AND 50

Problem: Find both the GCF and LCM of 20 and 50 using Prime Towers and the SC-6.

Big Ideas Textbook Method (Venn Diagram of Prime Factors — Shared Overlap for GCF & Tallest Prim..

- Write the prime factorization of each number: $20 = 2^2 \times 5$ and $50 = 2 \times 5^2$.
- GCF (Shared Factors): Multiply the common prime factors with lesser exponents: $2^1 \times 5^1 = 10$.
- LCM (All Factors): Multiply all prime factors using the greatest exponent of each: $2^2 \times 5^2 = 4 \times 25 = 100$.

Block Connection (PRIME-01): Tower 20 is [2][2][5] and Tower 50 is [2][5][5]. Both share [2][5] = 10 (GCF). Taking the max of each color gives [2][2][5][5] = 100 (LCM)!

SC-6 Keystrokes: 20 ENTER 50 GCF 20 ENTER 50 f LCM

Answer: GCF = 10, LCM = 100 Check: $GCF \times LCM = 10 \times 100 = 1,000$, matching 20..

SECTION 1.5 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER Method Focus: Venn Diagram of Prime Factors — Shared Overlap for GCF & Talles..

1 Big Ideas Method: Prime Factor GCF & LCM

Find the GCF and LCM of 12 and 18 using Prime Towers and [GCF] / [f] [LCM].

Work: _____

Answer: _____

2 Big Ideas Method: Prime Factor GCF & LCM

Find the GCF and LCM of 8 and 12.

Work: _____

Answer: _____

3 Big Ideas Method: Prime Factor GCF & LCM

Find the GCF and LCM of 15 and 25.

Work: _____

Answer: _____

4 Big Ideas Method: Prime Factor GCF & LCM

Find the GCF and LCM of 14 and 35.

Work: _____

Answer: _____

5 Big Ideas Method: Shared Factors vs. Multiples

Find the GCF and LCM of 16 and 24.

Work: _____

Answer: _____

6 Big Ideas Method: Shared Factors vs. Multiples

Find the GCF and LCM of 28 and 42.

Work: _____

Answer: _____

7 Big Ideas Method: Shared Factors vs. Multiples

Two prime numbers are 5 and 7. What is their GCF and what is their LCM?

Work: _____

Answer: _____

8 Big Ideas Method: Shared Factors vs. Multiples

Verify that $GCF(15, 20) \times LCM(15, 20)$ equals 15×20 .

Work: _____

Answer: _____

9 Application & 2-Way Check: GCF & LCM Word Problem

Hot dogs come in packs of 12 and buns in packs of 15. What is the smallest number of each to buy with 0 leftovers?

Work: _____

Answer: _____

10 Application & 2-Way Check: GCF & LCM Word Problem

You have 36 red tiles and 48 blue tiles to pack into identical kit bags with none left over. What is the max number of bags?

Work: _____

Answer: _____

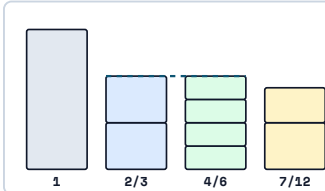
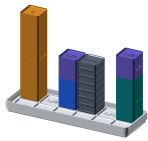
Section 2.1: Equivalent Fractions, Mixed Numbers & Adding Towers

Big Ideas Method: Equivalent Fractions via GCF Simplification & Adding/Subtracting with Least Common Denominator..

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

In the Fraction Studio (FRAC-01), 1 Whole is exactly 84.0 mm tall. Whenever two fraction towers stand at the exact same millimeter height, they are equivalent! Use [.] to enter fractions (e.g., [.] 4 [.] 6), [g] [SIMP] to simplify step-by-step, [f] [d/c] for improper fractions, and [FDISP] to toggle decimal view!

BLOCK KIT & STEP-BY-STEP GUIDE (FRAC-01: 84MM FRACTION STUDIO)**HOW TO BUILD IT WITH FRAC-01 (84MM FRACTION STUDIO):**

- Step 1:** Open Kit FRAC-01 (84mm Fraction Studio) and place the 84mm Whole (1) datum block on the comparator lid.
- Step 2:** Stack four 1/6 blocks ($4 \times 14\text{mm} = 56\text{mm}$) next to two 1/3 blocks ($2 \times 28\text{mm} = 56\text{mm}$) to see $12/18 = 6/9 = 2/3$.
- Step 3:** To add $1/3 + 1/4$, stack one 1/3 block (28mm) and one 1/4 block (21mm) = 49mm, matching seven 1/12 blocks (7/12).

WORKED EXAMPLE – EXAMPLE 1: STEP-BY-STEP SIMPLIFICATION WITH [g] [SIMP]

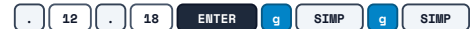
Problem: Simplify 12/18 step-by-step and compare tower heights.

Big Ideas Textbook Method (Equivalent Fractions via GCF Simplification & Adding/Subtracting with Le..

1. Divide numerator and denominator of 12/18 by common factors: $(12 \div 2)/(18 \div 2) = 6/9$, then $(6 \div 3)/(9 \div 3) = 2/3$.
2. To add unlike fractions ($1/3 + 1/4$), find the LCD of 3 and 4, which is 12.
3. Rewrite as equivalent twelfths and add numerators: $4/12 + 3/12 = 7/12$.

Block Connection (FRAC-01): Four 1/6 blocks ($4 \times 14\text{mm} = 56\text{mm}$) stand at the exact same height as two 1/3 blocks ($2 \times 28\text{mm} = 56\text{mm}$).

SC-6 Keystrokes:



Answer: 12/18 -> 6/9 -> 2/3

Each press of [g] [SIMP] ([g][a b/c]) divides out one c..

SECTION 2.1 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Equivalent Fractions via GCF Simplification & Adding/Subtractin..

- 1** Big Ideas Method: Simplest Form / Mixed-Improper
Simplify 8/12 using [g] [SIMP]. What intermediate fraction appears first?

Work:

Answer: _____

- 2** Big Ideas Method: Simplest Form / Mixed-Improper
Simplify 24/36 completely and check its decimal with [FDISP].

Work:

Answer: _____

- 3** Big Ideas Method: Simplest Form / Mixed-Improper
Convert 2 3/5 into an improper fraction ([f] [d/c]) and a decimal ([FDISP]).

Work:

Answer: _____

- 4** Big Ideas Method: Simplest Form / Mixed-Improper
Convert 19/8 into a mixed number ([a b/c]) and a decimal ([FDISP]).

Work:

Answer: _____

- 5** Big Ideas Method: LCD Addition & Subtraction
Add $1/2 + 1/3$ using a common denominator (sixths) and check with 84mm Fraction Blocks.

Work:

Answer: _____

- 6** Big Ideas Method: LCD Addition & Subtraction
Add $3/4 + 5/6$ using the LCD (12). Write both the mixed number and improper fraction.

Work:

Answer: _____

- 7** Big Ideas Method: LCD Addition & Subtraction
Subtract $7/8 - 1/4$ and verify with [f] [LASTX] [+].

Work:

Answer: _____

- 8** Big Ideas Method: LCD Addition & Subtraction
Subtract mixed numbers: $4 \frac{1}{3} - 1 \frac{5}{6}$.

Work:

Answer: _____

- 9** Application & 2-Way Check: Mixed Number Regrouping
Build $1/3 + 1/4$ with 84mm towers (28mm + 21mm) AND solve using the LCD (twelfths).

Work:

Answer: _____

- 10** Application & 2-Way Check: Mixed Number Regrouping
A trail is $3 \frac{3}{4}$ miles long. You hiked $1 \frac{7}{8}$ miles. How much trail is left? Solve 2 ways!

Work:

Answer: _____

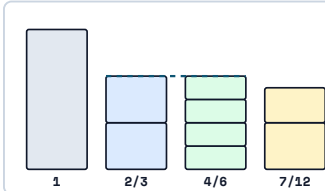
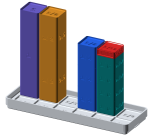
Section 2.2: Multiplying Fractions & Mixed Numbers

Big Ideas Method: Area/Tower Model for Fraction $\times$ Fraction & Cross-Canceling Common Factors

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Why does multiplying two proper fractions make a SMALLER answer? Because ' $\times$ ' means 'OF!' Taking $\frac{1}{2}$ OF a $\frac{3}{4}$ tower (63 mm) gives half its height (31.5 mm = $\frac{3}{8}$). For mixed numbers, rewrite as improper fractions first (or use [f] [d/c]) and simplify common factors before multiplying!

BLOCK KIT & STEP-BY-STEP GUIDE (FRAC-01: 84MM FRACTION STUDIO)**HOW TO BUILD IT WITH FRAC-01 (84MM FRACTION STUDIO):**

Step 1: Open Kit FRAC-01 (84mm Fraction Studio) and stand three $\frac{1}{4}$ blocks to build a $\frac{3}{4}$ tower (63.0 mm tall).

Step 2: To find $\frac{1}{2}$ OF $\frac{3}{4}$, measure half the height of the 63.0 mm tower: $63.0 \text{ mm} \div 2 = 31.5 \text{ mm}$.

Step 3: Place three $\frac{1}{8}$ blocks ($3 \times 10.5 \text{ mm} = 31.5 \text{ mm}$) alongside to prove $\frac{1}{2} \times \frac{3}{4} = \frac{3}{8}$.

WORKED EXAMPLE – EXAMPLE 1: FRACTION OF A FRACTION ($\frac{1}{2} \times \frac{3}{4}$)

Problem: Find $\frac{1}{2} \times \frac{3}{4}$ using 84mm Fraction Towers and the SC-6.

Big Ideas Textbook Method (Area/Tower Model for Fraction $\times$ Fraction & Cross-Canceling Common Factors):

1. Multiply the numerators and multiply the denominators: $(1 \times 3) / (2 \times 4) = \frac{3}{8}$.
2. For mixed numbers ($1 \frac{1}{2} \times 2 \frac{2}{3}$), convert to improper fractions first: $\frac{3}{2} \times \frac{8}{3}$.
3. Divide out common factors on the diagonal (cancel the 3s and divide 8 by 2) to get 4.

Block Connection (FRAC-01): Stand three $\frac{1}{4}$ blocks (63 mm). Half of 63 mm is 31.5 mm, which matches three $\frac{1}{8}$ blocks ($3 \times 10.5 \text{ mm} = 31.5$)!

SC-6 Keystrokes:



Answer: $\frac{3}{8}$

Check with [f] [LASTX] [=] -> restores $\frac{1}{2}$ immediately!

SECTION 2.2 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWERMethod Focus: Area/Tower Model for Fraction $\times$ Fraction & Cross-Canceling Comm.

- 1** Big Ideas Method: Numerator $\times$ Numerator / Cross-Cancel
Find $\frac{1}{2} \times \frac{2}{3}$. (Hold two $\frac{1}{3}$ blocks and take half of them!)

Work:

Answer: _____

- 2** Big Ideas Method: Numerator $\times$ Numerator / Cross-Cancel
Find $\frac{2}{3} \times \frac{3}{4}$ and check with [f] [LASTX] [=].

Work:

Answer: _____

- 3** Big Ideas Method: Numerator $\times$ Numerator / Cross-Cancel
Multiply $\frac{3}{5} \times \frac{5}{9}$.

Work:

Answer: _____

- 4** Big Ideas Method: Numerator $\times$ Numerator / Cross-Cancel
Multiply a whole number by a fraction: $12 \times \frac{3}{4}$.

Work:

Answer: _____

- 5** Big Ideas Method: Improper Fraction Conversion
Multiply mixed numbers: $1 \frac{3}{4} \times 2 \frac{2}{7}$.

Work:

Answer: _____

- 6** Big Ideas Method: Improper Fraction Conversion
Multiply $2 \frac{1}{4} \times 1 \frac{1}{3}$.

Work:

Answer: _____

- 7** Big Ideas Method: Improper Fraction Conversion
Multiply $3 \frac{1}{2} \times 2 \frac{1}{2}$. Write the answer as a mixed number and decimal.

Work:

Answer: _____

- 8** Big Ideas Method: Improper Fraction Conversion
Prediction Check: Without calculating, is $5 \times \frac{2}{3}$ greater than 5 or less than 5? Now compute it!

Work:

Answer: _____

- 9** Application & 2-Way Check: Scaling & Multi-Step Product
A slime recipe uses $1 \frac{3}{4}$ cups of glue per batch. How much glue is needed for $2 \frac{1}{2}$ batches?

Work:

Answer: _____

- 10** Application & 2-Way Check: Scaling & Multi-Step Product
Triple Chain: Evaluate $\frac{4}{5} \times \frac{5}{6} \times \frac{3}{4}$ both by cross-canceling common factors AND on your SC-6!

Work:

Answer: _____

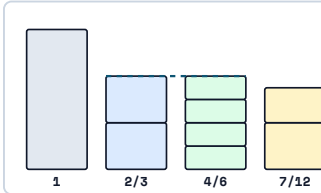
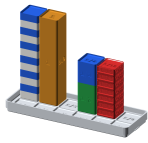
Section 2.3: Dividing Fractions & Mixed Numbers — Why Reciprocal Flip Works

Big Ideas Method: Measurement Division ('How Many Fit?') & Multiplying by the Reciprocal (Keep-Change-Flip)

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Kids memorize 'Keep-Change-Flip' and then forget which fraction to flip! Physically, $3/4 \div 1/8$ asks how many $1/8$ blocks fit alongside a $3/4$ tower (6 fit!). In Big Ideas Math, dividing by a fraction equals multiplying by its reciprocal—and [f] [1/x] flips ONLY the divisor into its reciprocal before you press [=].

BLOCK KIT & STEP-BY-STEP GUIDE (FRAC-01: 84MM FRACTION STUDIO)**HOW TO BUILD IT WITH FRAC-01 (84MM FRACTION STUDIO):**

- Step 1:** Open Kit FRAC-01 (84mm Fraction Studio) and build a $3/4$ dividend tower (three 21mm blocks = 63.0 mm).
- Step 2:** Stack $1/8$ divisor blocks (10.5 mm each) right beside the $3/4$ tower until the heights match.
- Step 3:** Count the $1/8$ blocks: every $1/4$ block matches two $1/8$ blocks, so $3 \times 2 = 6$ blocks fit ($3/4 \div 1/8 = 6$).

WORKED EXAMPLE — EXAMPLE 1: PHYSICAL TOWER FIT VS. [F] [1/X] RECIPROCAL FLIP

Problem: Divide $3/4 \div 1/8$ by comparing tower heights and by multiplying by the reciprocal with [f] [1/x].

Big Ideas Textbook Method (Measurement Division ('How Many Fit?') & Multiplying by the Reciprocal (..

1. Write the division problem: $3/4 \div 1/8$.
2. Find the reciprocal of the divisor (flip $1/8$ to $8/1$) and rewrite division as multiplication: $3/4 \times 8/1$.
3. Simplify common factors ($8 \div 4 = 2$) and multiply: $3 \times 2 = 6$.

Block Connection (FRAC-01): One $1/4$ block (21mm) holds two $1/8$ blocks (10.5mm). So three $1/4$ blocks hold $3 \times 2 = 6$ eighths!

SC-6 Keystrokes:**Answer:** 6[f] [1/x] ([f][FDISP]) flips $1/8$ into its reciprocal $8/1$, the..**SECTION 2.3 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER**

Method Focus: Measurement Division ('How Many Fit?') & Multiplying by the Rec..

- 1** Big Ideas Method: Multiply by Reciprocal
How many $1/4$ blocks fit in a $1/2$ tower? Compute $1/2 \div 1/4$.

Work:

Answer: _____

- 2** Big Ideas Method: Multiply by Reciprocal
How many $1/6$ blocks (14mm) fit in a $2/3$ tower (56mm)? Compute $2/3 \div 1/6$.

Work:

Answer: _____

- 3** Big Ideas Method: Multiply by Reciprocal
Divide $5/6 \div 5/12$ by multiplying by the reciprocal ([f] [1/x] [=]).

Work:

Answer: _____

- 4** Big Ideas Method: Multiply by Reciprocal
Divide a whole number by a fraction: $6 \div 3/4$.

Work:

Answer: _____

- 5** Big Ideas Method: Mixed-Number Reciprocal Division
Divide $3/4 \div 2/5$. Write the answer as a mixed number.

Work:

Answer: _____

- 6** Big Ideas Method: Mixed-Number Reciprocal Division
Divide a fraction by a whole number: $4/5 \div 2$.

Work:

Answer: _____

- 7** Big Ideas Method: Mixed-Number Reciprocal Division
Divide mixed numbers: $4 \frac{1}{2} \div 3/4$.

Work:

Answer: _____

- 8** Big Ideas Method: Mixed-Number Reciprocal Division
Divide $5 \frac{1}{4} \div 1 \frac{3}{4}$ and prove with [f] [LASTX] [=].

Work:

Answer: _____

- 9** Application & 2-Way Check: Equal-Size Measurement Cuts
A board is $6 \frac{3}{4}$ ft long. You cut it into $3/4$ -ft shelves. How many shelves can you cut? Solve 2 ways!

Work:

Answer: _____

- 10** Application & 2-Way Check: Equal-Size Measurement Cuts
A $3 \frac{3}{4}$ -cup pitcher of smoothie is poured into $5/8$ -cup glasses. How many glasses does it fill?

Work:

Answer: _____

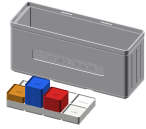
Section 2.4: Adding, Subtracting & Multiplying Decimals

Big Ideas Method: Vertical Decimal Point Alignment (+/-) & Counting Decimal Places / Estimation (×)

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Paper decimal errors happen when place-value columns drift or decimal places are miscounted in multiplication. Use the Place Value Studio (PLACE-01) and the [f] [IP] (Integer Part) and [g] [FP] (Fractional Part) keys to align Tenths and Hundredths and estimate whole-number products first!

BLOCK KIT & STEP-BY-STEP GUIDE (PLACE-01: PLACE VALUE STUDIO)

Input: 14.85

[f] [IP]

14

Whole

[g] [FP]

0.85

Decimal

HOW TO BUILD IT WITH PLACE-01 (PLACE VALUE STUDIO):

- Step 1:** Open Kit PLACE-01 (Place Value Studio) and separate 14.85 into Whole Tens/Ones (14) and Tenths/Hundredths (0.85).
- Step 2:** To add $14.60 + 3.85$, place 6 tenths + 8 tenths (regroup 10 tenths $\rightarrow$ 1 one + 4 tenths) and 5 hundredths.
- Step 3:** Combine the whole ones ($14 + 3 + 1 = 18$) with the decimal part (0.45) to read 18.45.

WORKED EXAMPLE – EXAMPLE 1: ALIGNING DECIMAL PLACE VALUES ([f] [IP] & [g] [FP])**Problem:** Split 14.85 into its whole and decimal parts, then compute $14.60 + 3.85$.**Big Ideas Textbook Method (Vertical Decimal Point Alignment (+/-) & Counting Decimal Places / Estima..**

- Line up the decimal points vertically and annex a trailing zero so both numbers have hundredths: $14.60 + 3.85$.
- Add column by column from right to left (hundredths, tenths, ones, tens): $14.60 + 3.85 = 18.45$.
- Check by subtracting $18.45 - 3.85 = 14.60$.

Block Connection (PLACE-01): On the Place Value tray, 14 sits in the Tens/Ones bays ([f] [IP] $\rightarrow$ 14) and .85 sits in Tenths/Hundredths ([g] [FP] $\rightarrow$ 0.85).

SC-6 Keystrokes:

14.6

ENTER

3.85

+

f

LASTX

-

Answer: 18.45 (Checked: $18.45 - 3.85 = 14.60$. [f] [IP] ([f][PV]) shows whole part; [g] [FP] ([g][PV]) sh..**SECTION 2.4 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWER**

Method Focus: Vertical Decimal Point Alignment (+/-) & Counting Decimal Place..

1 Big Ideas Method: Vertical Decimal Alignment

Enter 27.64. Use [f] [IP] and [g] [FP] to write its Whole part and Decimal part.

Work:

Answer: _____

2 Big Ideas Method: Vertical Decimal AlignmentLine up the decimal points to add $12.8 + 4.75$, and check with [f] [LASTX] [-].

Work:

Answer: _____

3 Big Ideas Method: Vertical Decimal AlignmentAnnex zeros to subtract $20.00 - 8.65$.

Work:

Answer: _____

4 Big Ideas Method: Vertical Decimal AlignmentMultiply 4.5×0.6 .

Work:

Answer: _____

5 Big Ideas Method: Decimal Place Count & EstimateEvaluate $25.4 - 9.86 + 3.2$.

Work:

Answer: _____

6 Big Ideas Method: Decimal Place Count & EstimateMultiply 3.6×2.25 and check the whole-number ballpark.

Work:

Answer: _____

7 Big Ideas Method: Decimal Place Count & EstimateMultiply 0.15×0.4 and tap [FDISP] to see its simplified fraction.

Work:

Answer: _____

8 Big Ideas Method: Decimal Place Count & Estimate

Find the area of a rectangular desk top measuring 1.8 m by 0.75 m.

Work:

Answer: _____

9 Application & 2-Way Check: Multi-Step Money & Area

You pay with a \$20 bill for a \$8.75 burger and \$4.60 smoothie. How much change do you get?

Work:

Answer: _____

10 Application & 2-Way Check: Multi-Step Money & AreaMultiply 4.75×1.2 both as decimals AND as fractions ($4 \frac{3}{4} \times 1 \frac{1}{5}$) using [FDISP]!

Work:

Answer: _____

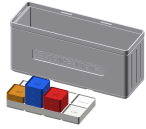
Section 2.5: Dividing Decimals & The 3-Way Fraction-Decimal-Remainder Translator

Big Ideas Method: Power-of-10 Divisor Shift & 3-Way Translation (Decimal <-> Mixed Number <-> Quotient + Remainder)

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Why are $15 \div 4 = 3 \text{ R } 3$, $3 \frac{3}{4}$, and 3.75 all the same answer? Because 3 leftover pieces divided by 4 is $\frac{3}{4} = 0.75$! On the SC-6, tapping [FDISP] after any division cycles through Decimal, Mixed Fraction, Improper Fraction, and Quotient+Remainder with one thumb!

BLOCK KIT & STEP-BY-STEP GUIDE (FRAC-01: FRACTION & PLACE VALUE STUDIO)Input: $15 \div 4$

[f] [IP]

3 R 3

Whole

[g] [FP]

 $3.75 = 3 \frac{3}{4}$

Decimal

HOW TO BUILD IT WITH FRAC-01 (FRACTION & PLACE VALUE STUDIO):

Step 1: Open Kit FRAC-01 / PLACE-01 and model $23 \div 4$ using 5 whole blocks and 3 fourths ($5 \frac{3}{4} = 23/4$).

Step 2: Trade the 3 leftover fourths into 0.75 (7 tenths + 5 hundredths) to read the exact decimal 5.75.

Step 3: For decimal divisors like $15.6 \div 0.12$, shift both decimals 2 places right ($\times 100$) to divide $1,560 \div 12 = 130$.

WORKED EXAMPLE – EXAMPLE 1: THE 4-OUTFIT [FDISP] TRANSLATOR ($23 \div 4$)

Problem: Write $23 \div 4$ as a decimal, mixed number, improper fraction, and quotient with remainder.

Big Ideas Textbook Method (Power-of-10 Divisor Shift & 3-Way Translation (Decimal <-> Mixed Number..

1. Quotient & Remainder Form: $23 \div 4 = 5 \text{ R } 3$ (5 full groups of 4 with 3 left over).
2. Mixed Number & Improper Fraction Form: Write the remainder over the divisor $\rightarrow 5 \frac{3}{4} = 23/4$.
3. Decimal Form: Divide $3.00 \div 4 = 0.75 \rightarrow 5.75$ (for decimal divisors, multiply both by 10 or 100 first).

Block Connection (FRAC-01): 23 quarter-blocks make 5 whole stacks of 4 (20) plus 3 fourths ($3/4 = 0.75$).

SC-6 Keystrokes:

23

ENTER

4

 $\div$

FDISP

f

d/c

Answer: $5.75 = 5 \frac{3}{4} = 23/4 = 5 \text{ R } 3$ Tap [FDISP] repeatedly to see every textbook format..

SECTION 2.5 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Power-of-10 Divisor Shift & 3-Way Translation (Decimal <-> Mixed Number <-> Quotient + Remainder)

1 Big Ideas Method: 3-Way Form Translation

Write $39 \div 8$ as (a) Quotient + Remainder, (b) Decimal, and (c) Mixed Number.

Work:

Answer: _____

2 Big Ideas Method: 3-Way Form Translation

Divide a decimal by a whole number: $18.4 \div 8$.

Work:

Answer: _____

3 Big Ideas Method: 3-Way Form Translation

How many quarters (\$0.25) are in \$11.25? Compute $11.25 \div 0.25$.

Work:

Answer: _____

4 Big Ideas Method: 3-Way Form Translation

Divide $7.2 \div 0.9$ and check with [f] [LASTX] [$\times$].

Work:

Answer: _____

5 Big Ideas Method: Power-of-10 Divisor Shift

Divide $15.6 \div 0.12$.

Work:

Answer: _____

6 Big Ideas Method: Power-of-10 Divisor Shift

Divide $9.45 \div 1.5$ and tap [FDISP] to write its mixed fraction form.

Work:

Answer: _____

7 Big Ideas Method: Power-of-10 Divisor Shift

Divide $0.84 \div 0.07$.

Work:

Answer: _____

8 Big Ideas Method: Power-of-10 Divisor Shift

Spot the Glitch: Leo says $4.8 \div 0.2 = 0.24$. Use [f] [LASTX] or estimation to fix it!

Work:

Answer: _____

9 Application & 2-Way Check: Decimal Division Application

A runner completes a 4.5-mile race in 0.75-mile laps. How many laps is the race? Solve 2 ways!

Work:

Answer: _____

10 Application & 2-Way Check: Decimal Division Application

A 6-pack of sports drinks costs \$7.50. What is the cost of 1 bottle, and how many bottles can \$20 buy?

Work:

Answer: _____

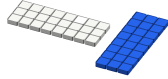
Section 3.1: Ratios & Tape Diagrams — Part-to-Part vs. Part-to-Whole

Big Ideas Method: Part-to-Part vs. Part-to-Whole Tape Diagrams & GCF Ratio Simplification

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Instead of drawing uneven paper boxes for a Tape Diagram, snap Blue and Gold Counting Tiles onto your desk! Each tile is 1 equal unit box. For a 3:2 ratio, 3 Blue + 2 Gold = 5 total tiles (Part-to-Whole = 3/5). Use [g] [a:b] ([g](GCF)) to reduce any ratio to simplest form!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)

Part A (3 tiles):



Part B (2 tiles):



Ratio 3:2 (5 boxes total)

HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):

Step 1: Open Kit COUNT-01 (Counting & Array Tiles) and place 3 blue tiles (Row A) above 2 gold tiles (Row B) for 3:2.

Step 2: To model 18 builders and 12 speedrunners, group by GCF(18, 12) = 6 per tile -> 3 blue tiles : 2 gold tiles.

Step 3: Count all 3 + 2 = 5 tiles to read the Part-to-Whole ratio: 3:5 (18 out of 30 total).

WORKED EXAMPLE — EXAMPLE 1: SIMPLIFYING RATIOS WITH [G] [A:B]

Problem: A gaming clan has 18 builders and 12 speedrunners. Simplify the Part-to-Part and Part-to-Whole ratios.

Big Ideas Textbook Method (Part-to-Part vs. Part-to-Whole Tape Diagrams & GCF Ratio Simplification):

1. Part-to-Part Ratio: Compare 18 builders to 12 speedrunners -> 18:12. Divide both by GCF(18, 12) = 6 -> 3:2.
2. Total (Whole): Add the parts: 18 + 12 = 30 total members.
3. Part-to-Whole Ratio: Compare 18 builders to 30 total -> 18:30, which simplifies by GCF = 6 to 3:5.

Block Connection (COUNT-01): Group 18 and 12 by their GCF (6): you get 3 builders for every 2 speedrunners (and 3 + 2 = 5 players per group).

SC-6 Keystrokes:

18

ENTER

12

g

a:b

Answer: Part-to-Part = 3:2; Part-to-Whole = 3:5. [g] [a:b] divides both Y and X by their GCF in 1 click!

SECTION 3.1 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Part-to-Part vs. Part-to-Whole Tape Diagrams & GCF Ratio Simplification

- 1** Big Ideas Method: Part-to-Part & Part-to-Whole
Simplify the ratio 12 : 18 using [g] [a:b].

Work:

Answer: _____

- 2** Big Ideas Method: Part-to-Part & Part-to-Whole
Simplify the ratio 24 : 16 using [g] [a:b].

Work:

Answer: _____

- 3** Big Ideas Method: Part-to-Part & Part-to-Whole
A bag has 4 red marbles and 6 blue marbles. Find the simplified ratio of red to TOTAL marbles.

Work:

Answer: _____

- 4** Big Ideas Method: Part-to-Part & Part-to-Whole
In a 3:4 tape diagram, each tile is worth 6. Find the two parts and the total.

Work:

Answer: _____

- 5** Big Ideas Method: Tape Diagram Box Value
Green paint mixes blue and yellow in a 2:3 ratio. If you use 25 cups total, how many cups of each?

Work:

Answer: _____

- 6** Big Ideas Method: Tape Diagram Box Value
The ratio of cats to dogs at a shelter is 4:5. There are 36 animals total. How many are dogs?

Work:

Answer: _____

- 7** Big Ideas Method: Tape Diagram Box Value
The ratio of boys to girls in a club is 3:5. If there are 15 boys, how many girls are there?

Work:

Answer: _____

- 8** Big Ideas Method: Tape Diagram Box Value
Difference Tape Model: The ratio of acoustic to electric guitars is 2:5. There are 18 MORE electric guitars. Find how many electric guitars!

Work:

Answer: _____

- 9** Application & 2-Way Check: Total-Share Tape Problem
Two robot teams split 84 gears in a 4:3 ratio. How many gears does each team get? Solve 2 ways!

Work:

Answer: _____

- 10** Application & 2-Way Check: Total-Share Tape Problem
Ratio of gold to silver coins is 7:4. There are 21 more gold coins than silver. How many coins in all?

Work:

Answer: _____

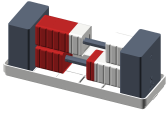
Section 3.2: Ratio Tables & Double Number Lines via [g] [REP]

Big Ideas Method: Equivalent Ratio Tables & Double Number Lines via Repeated Addition or Scale Factors

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

A Ratio Table and a Double Number Line are the exact same thing: two skip-counting ladders running side-by-side! Press 3 [g] [REP] and tap [+] to march across the top row (3, 6, 9, 12, 15), then 7 [g] [REP] and tap [+] to march across the bottom row (7, 14, 21, 28, 35)!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)

Part A (3 tiles):



Part B (5 tiles):



Ratio 3:5 (8 boxes total)

HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):

Step 1: Open Kit COUNT-01 (Counting & Array Tiles) and lay down Step 1 of the ratio table: 8 distance tiles and 3 time tiles.

Step 2: Add identical groups of (8 m, 3 s) to build the Double Number Line: (8, 3), (16, 6), (24, 9), (32, 12), (40, 15).

Step 3: Notice that 5 jumps of 3 seconds reach 15 seconds, and 5 jumps of 8 meters reach 40 meters!

WORKED EXAMPLE – EXAMPLE 1: GENERATING A RATIO TABLE WITH [g] [REP]

Problem: A drone flies 8 meters every 3 seconds. Build a 5-step table to find how far it flies in 15 seconds.

Big Ideas Textbook Method (Equivalent Ratio Tables & Double Number Lines via Repeated Addition or..

1. Set up a Ratio Table (or Double Number Line) starting with Distance = 8 m and Time = 3 s.
2. Find the scale factor from 3 seconds to 15 seconds: $15 \div 3 = 5$ (5 equal steps).
3. Multiply the distance by the same scale factor: $8 \text{ m} \times 5 = 40 \text{ meters}$.

Block Connection (COUNT-01): Seconds ladder: 3 [g] [REP] [+] [+] [+] -> 3, 6, 9, 12, 15 (5 jumps). Meters ladder: 8 [g] [REP] [+] [+] [+] -> 8, 16, 24, 32, 40!

SC-6 Keystrokes:

**Answer: 40 meters in 15 seconds***[g] [REP] ([g][x→y]) locks the step size so each [+] ad..***SECTION 3.2 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWER**

Method Focus: Equivalent Ratio Tables & Double Number Lines via Repeated Addition or Scale Factors

1 Big Ideas Method: Ratio Table / Double Number Line

Use 4 [g] [REP] and 9 [g] [REP] to write the first 4 equivalent ratios of 4 : 9.

Work:

Answer: _____

2 Big Ideas Method: Ratio Table / Double Number LineIn a ratio table where $A : B = 4 : 9$, find B when $A = 28$.

Work:

Answer: _____

3 Big Ideas Method: Ratio Table / Double Number LineIn a ratio table where $X : Y = 5 : 12$, find X when $Y = 60$.

Work:

Answer: _____

4 Big Ideas Method: Ratio Table / Double Number Line

A printer prints 15 pages every 2 minutes. How many pages in 8 minutes?

Work:

Answer: _____

5 Big Ideas Method: Scale Factor Multiplication

Hot cocoa uses 3 tbsp cocoa for every 8 oz milk. How much milk for 18 tbsp cocoa?

Work:

Answer: _____

6 Big Ideas Method: Scale Factor Multiplication

8 markers cost \$12. Scale down to 2 markers, then scale up to find the cost of 10 markers.

Work:

Answer: _____

7 Big Ideas Method: Scale Factor Multiplication

A heart beats 21 times in 15 seconds. How many beats in 60 seconds (1 minute)?

Work:

Answer: _____

8 Big Ideas Method: Scale Factor Multiplication

Spot the Glitch: For 3:5, Sam added 4 to both sides and wrote 7:9. Test with [g] [a:b]—are they equal?

Work:

Answer: _____

9 Application & 2-Way Check: Multi-Step Ratio Scaling

9 smoothies take 12 cups of berries. How many cups of berries for 15 smoothies? Solve 2 ways!

Work:

Answer: _____

10 Application & 2-Way Check: Multi-Step Ratio Scaling

An e-bike travels 14 miles on 35% battery. How far can it travel on 100% battery?

Work:

Answer: _____

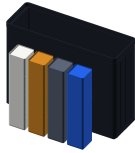
Section 3.3: Unit Rates & Best-Buy Showdowns (Plus [x↔y] Swap Rescue)

Big Ideas Method: Unit Rate Method (Dividing to Find Amount per 1 Unit) & Best-Buy Unit Price Comparison

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

'Dollars PER Ounce' means Dollars ÷ Ounces (enter Dollars on Y, Ounces on X, press [=]). What if you accidentally typed Ounces first and Dollars second? Don't clear! Just press [x↔y] ([f][R][=]) to swap Floor 1 and Floor 2, then press [=]!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)**GROUP 1 TILES:**Bag A: $\$4.20 \div 12 = \$0.35/\text{oz}$ **GROUP 2 TILES:**Bag B: $\$5.12 \div 16 = \$0.32/\text{oz}$

==> Bag B Wins!

HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):

Step 1: Open Kit COUNT-01 (Counting & Array Tiles) and represent 5 minutes with 5 equal 1-minute trays.

Step 2: Divide 315 words equally across the 5 trays: $315 \div 5 = 63$ words per 1-minute tray.

Step 3: To compare two store deals, find the price of 1 single unit (dollars ÷ items) for each deal!

WORKED EXAMPLE – EXAMPLE 1: THE [X↔Y] UPSIDE-DOWN RESCUE

Problem: Find the unit rate in words per minute for 315 words in 5 minutes (even if you typed 5 first!).

Big Ideas Textbook Method (Unit Rate Method (Dividing to Find Amount per 1 Unit) & Best-Buy Unit Pri..

1. Write the rate as a fraction with the 'per' unit in the denominator: 315 words / 5 minutes.

2. Divide both numerator and denominator by 5 to get 1 minute in the denominator: 63 words / 1 minute.

3. Always check units: 'Dollars per ounce' means Dollars ÷ Ounces!

Block Connection (COUNT-01): If you typed 5 [ENTER] 315, tap [x↔y] so Y=315 and X=5, then press [=]!

SC-6 Keystrokes:

5

ENTER

315

x↔y

÷

Answer: 63 words per minute

[x↔y] swaps Floor 1 (X) and Floor 2 (Y) instantly!

SECTION 3.3 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Unit Rate Method (Dividing to Find Amount per 1 Unit) & Best-Bu..

- 1** Big Ideas Method: Unit Rate (Amount per 1)
Find the unit speed in miles per hour: 195 miles in 3 hours.

Work:

Answer: _____

- 2** Big Ideas Method: Unit Rate (Amount per 1)
You typed 4 [ENTER] 36 for \$36 in 4 hours. Press [x↔y] [=] to find the hourly pay!

Work:

Answer: _____

- 3** Big Ideas Method: Unit Rate (Amount per 1)
Find the unit price per pound: \$7.80 for 6 pounds of apples.

Work:

Answer: _____

- 4** Big Ideas Method: Unit Rate (Amount per 1)
A 3D printer uses 90 grams of filament in 6 hours. How many grams per hour?

Work:

Answer: _____

- 5** Big Ideas Method: Unit Rate Scaling
Best Buy: Cereal A is \$4.50 for 15 oz. Cereal B is \$5.04 for 18 oz. Find both unit prices!

Work:

Answer: _____

- 6** Big Ideas Method: Unit Rate Scaling
Best Buy: 6-pack of pens for \$5.10 vs. 10-pack of pens for \$8.20.

Work:

Answer: _____

- 7** Big Ideas Method: Unit Rate Scaling
A train travels 210 miles in 3.5 hours. At this rate, how far does it travel in 5 hours?

Work:

Answer: _____

- 8** Big Ideas Method: Unit Rate Scaling
Pump A fills 45 gallons in 5 min. Pump B fills 64 gallons in 8 min. Which pump is faster?

Work:

Answer: _____

- 9** Application & 2-Way Check: Best-Buy Unit Price Showdown
An extruder pushes 45 mm of filament in 15 seconds. How much in 60 seconds (1 min)? Solve 2 ways!

Work:

Answer: _____

- 10** Application & 2-Way Check: Best-Buy Unit Price Showdown
Car A drives 168 miles on 6 gallons. Car B drives 232 miles on 8 gallons. Which car gets more mpg?

Work:

Answer: _____

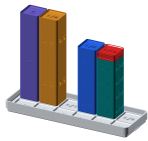
Section 3.4: Percents, Fractions & Decimals — The 3-Costume Switcher

Big Ideas Method: 10×10 Hundredths Grid ('Per 100') & 3-Way Fraction-Decimal-Percent Translation

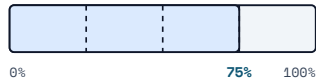
Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

'Per-cent' literally means 'out of 100' (like 100 cents in \$1.00). Instead of memorizing rules for moving decimal points left or right, enter any fraction or decimal on the SC-6 and press [f] [%] ([f][+]) to see its percent, or [FDISP] to switch between fraction and decimal!

BLOCK KIT & STEP-BY-STEP GUIDE (FRAC-01: 84MM FRACTION STUDIO)

$$\frac{3}{4} = 0.75 = 75\%$$

**HOW TO BUILD IT WITH FRAC-01 (84MM FRACTION STUDIO):**

Step 1: Open Kit FRAC-01 (84mm Fraction Studio) and compare the fraction tower to the 100% Whole datum.

Step 2: Scale 7/20 so the denominator is 100 (multiply top and bottom by 5): $7/20 = 35/100$.

Step 3: Read all 3 equivalent forms from 35 hundredths: Fraction = 7/20, Decimal = 0.35, Percent = 35%.

WORKED EXAMPLE — EXAMPLE 1: FRACTION <-> DECIMAL <-> PERCENT IN 1 CLICK

Problem: Convert 7/20 into a decimal and a percent using [FDISP] and [f] [%].

Big Ideas Textbook Method (10×10 Hundredths Grid ('Per 100') & 3-Way Fraction-Decimal-Percent Tran..

1. Fraction to Decimal: Divide numerator by denominator: $7 \div 20 = 0.35$.
2. Decimal to Percent: Multiply by 100 (shift decimal 2 places right): $0.35 = 35\%$.
3. Finding a Percent of a Number (35% of 80): Multiply $0.35 \times 80 = 28$.

Block Connection (FRAC-01): Since $20 \times 5 = 100$, $7/20$ is $35/100 = 0.35 = 35\%$. Verify with [FDISP] and [f] [%].

SC-6 Keystrokes:

[.] [7] [.] [20] [ENTER] [FDISP] [100] [x]

Answer: 0.35 and 35%

To turn any percent p% into a fraction: key p [ENTER]..

SECTION 3.4 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: 10×10 Hundredths Grid ('Per 100') & 3-Way Fraction-Decimal-Perc..

- 1** Big Ideas Method: Fraction <-> Decimal <-> Percent
Write 3/5 as a decimal and as a percent.

Work:

Answer: _____

- 2** Big Ideas Method: Fraction <-> Decimal <-> Percent
Write 9/25 as a decimal and as a percent.

Work:

Answer: _____

- 3** Big Ideas Method: Fraction <-> Decimal <-> Percent
Write 45% as a decimal and as a simplified fraction ([FDISP]).

Work:

Answer: _____

- 4** Big Ideas Method: Fraction <-> Decimal <-> Percent
Write 0.125 as a percent and as a simplified fraction ([FDISP]).

Work:

Answer: _____

- 5** Big Ideas Method: Percent of a Number ($p\% \times \text{Whole}$)
Find 30% of 80 using the [f] [%] key: 80 [ENTER] 30 [f] [%].

Work:

Answer: _____

- 6** Big Ideas Method: Percent of a Number ($p\% \times \text{Whole}$)
Find 15% of 60.

Work:

Answer: _____

- 7** Big Ideas Method: Percent of a Number ($p\% \times \text{Whole}$)
You answered 21 out of 25 questions right. What is your score as a percent?

Work:

Answer: _____

- 8** Big Ideas Method: Percent of a Number ($p\% \times \text{Whole}$)
Convert 150% into a decimal and a mixed fraction.

Work:

Answer: _____

- 9** Application & 2-Way Check: Find the Whole (Part ÷ p%)
Order 5/8, 60%, and 0.61 from least to greatest by converting all 3 to decimals (and percents!).

Work:

Answer: _____

- 10** Application & 2-Way Check: Find the Whole (Part ÷ p%)
A phone battery is at 35% of its 4,000 mAh capacity. How many mAh remain? Solve 2 ways!

Work:

Answer: _____

Section 3.5: Discounts, Percent Change ([g] [%CHG]) & Unit Conversions

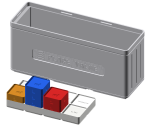
Big Ideas Method: Discounts, Markup/Tax, Percent Change (Change / Original) & Unit Factor Conversions

Name: _____ Date: _____ Score: ____ / 10

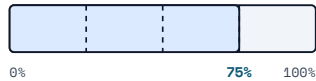
CONCEPT SUMMARY & TEXTBOOK CONNECTION:

On a normal calculator, finding a sale price takes two separate calculations because computing the discount erases the original price! On the SC-6, typing 60 [ENTER] 25 [f] [%] puts the \$15 discount on Floor 1 (X) while keeping \$60 on Floor 2 (Y)—so pressing [-] gives the \$45 sale price in 1 click!

BLOCK KIT & STEP-BY-STEP GUIDE (PLACE-01: PLACE VALUE & FRACTION STUDIO)



$$\frac{3}{4} = 0.75 = 75\%$$



HOW TO BUILD IT WITH PLACE-01 (PLACE VALUE & FRACTION STUDIO):

Step 1: Open Kit PLACE-01 (Place Value Studio) and model \$60 across four 25% quarters (\$15 per quarter).

Step 2: Remove one 25% quarter (\$15 discount) to leave three quarters (75% of \$60 = \$45 sale price).

Step 3: For Percent Change, always divide the Change (New - Old) by the ORIGINAL starting value!

WORKED EXAMPLE — EXAMPLE 1: 2-KEY SALE PRICE ([F] [%] THEN [-])

Problem: A \$60 video game is 25% off. Find the discount and the sale price.

Big Ideas Textbook Method (Discounts, Markup/Tax, Percent Change (Change / Original) & Unit Factor..

1. Discount & Sale Price: Discount = 25% of \$60 = $0.25 \times 60 = \$15$; Sale Price = $\$60 - \$15 = \$45$ (or $0.75 \times \$60 = \$45$).

2. Percent Change: $(\text{New} - \text{Original}) \div \text{Original} \times 100\%$.

3. Unit Conversion: Multiply by the conversion factor that cancels the starting unit.

Block Connection (PLACE-01): 25% is 1/4 of \$60 = \$15 off. The remaining 75% (3/4) is \$45!

SC-6 Keystrokes:

60

ENTER

25

f

%

-

Answer: Discount = \$15; Sale Price = .. For tax or tip, press [+*] instead of [-] at the end!

SECTION 3.5 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Discounts, Markup/Tax, Percent Change (Change / Original) & Uni..

1 Big Ideas Method: Discount, Tax & Tip

An \$80 pair of shoes is 30% off. Find the discount (X) and sale price ([f]).

Work:

Answer: _____

2 Big Ideas Method: Discount, Tax & Tip

A \$40 restaurant meal has a 15% tip. Find the tip and total bill ([+]).

Work:

Answer: _____

3 Big Ideas Method: Discount, Tax & Tip

Find the percent change from 50 to 65 using [g] [%CHG].

Work:

Answer: _____

4 Big Ideas Method: Discount, Tax & Tip

Find the percent change from 80 down to 60 using [g] [%CHG].

Work:

Answer: _____

5 Big Ideas Method: Percent Change & Unit Conversion

Convert 10 inches to centimeters using [f] [->cm] (2.54 cm = 1 in).

Work:

Answer: _____

6 Big Ideas Method: Percent Change & Unit Conversion

Convert 50.8 centimeters back to inches using [g] [->in] ([f][1]).

Work:

Answer: _____

7 Big Ideas Method: Percent Change & Unit Conversion

Convert 11 pounds to kilograms using [f] [->kg] ([f][3]).

Work:

Answer: _____

8 Big Ideas Method: Percent Change & Unit Conversion

Reverse Percent: 18 is 25% of what number? (Divide 18 by 0.25!)

Work:

Answer: _____

9 Application & 2-Way Check: 2-Way Sale Price & Rate Proof

A \$120 skateboard is 20% off. Find the sale price both by subtracting [f][%] AND by multiplying by 80%!

Work:

Answer: _____

10 Application & 2-Way Check: 2-Way Sale Price & Rate Proof

A 32-inch deck weighs 5 lbs. Convert length to cm ([f] [->cm]) and weight to kg ([f] [->kg]). Verify with $\times 2.54$!

Work:

Answer: _____

Section 4.1: Evaluating Algebraic Expressions — Variable Boxes on the Stack

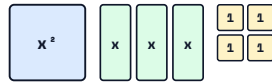
Big Ideas Method: Variable Substitution, Evaluating Algebraic Expressions & Translating Verbal Phrases

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

A letter like x is not scary—it is just an empty green box (ALGB-01) waiting for you to drop a number inside! When you see $4x + 7$ and $x = 5$, replace each x -rod with 5 units ($4 \times 5 = 20$) and add 7 $\rightarrow$ 27. On the SC-6, evaluating an expression is just Section 1.3's elevator math!

BLOCK KIT & STEP-BY-STEP GUIDE (ALGB-01: ALGEBRA BOXES & TILES)



Sort by Shape:

 x^2 -Flats | x -Rods | 1-Cubes

HOW TO BUILD IT WITH ALGB-01 (ALGEBRA BOXES & TILES):

Step 1: Open Kit ALGB-01 (Algebra Boxes & Stage) and place 4 green x -rods and 7 yellow unit cubes on the stage for $4x + 7$.

Step 2: To evaluate at $x = 5$, replace each green x -rod with 5 unit cubes ($4 \text{ groups of } 5 = 20$ unit cubes).

Step 3: Combine the 20 cubes from the x -rods with the 7 constant cubes: $20 + 7 = 27$!

WORKED EXAMPLE — EXAMPLE 1: SINGLE-VARIABLE PLUG-IN ($4x + 7$ WHEN $x = 5$)

Problem: Evaluate $4x + 7$ when $x = 5$ using Algebra Tiles and the SC-6.

Big Ideas Textbook Method (Variable Substitution, Evaluating Algebraic Expressions & Translating Ve..

1. Write the algebraic expression: $4x + 7$.
2. Substitute $x = 5$ in parentheses: $4(5) + 7$.
3. Follow the Order of Operations (multiply before adding): $20 + 7 = 27$.

Block Connection (ALGB-01): Lay out 4 green x -rods and 7 unit cubes. Replace each x -rod with 5 units ($4 \times 5 = 20$), then add 7 units $\rightarrow$ 27!

SC-6 Keystrokes:

**Answer:** 27

Write Snapshot Y: 20 | X: 7 before pressing [+]

SECTION 4.1 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Variable Substitution, Evaluating Algebraic Expressions & Trans..

1 Big Ideas Method: Variable Substitution

Evaluate $6x - 9$ when $x = 7$.

Work:

Answer: _____

2 Big Ideas Method: Variable Substitution

Evaluate $5n + 14$ when $n = 8$.

Work:

Answer: _____

3 Big Ideas Method: Variable Substitution

Evaluate $40 - 3m$ when $m = 9$. (Park 40 on Y first!)

Work:

Answer: _____

4 Big Ideas Method: Variable Substitution

Evaluate $x^2 + 11$ when $x = 6$.

Work:

Answer: _____

5 Big Ideas Method: Two-Variable & Power Evaluation

Evaluate $2y^2 - 5$ when $y = 4$. (Square 4 before multiplying by 2!)

Work:

Answer: _____

6 Big Ideas Method: Two-Variable & Power Evaluation

Evaluate $7a + 3b$ when $a = 4$ and $b = 9$.

Work:

Answer: _____

7 Big Ideas Method: Two-Variable & Power Evaluation

Evaluate $(x + y) \div 4$ when $x = 19$ and $y = 13$.

Work:

Answer: _____

8 Big Ideas Method: Two-Variable & Power Evaluation

Evaluate $5k - 2.4$ when $k = 3.5$.

Work:

Answer: _____

9 Application & 2-Way Check: Translating & Modeling Phrases

Skate park rental costs \$8 flat plus \$4.50 per hour ($8 + 4.50h$). Find the cost for 4 hours 2 ways!

Work:

Answer: _____

10 Application & 2-Way Check: Translating & Modeling Phrases

Surface area of a cube is $6s^2$. Find the surface area when edge $s = 5$ cm.

Work:

Answer: _____

Section 4.2: Combining Like Terms — Why x^2 Flats, x Rods & 1 Cubes Never Mix

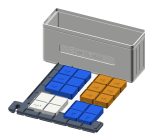
Big Ideas Method: Identifying Terms/Coefficients/Constants & Sorting and Combining Like Terms

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Why can't you add $3x + 2$ and write $5x$? Hold a green x -rod (42 mm long) next to a small yellow 1-cube (14 mm)—they are completely different shapes! 'Combining Like Terms' simply means sorting your tiles into separate piles by shape (x^2 -flats, x -rods, and 1-cubes) and counting each pile!

BLOCK KIT & STEP-BY-STEP GUIDE (ALGB-01: ALGEBRA BOXES & TILES)



Sort by Shape:

 x^2 -Flats | x -Rods | 1-Cubes

HOW TO BUILD IT WITH ALGB-01 (ALGEBRA BOXES & TILES):

Step 1: Open Kit ALGB-01 (Algebra Boxes & Stage) and lay out $4x + 5 + 2x + 3$ using green x -rods and yellow 1-cubes.

Step 2: Sort matching shapes together: group the 4 x -rods and 2 x -rods into 6 x -rods ($6x$), and 5 cubes + 3 cubes into 8 cubes ($+ 8$).

Step 3: Notice that blue x^2 -flats (18×18 mm), green x -rods (18×7 mm), and yellow 1-cubes (7×7 mm) have different dimensions and never mix!

WORKED EXAMPLE — EXAMPLE 1: SORTING x -RODS AND UNIT CUBES ($4x + 5 + 2x + 3$)

Problem: Simplify $4x + 5 + 2x + 3$ and prove it by testing $x = 10$ on your SC-6.

Big Ideas Textbook Method (Identifying Terms/Coefficients/Constants & Sorting and Combining Like T..

1. Use Commutative and Associative Properties to group like terms: $(4x + 2x) + (5 + 3)$.
2. Add the coefficients of the x -terms and add the constants: $(4 + 2)x + 8 = 6x + 8$.
3. Verify by substituting $x = 10$ into both: $4(10) + 5 + 2(10) + 3 = 68$ and $6(10) + 8 = 68$.

Block Connection (ALGB-01): Slide the x -rods together ($4x + 2x = 6x$) and slide the unit cubes together ($5 + 3 = 8$) $\rightarrow 6x + 8$.

SC-6 Keystrokes:

4 ENTER 2 + 5 ENTER 3 +

Answer: $6x + 8$ Test $x=10$: Original $4(10)+5+2(10)+3 = 68$; Simplified..

SECTION 4.2 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Identifying Terms/Coefficients/Constants & Sorting and Combinin..

1 Big Ideas Method: Combining Like Terms

Sort and simplify: $7x + 4 + 2x + 9$.

Work:

Answer: _____

2 Big Ideas Method: Combining Like Terms

Simplify: $8x + 11 - 3x - 4$.

Work:

Answer: _____

3 Big Ideas Method: Combining Like Terms

Simplify: $9y - y + 6$. (Remember: $-y$ means $-1y$!)

Work:

Answer: _____

4 Big Ideas Method: Combining Like Terms

Simplify: $12a + 5 - 4a + 8$.

Work:

Answer: _____

5 Big Ideas Method: x^2 -Flats vs. x -Rods vs. Constants

Sort all 3 tile shapes: $4x^2 + 3x + 2x^2 + 5x + 7$.

Work:

Answer: _____

6 Big Ideas Method: x^2 -Flats vs. x -Rods vs. Constants

Simplify: $6n^2 + 9n - 2n^2 - 4n + 10$.

Work:

Answer: _____

7 Big Ideas Method: x^2 -Flats vs. x -Rods vs. Constants

Simplify with decimals: $3.5x + 4.2 + 1.8x - 1.5$.

Work:

Answer: _____

8 Big Ideas Method: x^2 -Flats vs. x -Rods vs. Constants

Spot the Glitch: Leo simplified $5x + 3$ to $8x$. Test $x = 10$ on your SC-6 to prove $5x + 3 \neq 8x$!

Work:

Answer: _____

9 Application & 2-Way Check: Perimeter & Equivalence Check

A rectangle has two sides of $(2x + 3)$ and two sides of $(x + 5)$. Write its simplified perimeter & test $x=10$!

Work:

Answer: _____

10 Application & 2-Way Check: Perimeter & Equivalence Check

A triangle has sides $(3x + 2)$, $(2x + 7)$, and $(4x - 1)$. Write the simplified perimeter & test $x=5$!

Work:

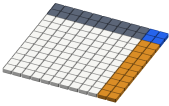
Answer: _____

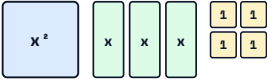
Section 4.3: The Distributive Property — One Split Rectangle, Two Ways

Big Ideas Method: The Distributive Property Area Model — Splitting Rectangles as $a(b + c) = ab + ac$ Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:
Why does $3(x + 4) = 3x + 12$? Build 3 identical rows of (1 green x-rod + 4 yellow cubes) on the Algebra Stage. Count by rows: $3(x + 4)$. Count by shape columns: 3 x-rods + 12 cubes = $3x + 12$! Same tiles on your desk, two ways to name the area!

BLOCK KIT & STEP-BY-STEP GUIDE (ALGB-01: ALGEBRA BOXES & TILES)





Sort by Shape:
x²-Flats | x-Rods | 1-Cubes

HOW TO BUILD IT WITH ALGB-01 (ALGEBRA BOXES & TILES):
Step 1: Open Kit ALGB-01 / COUNT-01 and build a rectangle 6 rows tall by (10 + 4) columns wide.
Step 2: Way 1 (Total Width): Add 10 + 4 = 14 columns first, then multiply $6 \times 14 = 84$ tiles.
Step 3: Way 2 (Split Rectangle): Multiply Left Room ($6 \times 10 = 60$) + Right Room ($6 \times 4 = 24$) = 84 tiles!

WORKED EXAMPLE — EXAMPLE 1: NUMERICAL SPLIT RECTANGLE $6(10 + 4)$

Problem: Compute $6 \times (10 + 4)$ both ways on your SC-6 to see why distribution works.

Big Ideas Textbook Method (The Distributive Property Area Model — Splitting Rectangles as $a(b + c) = ..$

- Numeric Distribution: $6(10 + 4) = 6(10) + 6(4) = 60 + 24 = 84$.
- Algebraic Distribution: Multiply the outside factor by EVERY term inside the parentheses: $4(3x + 5) = 4(3x) + 4(5) = 12x + 20$.
- If like terms remain outside, combine them after distributing.

Block Connection (ALGB-01): Way A (Add inside first): $6 \times 14 = 84$. Way B (Split into 2 rooms): 6×10 (60) + 6×4 (24) = 84!

SC-6 Keystrokes: 6 ENTER 10 x 6 ENTER 4 x +

Answer: 84 (Matches $6 \times 14 = 84$) *Floor 2 holds Room 1 (60) while Floor 1 holds Room..*

SECTION 4.3 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER Method Focus: The Distributive Property Area Model — Splitting Rectangles as..

1 Big Ideas Method: Area Model & Mental Math Split
Compute $7 \times (20 + 3)$ both ways on your SC-6. Write the two partial products.

Work: _____

Answer: _____

2 Big Ideas Method: Area Model & Mental Math Split
Build 4 rows of $(x + 5)$ and write the distributed expression for $4(x + 5)$.

Work: _____

Answer: _____

3 Big Ideas Method: Area Model & Mental Math Split
Use the Distributive Property to expand $6(3x + 4)$.

Work: _____

Answer: _____

4 Big Ideas Method: Area Model & Mental Math Split
Expand $8(2y - 5)$. Watch the subtraction sign!

Work: _____

Answer: _____

5 Big Ideas Method: Distributing Over Addition/Subtraction
Mental Math Split: Compute 9×43 by splitting 43 into $(40 + 3)$.

Work: _____

Answer: _____

6 Big Ideas Method: Distributing Over Addition/Subtraction
Distribute and combine like terms: $3(4x + 2) + 5x$.

Work: _____

Answer: _____

7 Big Ideas Method: Distributing Over Addition/Subtraction
Distribute and combine: $4(3n + 5) - 7$.

Work: _____

Answer: _____

8 Big Ideas Method: Distributing Over Addition/Subtraction
Spot the Glitch: Mia wrote $5(x + 6) = 5x + 6$. What did she forget to multiply by 5?

Work: _____

Answer: _____

9 Application & 2-Way Check: Distribute Then Combine Terms
Simplify $5(2x + 3) + 4x$ AND prove your answer matches the original when $x = 2$!

Work: _____

Answer: _____

10 Application & 2-Way Check: Distribute Then Combine Terms
6 friends each buy a burger (\$x) and \$3.50 fries: $6(x + 3.50)$. Expand it and evaluate for $x = \$6.50$!

Work: _____

Answer: _____

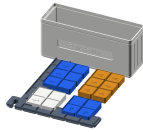
Section 4.4: Factoring Expressions with GCF — Reverse the Rectangle

Big Ideas Method: Factoring Numerical & Algebraic Expressions by Dividing Out the Greatest Common Factor (GCF)

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

'Factoring' sounds hard, but it is just running Section 4.3's Distributive Property in reverse using Section 1.5's [GCF] key! To factor $18x + 24$, press 18 [ENTER] 24 [GCF] -> 6 (that's the number of equal rows!). Divide 18x and 24 by 6 to get $6(3x + 4)$!

BLOCK KIT & STEP-BY-STEP GUIDE (ALGB-01: ALGEBRA & PRIME STUDIO)

Sort by Shape:
 x^2 -Flats | x -Rods | 1-Cubes

HOW TO BUILD IT WITH ALGB-01 (ALGEBRA & PRIME STUDIO):

Step 1: Open Kit ALGB-01 (Algebra Boxes & Stage) and place 18 green x-rods and 24 yellow unit cubes on the stage for $18x + 24$.

Step 2: Find the greatest number of identical rows you can arrange: $GCF(18, 24) = 6$ equal rows.

Step 3: Place $18x \div 6 = 3$ x-rods and $24 \div 6 = 4$ unit cubes in each of the 6 rows to read $6(3x + 4)$!

WORKED EXAMPLE — EXAMPLE 1: FACTORING NUMBERS & ALGEBRA WITH [GCF]

Problem: Factor $18x + 24$ completely using the [GCF] key.

Big Ideas Textbook Method (Factoring Numerical & Algebraic Expressions by Dividing Out the Greatest Common Factor):

- Find the GCF of the terms in $18x + 24$: $GCF(18, 24) = 6$.
- Divide each term by the GCF: $18x \div 6 = 3x$ and $24 \div 6 = 4$.
- Write the expression as a product of the GCF and the remaining sum: $6(3x + 4)$.

Block Connection (ALGB-01): Find the largest number of equal rows: 18 [ENTER] 24 [GCF] -> 6 rows! Each of the 6 rows has $18 \div 6 = 3$ x-rods and $24 \div 6 = 4$ cubes.

SC-6 Keystrokes:

18

ENTER

24

GCF

Answer: $6(3x + 4)$

Check by distributing back: $6 \times 3x = 18x$ and $6 \times 4 = 24$.

SECTION 4.4 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Factoring Numerical & Algebraic Expressions by Dividing Out the...

- 1** Big Ideas Method: Factoring Out Numerical GCF
Factor $12 + 20$ into the form $a(b + c)$ using [GCF].

Work:

Answer: _____

- 2** Big Ideas Method: Factoring Out Numerical GCF
Factor $8x + 12$ using [GCF].

Work:

Answer: _____

- 3** Big Ideas Method: Factoring Out Numerical GCF
Factor $15y - 25$ using [GCF].

Work:

Answer: _____

- 4** Big Ideas Method: Factoring Out Numerical GCF
Factor $24x + 36$ completely using [GCF].

Work:

Answer: _____

- 5** Big Ideas Method: Factoring Algebraic Expressions
Factor $32n - 48$ completely using [GCF].

Work:

Answer: _____

- 6** Big Ideas Method: Factoring Algebraic Expressions
Factor $42a + 14$ completely. (Careful: what is $14 \div 14$?)

Work:

Answer: _____

- 7** Big Ideas Method: Factoring Algebraic Expressions
Factor $36m - 60$ completely using [GCF].

Work:

Answer: _____

- 8** Big Ideas Method: Factoring Algebraic Expressions
Spot the Glitch: Sam factored $24x + 36$ as $6(4x + 6)$. Why isn't it factored completely?

Work:

Answer: _____

- 9** Application & 2-Way Check: Reverse Area Model (Width $\times$ Length)
A rectangular banner has area $(28x + 42)$ sq in and height 14 in. Factor with [GCF] to find its width!

Work:

Answer: _____

- 10** Application & 2-Way Check: Reverse Area Model (Width $\times$ Length)
A square garden has perimeter $(36x + 48)$ ft. Factor out 4 to find the length of 1 side!

Work:

Answer: _____

Section 5.1: Areas of Parallelograms & Rectangles ([f] [RECT])

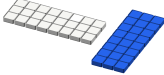
Big Ideas Method: Parallelogram Cut-and-Slide Area Formula ($A = b \cdot h$) Using Perpendicular Height

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Textbooks always label a trap number on parallelograms: Base b , straight vertical Height h , AND the slanted side s . If you chop the corner triangle off one end and slide it to the other, every parallelogram turns into a straight $b \times h$ Rectangle! Cross out the slanted side and press b [ENTER] h [f] [RECT] ([f][7])!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)





Base $b = 12$

$h = 8$

$\times 10$

HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):

Step 1: Open Kit COUNT-01 (Counting & Array Tiles) and build a parallelogram with base $b = 12$ and vertical height $h = 8$.
Step 2: Slice the right-triangle overhang off the left side and slide it to the right side—it forms a 12×8 rectangle!
Step 3: Multiply Base $\times$ Perpendicular Height: $12 \times 8 = 96 \text{ cm}^2$ (ignore the 10 cm slanted side for area!).

WORKED EXAMPLE — EXAMPLE 1: DODGE THE SLANTED TRAP WITH [F] [RECT]

Problem: Find the area of a parallelogram with base $b = 12 \text{ cm}$, vertical height $h = 8 \text{ cm}$, and slanted side 10 cm .

Big Ideas Textbook Method (Parallelogram Cut-and-Slide Area Formula ($A = b \cdot h$) Using Perpendicular..
1. Identify the base $b = 12 \text{ cm}$ and the perpendicular height $h = 8 \text{ cm}$ (do NOT use the 10 cm slant side for area).
2. Apply the Parallelogram Area Formula: $A = b \times h = 12 \times 8 = 96 \text{ cm}^2$.
3. Use the slanted side ONLY when finding Perimeter: $P = 2(12 + 10) = 44 \text{ cm}$.

Block Connection (COUNT-01): Cross out the slanted 10 cm trap! Push Base 12 onto Y, vertical Height 8 onto X, and press [f] [RECT] ([f][7]).

SC-6 Keystrokes:

12

ENTER

8

f

RECT

Answer: 96 cm^2

[f] [RECT] multiplies Base (Y) $\times$ Height (X) $\rightarrow 96 \text{ cm}^2$

SECTION 5.1 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Parallelogram Cut-and-Slide Area Formula ($A = b \cdot h$) Using Perp..

1

Big Ideas Method: Parallelogram Area ($A = bh$)
Find the area of a parallelogram with base $b = 15 \text{ m}$, vertical height $h = 9 \text{ m}$, and slanted side 11 m .

Work: _____

Answer: _____

2

Big Ideas Method: Parallelogram Area ($A = bh$)
Find the area of a rectangle measuring 18 ft by 12 ft using [f] [RECT].

Work: _____

Answer: _____

3

Big Ideas Method: Parallelogram Area ($A = bh$)
Find the area of a parallelogram with $b = 8.5 \text{ m}$ and vertical height $h = 6.4 \text{ m}$.

Work: _____

Answer: _____

4

Big Ideas Method: Parallelogram Area ($A = bh$)
Find the area of a square tile with side 13 cm.

Work: _____

Answer: _____

5

Big Ideas Method: Missing Base/Height ($b = A \div h$)
A parallelogram has base $b = 6 \frac{1}{2} \text{ in}$ and height $h = 4 \text{ in}$. Find its area.

Work: _____

Answer: _____

6

Big Ideas Method: Missing Base/Height ($b = A \div h$)
Missing Height: A parallelogram has Area $= 108 \text{ cm}^2$ and base $b = 12 \text{ cm}$. Find h .

Work: _____

Answer: _____

7

Big Ideas Method: Missing Base/Height ($b = A \div h$)
Missing Base: A parallelogram has Area $= 135 \text{ ft}^2$ and vertical height $h = 7.5 \text{ ft}$. Find b .

Work: _____

Answer: _____

8

Big Ideas Method: Missing Base/Height ($b = A \div h$)
Spot the Glitch: A parallelogram has $b = 10$, vertical $h = 6$, slanted side $= 7.5$. Sam got 75. Fix it!

Work: _____

Answer: _____

9

Application & 2-Way Check: Area vs. Perimeter & Frame Cutouts
A slanted parking space has base 9 ft and straight length 18.5 ft. How much asphalt covers 4 spaces?

Work: _____

Answer: _____

10

Application & 2-Way Check: Area vs. Perimeter & Frame Cutouts
A rectangular patio (15 ft $\times$ 12 ft) has a parallelogram planter ($b=4 \text{ ft}$, $h=3 \text{ ft}$) inside. Find the remaining patio area!

Work: _____

Answer: _____

StackCalc SC-6 Textbook Supplement • Unit 5: Areas of Polygons & Elapsed Time — Section 5.1 (Big Ideas Grade 6, Section 4.1 (Areas of Para..

Page 21 of 46

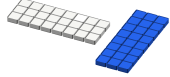
Section 5.2: Areas of Triangles — Half a Rectangle ([g] [TRI])

Big Ideas Method: Triangle Area as Half of a Parallelogram/Rectangle ($A = \frac{1}{2} \cdot b \cdot h$) & Double-Area Inverse

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

The #1 geometry test mistake is multiplying $b \times h$ for a triangle and forgetting to divide by 2! Look at key 7 on your SC-6: [f] [RECT] is $b \times h$, and right next to it, [g] [TRI] ([g][7]) computes $\frac{1}{2} \times b \times h$ in a single click so you never forget the $\frac{1}{2}$!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)

$$[g] [TRI] = \frac{1}{2} \times b \times h$$

HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):

Step 1: Open Kit COUNT-01 (Counting & Array Tiles) and build a 10×6 rectangle (Area = 60 unit squares).

Step 2: Cut the 10×6 rectangle diagonally from corner to corner into 2 congruent triangles.

Step 3: Each triangle has half the area of the rectangle: $A = \frac{1}{2} \times 10 \times 6 = 30 \text{ cm}^2$.

WORKED EXAMPLE — EXAMPLE 1: ONE-CLICK TRIANGLE AREA WITH [G] [TRI]

Problem: Find the area of a triangle with base $b = 10 \text{ cm}$ and height $h = 6 \text{ cm}$.

Big Ideas Textbook Method (Triangle Area as Half of a Parallelogram/Rectangle ($A = \frac{1}{2} \cdot b \cdot h$) & Doubl..

1. Identify the perpendicular base $b = 10 \text{ cm}$ and height $h = 6 \text{ cm}$.

2. Multiply base $\times$ height and divide by 2: $A = \frac{1}{2} \times 10 \times 6 = 60 \div 2 = 30 \text{ cm}^2$.

3. To find a missing base or height from Area, DOUBLE the area first (2A), then divide by the known dimension!

Block Connection (COUNT-01): A 10×6 rectangle has area 60 cm^2 . Cutting it diagonally in half gives two identical triangles of 30 cm^2 each!

SC-6 Keystrokes:

10

ENTER

6

g

TRI

Answer: 30 cm^2

[g] [TRI] ([g][7]) multiplies $Y \times X$ and divides by 2 auto..

SECTION 5.2 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWERMethod Focus: Triangle Area as Half of a Parallelogram/Rectangle ($A = \frac{1}{2} \cdot b \cdot h$..

- 1** Big Ideas Method: Triangle Area ($A = \frac{1}{2}bh$)
Find the area of a triangle with base $b = 14 \text{ ft}$ and height $h = 18 \text{ ft}$ using [g] [TRI].

Work:

Answer: _____

- 2** Big Ideas Method: Triangle Area ($A = \frac{1}{2}bh$)
Find the area of a right triangle with base 9 ft, vertical height 4 ft, and slanted hypotenuse 9.85 ft.

Work:

Answer: _____

- 3** Big Ideas Method: Triangle Area ($A = \frac{1}{2}bh$)
Find the area of a triangle with $b = 16 \text{ cm}$ and $h = 11 \text{ cm}$.

Work:

Answer: _____

- 4** Big Ideas Method: Triangle Area ($A = \frac{1}{2}bh$)
Find the area of a triangle with decimal dimensions: $b = 12.5 \text{ m}$, $h = 8.4 \text{ m}$.

Work:

Answer: _____

- 5** Big Ideas Method: Missing Base/Height ($2A \div b$)
Find the area of a triangle with fractional dimensions: $b = 4 \frac{1}{2} \text{ in}$, $h = 6 \text{ in}$.

Work:

Answer: _____

- 6** Big Ideas Method: Missing Base/Height ($2A \div b$)
Missing Height: A triangle has Area = 54 cm^2 and base $b = 12 \text{ cm}$. (Double 54 first, then $\div 12$!)

Work:

Answer: _____

- 7** Big Ideas Method: Missing Base/Height ($2A \div b$)
Missing Base: A triangle has Area = 84 m^2 and height $h = 14 \text{ m}$. Find base b .

Work:

Answer: _____

- 8** Big Ideas Method: Missing Base/Height ($2A \div b$)
Spot the Glitch: Leo found the area of a $b=8$, $h=5$ triangle as 40. What did he calculate instead?

Work:

Answer: _____

- 9** Application & 2-Way Check: Right Triangle & Pennant Area
A sailboat has a main sail ($b=12 \text{ ft}$, $h=25 \text{ ft}$) and jib sail ($b=8 \text{ ft}$, $h=15 \text{ ft}$). Find total sail area 2 ways!

Work:

Answer: _____

- 10** Application & 2-Way Check: Right Triangle & Pennant Area
A triangular gable window has Area = 36 ft^2 and base 9 ft. Find its height and check with [g] [TRI]!

Work:

Answer: _____

Section 5.3: Trapezoids & Composite Figures with the [Σ+] Running Ledger

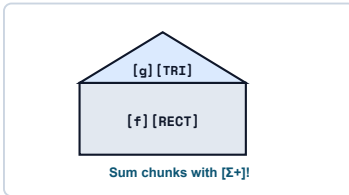
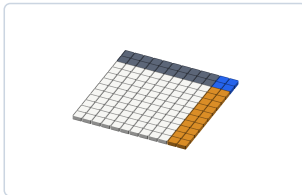
Big Ideas Method: Trapezoid Area Formula $A = \frac{1}{2}h(b_1 + b_2)$ & Decomposing Composite Figures into Simple Chunks

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Composite figures (weird shapes made of rectangles and triangles) are easy when you use the SC-6 [Σ+] running accumulator! Clear memory with [g] [CLΣ] ([g][+]). Compute each simple piece ([f] [RECT] or [g] [TRI]) and tap [Σ+] to toss it in the bucket (use [f] [Σ-] to subtract a cutout hole), then read the grand total with [f] [Σx] ([f][N])!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)



HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):

Step 1: Open Kit COUNT-01 (Counting & Array Tiles) and split the house wall into **Chunk 1** (12 × 8 rectangle) and **Chunk 2** (12 × 5 roof triangle).

Step 2: Compute Chunk 1 = $12 \times 8 = 96 \text{ ft}^2$ and Chunk 2 = $\frac{1}{2} \times 12 \times 5 = 30 \text{ ft}^2$.

Step 3: Add the non-overlapping chunks together (or accumulate with [Σ+]): $96 + 30 = 126 \text{ ft}^2$!

WORKED EXAMPLE — EXAMPLE 1: HOUSE WALL COMPOSITE (RECTANGLE + TRIANGLE VIA [Σ+])

Problem: Find the total area of a 12 ft × 8 ft rectangular wall topped by a roof triangle (b = 12 ft, h = 5 ft).

Big Ideas Textbook Method (Trapezoid Area Formula $A = \frac{1}{2}h(b_1 + b_2)$ & Decomposing Composite Figu..

1. Composite Figures: Split the figure into rectangles and triangles, find each area (96 and 30), and add: $96 + 30 = 126 \text{ ft}^2$.

2. Trapezoid Formula: Add the two parallel bases ($b_1 + b_2$), multiply by height h , and divide by 2: $A = \frac{1}{2}h(b_1 + b_2)$.

3. Cutout Figures: Subtract the inner hole area from the outer rectangle area.

Block Connection (COUNT-01): Clear stats ([g] [CLΣ]). Piece 1: 12 [ENTER] 8 [f] [RECT] [Σ+] (96, n=1). Piece 2: 12 [ENTER] 5 [g] [TRI] [Σ+] (30, n=2). Read [f] [Σx]!

SC-6 Keystrokes:

**Answer: 126 ft²**The screen counts $n = 1$, $n = 2$ so you never forget a..

SECTION 5.3 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Trapezoid Area Formula $A = \frac{1}{2}h(b_1 + b_2)$ & Decomposing Composite..

- 1** Big Ideas Method: Trapezoid Formula $A = \frac{1}{2}h(b_1 + b_2)$
Find the area of a trapezoid with $b_1 = 10 \text{ cm}$, $b_2 = 14 \text{ cm}$, and $h = 6 \text{ cm}$ using $(b_1 + b_2)$ [ENTER] h [g] [TRI].

Work:

Answer: _____

- 2** Big Ideas Method: Trapezoid Formula $A = \frac{1}{2}h(b_1 + b_2)$
Find the area of a trapezoid with $b_1 = 18 \text{ ft}$, $b_2 = 12 \text{ ft}$, and $h = 9 \text{ ft}$.

Work:

Answer: _____

- 3** Big Ideas Method: Trapezoid Formula $A = \frac{1}{2}h(b_1 + b_2)$
L-Shape Room: Split into Room A (10×6) and Room B (8×4). Sum with [Σ+] and [f] [Σx].

Work:

Answer: _____

- 4** Big Ideas Method: Trapezoid Formula $A = \frac{1}{2}h(b_1 + b_2)$
Banner Arrow: A 15×6 rectangle attached to a triangle ($b = 10$, $h = 6$). Find total area.

Work:

Answer: _____

- 5** Big Ideas Method: Composite Figure Decomposition
Find the area of a trapezoid with decimal bases $b_1 = 8.5 \text{ m}$, $b_2 = 5.5 \text{ m}$, and $h = 4.2 \text{ m}$.

Work:

Answer: _____

- 6** Big Ideas Method: Composite Figure Decomposition
Cutout Frame: A $10 \text{ in} \times 8 \text{ in}$ in frame has a $6 \text{ in} \times 4 \text{ in}$ in hole cut out. Use [Σ+] and [f] [Σ-] to find the border area!

Work:

Answer: _____

- 7** Big Ideas Method: Composite Figure Decomposition
Missing Trapezoid Height: A trapezoid has Area = 90 cm^2 and bases $b_1 = 11 \text{ cm}$, $b_2 = 7 \text{ cm}$. Find h .

Work:

Answer: _____

- 8** Big Ideas Method: Composite Figure Decomposition
A mini-golf hole is a $12 \times 5 \text{ ft}$ rectangle plus a trapezoid ($b_1 = 5$, $b_2 = 9$, $h = 4$). Find total area.

Work:

Answer: _____

- 9** Application & 2-Way Check: Shaded Cutout & Multi-Chunk Area
Find the area of a trapezoid ($b_1 = 10$, $b_2 = 16$, $h = 8$) both with the trapezoid formula AND by splitting into a $10 \times 8 \text{ rect}$ + $6 \times 8 \text{ triangle}$!

Work:

Answer: _____

- 10** Application & 2-Way Check: Shaded Cutout & Multi-Chunk Area
A $20 \text{ ft} \times 15 \text{ ft}$ lawn has a triangular flowerbed ($b = 8 \text{ ft}$, $h = 6 \text{ ft}$) and square shed ($5 \text{ ft} \times 5 \text{ ft}$). Find grass area!

Work:

Answer: _____

Section 5.4: Coordinate Polygons & Planetary Clock Base-60 Time ([CLK])

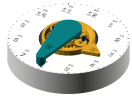
Big Ideas Method: Polygons in the Coordinate Plane (Side Lengths via Coordinates) & Base-60 Elapsed Time

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

On a coordinate grid, find rectangle side lengths by subtracting the x-coordinates and y-coordinates. And when adding/subtracting hours and minutes, remember time is Base-60! Press [CLK] on the SC-6 to enter H.MM mode (1.45 [ENTER] 1.35 [+] -> 3.20), or use [f] [->HR] ([f][CLK]) to turn 3 hr 15 min (3.15) into 3.25 decimal hours!

BLOCK KIT & STEP-BY-STEP GUIDE (TIME-01: PLANETARY GEARED CLOCK)



60 min = 1 hr ([CLK])

HOW TO BUILD IT WITH TIME-01 (PLANETARY GEARED CLOCK):

Step 1: Open Kit TIME-01 (Planetary Geared Clock) and COUNT-01 (Gridfinity Baseplate).

Step 2: On the grid, plot (2, 3), (9, 3), (9, 8), and (2, 8): count horizontal width $9 - 2 = 7$ and vertical height $8 - 3 = 5$ (Area = 35).

Step 3: On the Planetary Clock, dial 1 hr 45 min and advance 50 min—the 12:1 planetary gears carry 60 min into +1 hr automatically (2 hr 35 min)!

WORKED EXAMPLE — EXAMPLE 1: COORDINATE RECTANGLE PERIMETER & AREA

Problem: A rectangle has vertices (2, 3), (9, 3), (9, 8), and (2, 8). Find its width, height, perimeter, and area.

Big Ideas Textbook Method (Polygons in the Coordinate Plane (Side Lengths via Coordinates) & Base-60 Time):

1. Coordinate Polygon: Subtract x-coordinates for horizontal width ($9 - 2 = 7$) and y-coordinates for vertical height ($8 - 3 = 5$).

2. Compute Perimeter = $2(7 + 5) = 24$ units and Area = $7 \times 5 = 35$ sq units.

3. Base-60 Time: Regroup every 60 minutes into 1 hour (45 min + 50 min = 95 min = 1 hr 35 min).

Block Connection (TIME-01): Width = $9 - 2 = 7$ units. Height = $8 - 3 = 5$ units. Area = $7 \times 5 = 35$ sq units; Perimeter = $2(7 + 5) = 24$ units.

SC-6 Keystrokes:

[9] [ENTER] [2] [-] [8] [ENTER] [3] [-] [f] [RECT]

Answer: Width = 7, Height = 5, Perim. Subtract x-coords for horizontal width; subtract y-coor..

SECTION 5.4 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Polygons in the Coordinate Plane (Side Lengths via Coordinates)...

1 Big Ideas Method: Coordinate Polygon Side Lengths

Find the distance between (3, 4) and (11, 4) on a coordinate grid.

Work:

Answer: _____

2 Big Ideas Method: Coordinate Polygon Side Lengths

A rectangle has corners (1, 2), (10, 2), (10, 8), (1, 8). Find its area.

Work:

Answer: _____

3 Big Ideas Method: Coordinate Polygon Side Lengths

In [CLK] mode, add 1 hr 45 min + 1 hr 35 min (1.45 [ENTER] 1.35 [+]).

Work:

Answer: _____

4 Big Ideas Method: Coordinate Polygon Side Lengths

Convert 2 hr 30 min (2.30) to decimal hours using [f] [->HR].

Work:

Answer: _____

5 Big Ideas Method: Base-60 Elapsed Time Regrouping

Convert 4 hr 45 min (4.45) to decimal hours using [f] [->HR].

Work:

Answer: _____

6 Big Ideas Method: Base-60 Elapsed Time Regrouping

Convert 1.75 decimal hours back into Hours & Minutes using [g] [->HMS].

Work:

Answer: _____

7 Big Ideas Method: Base-60 Elapsed Time Regrouping

In [CLK] mode, find elapsed time from 8:50 AM to 11:25 AM (11.25 [ENTER] 8.50 [-]).

Work:

Answer: _____

8 Big Ideas Method: Base-60 Elapsed Time Regrouping

A right triangle on a grid has vertices (2, 1), (10, 1), and (2, 7). Find its area!

Work:

Answer: _____

9 Application & 2-Way Check: Grid Area & Time Addition/Subtraction

You tutor for 3 hr 15 min (3.15) at \$16/hr. Convert to decimal hours with [f] [->HR] and find your pay 2 ways!

Work:

Answer: _____

10 Application & 2-Way Check: Grid Area & Time Addition/Subtraction

Coordinate Park: Vertices (2, 2), (14, 2), (14, 11), (2, 11) where 1 unit = 10 yd. Find perimeter and area!

Work:

Answer: _____

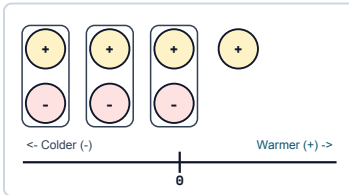
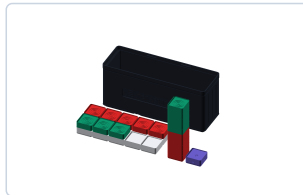
Section 6.1: Positive & Negative Integers — Zero Pairs & The $+/ -$ Sign Flipper

Big Ideas Method: Positive & Negative Integers on a Number Line, Zero Pairs & Opposites Across 0

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

On regular calculators, mixing up the minus key and negative key causes SYNTAX ERROR. On the SC-6, $[-]$ is the two-number subtraction action, while $+/ -$ flips the sign of the number on Floor 1 (X) between Positive (+) and Negative (-)—just like flipping a counter from Yellow (+) to Red (-)!

BLOCK KIT & STEP-BY-STEP GUIDE (BASE-10: TEN-FRAME ZERO-PAIR COUNTERS)**HOW TO BUILD IT WITH BASE-10 (TEN-FRAME ZERO-PAIR COUNTERS):**

- Step 1:** Open Kit BASE-10 / RACK-01 and set the center line as Zero (0 / Sea Level).
- Step 2:** Place 15 negative counters (-15) on the left side and 15 positive counters (+15) on the right side.
- Step 3:** Combine -15 and +15 into 15 Zero Pairs—every (+1, -1) pair cancels to 0, proving -15 and +15 are opposites!

WORKED EXAMPLE — EXAMPLE 1: OPPOSITES & ZERO-PAIR CANCELLATION WITH $+/ -$

Problem: Enter -15 on the SC-6, find its opposite, and verify that $-15 + 15 = 0$.

Big Ideas Textbook Method (Positive & Negative Integers on a Number Line, Zero Pairs & Opposites A..

1. Positive (+) integers represent gains/above 0; negative (-) integers represent losses/below 0; 0 is neither positive nor negative.
2. Two numbers the same distance from 0 on opposite sides are Opposites (-15 and +15), and their sum is 0.
3. The opposite of the opposite of a number returns to the original number: $-(-15) = +15$.

Block Connection (BASE-10): 15 Red (-1) counters and 15 Yellow (+1) counters pair up 1-for-1 into 15 Zero Pairs (= 0).

SC-6 Keystrokes:

15

+/ -

ENTER

15

+

Answer: Opposite of -15 is +15; -15.. Type the digits 15 first, THEN tap $+/ -$ to make it -15!

SECTION 6.1 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Positive & Negative Integers on a Number Line, Zero Pairs & Opp..

1 Big Ideas Method: Real-World Integer Sign

Write the integer for '25 feet below sea level' and find its opposite using $+/ -$.

Work:

Answer: _____

2 Big Ideas Method: Real-World Integer Sign

Find the opposite of -42, and then the opposite of the opposite ($-[-(-42)]$).

Work:

Answer: _____

3 Big Ideas Method: Real-World Integer Sign

Zero-Pair Cancellation: A submarine is at -18 m and rises +18 m. Where is it now?

Work:

Answer: _____

4 Big Ideas Method: Real-World Integer Sign

Combine 6 Yellow (+1) counters and 6 Red (-1) counters. What is the value?

Work:

Answer: _____

5 Big Ideas Method: Opposites & $-(-x)$ Double Flip

A hiker starts at -120 ft in a canyon and climbs +120 ft. What is her elevation?

Work:

Answer: _____

6 Big Ideas Method: Opposites & $-(-x)$ Double Flip

What integer is its own opposite? Test 0 $+/ -$ on your SC-6!

Work:

Answer: _____

7 Big Ideas Method: Opposites & $-(-x)$ Double Flip

Temperature starts at 0°F, drops 12°F (12 $+/ -$), and rises 19°F. Find the temperature.

Work:

Answer: _____

8 Big Ideas Method: Opposites & $-(-x)$ Double Flip

Golf Par: -3 means 3 strokes under par. If you shoot -3 on Saturday and +3 on Sunday, what is your total?

Work:

Answer: _____

9 Application & 2-Way Check: Zero-Reference Modeling

Elevator starts at Floor 0, goes up 14, down 20 (20 $+/ -$), and up 9. Find the floor 2 ways!

Work:

Answer: _____

10 Application & 2-Way Check: Zero-Reference Modeling

Game XP: You gain 40 XP, lose 65 XP, and gain 25 XP. Did you break even? Prove 2 ways!

Work:

Answer: _____

Section 6.2: Comparing & Ordering Integers and Rational Numbers

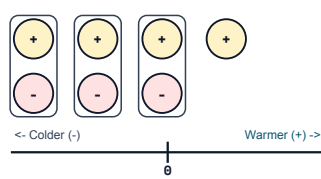
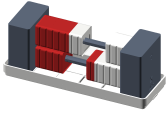
Big Ideas Method: Comparing & Ordering Integers, Decimals, and Fractions on a Number Line

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

When kids see -18 and -5, their instinct says -18 is bigger because $18 > 5$. Think of temperature: -5°F is WARMER than -18°F ! On a horizontal number line ([f] [LINE]), further to the RIGHT is always greater. Test any inequality on the SC-6 with [f] [>] ([f] [≠]) and [g] [<] ([g] [≠]): 1 = TRUE, 0 = FALSE!

BLOCK KIT & STEP-BY-STEP GUIDE (RACK-01: NUMBER RACK & NUMBER LINE)



HOW TO BUILD IT WITH RACK-01 (NUMBER RACK & NUMBER LINE):

Step 1: Open Kit RACK-01 (Number Rack) and mark 0 at the center, with negative numbers going left and positive going right.
Step 2: Locate -5 (5 steps left of 0) and -18 (18 steps left of 0).
Step 3: Apply the Number Line Rule: further RIGHT (closer to 0 for negatives) is ALWAYS greater, so $-5 > -18$!

WORKED EXAMPLE – EXAMPLE 1: TESTING NEGATIVE INEQUALITIES WITH [F] [>] & [G] ..

Problem: Compare -5 and -18. Which one is greater?

Big Ideas Textbook Method (Comparing & Ordering Integers, Decimals, and Fractions on a Number Line):

- Plot -5 and -18 on a horizontal number line.
- Because -5 is to the right of -18 (warmer / closer to 0), -5 is greater than -18 ($-5 > -18$).
- For negative fractions/decimals (e.g., $-3/4 = -0.75$ vs. $-1/2 = -0.50$), -0.50 is further right, so $-1/2 > -3/4$.

Block Connection (RACK-01): On the number line, -5 is 5 steps left of 0, while -18 is 18 steps left of 0. Since -5 is to the right of -18, $-5 > -18$!

SC-6 Keystrokes:

5 +/- ENTER 18 +/- f >

Answer: $-5 > -18$ (SC-6 outputs 1 = T.. If you test [g] [<], the SC-6 outputs 0 (FALSE)!

SECTION 6.2 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Comparing & Ordering Integers, Decimals, and Fractions on a Num..

- 1** Big Ideas Method: Number Line Inequality (< or >)
Which temperature is warmer (greater): -12°C or -5°C ? Test with [g] [<].

Work:

Answer: _____

- 2** Big Ideas Method: Number Line Inequality (< or >)
Compare -9 and -2 using > or <.

Work:

Answer: _____

- 3** Big Ideas Method: Number Line Inequality (< or >)
Compare -15 and 0 using > or <.

Work:

Answer: _____

- 4** Big Ideas Method: Number Line Inequality (< or >)
Order the integers from least to greatest: 4, -7, 0, -2, -10.

Work:

Answer: _____

- 5** Big Ideas Method: Comparing Negative Fractions/Decimals
Compare $-3/4$ and -0.6. (Hint: $-3/4 = -0.75$. Which is further right?)

Work:

Answer: _____

- 6** Big Ideas Method: Comparing Negative Fractions/Decimals
Compare $-2\frac{1}{2}$ and -2.3 using > or <.

Work:

Answer: _____

- 7** Big Ideas Method: Comparing Negative Fractions/Decimals
Compare $-5/8$ and $-7/8$.

Work:

Answer: _____

- 8** Big Ideas Method: Comparing Negative Fractions/Decimals
Spot the Glitch: Leo says $-4.5 > -4.1$ because $4.5 > 4.1$. Explain why -4.1 is actually greater!

Work:

Answer: _____

- 9** Application & 2-Way Check: Ordering Least to Greatest
Order -1.5, $1\frac{1}{4}$, $-1\frac{3}{4}$, and -0.5 from least to greatest. Verify both as decimals AND with [g] [<]!

Work:

Answer: _____

- 10** Application & 2-Way Check: Ordering Least to Greatest
Three divers are at -14.8 m, $-14\frac{1}{2}$ m, and -15.2 m. Who is deepest (least) and who is shallowest (greatest)?

Work:

Answer: _____

Section 6.3: Absolute Value — Distance From Zero Is Always Positive ($|g|$ $|x|$)

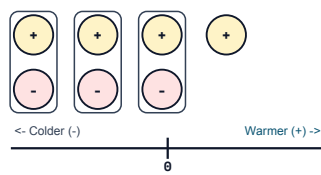
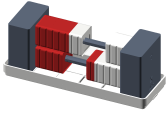
Big Ideas Method: Absolute Value $|x|$ as Distance from Zero (Always Non-Negative) & Evaluating $|x|$ Expressions

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Students often confuse Opposite ($[-/-]$) with Absolute Value ($|g|$ $|x|$, $|g|$ $|+/-|$). Opposite flips the sign ($+9 \rightarrow -9$, $-9 \rightarrow +9$). Absolute Value asks 'How many steps from 0?' Since you can't walk a negative number of steps, $|g|$ $|x|$ is ALWAYS positive (or 0)!

BLOCK KIT & STEP-BY-STEP GUIDE (RACK-01: NUMBER RACK & ZERO-PAIR STUDIO)



HOW TO BUILD IT WITH RACK-01 (NUMBER RACK & ZERO-PAIR STUDIO):

Step 1: Open Kit RACK-01 (Number Rack) and place a marker at -14 (14 beads left of 0) and +14 (14 beads right of 0).

Step 2: Count the physical distance from 0 to each marker: both are 14 steps from 0, so $|-14| = 14$ and $|14| = 14$.

Step 3: For $-|-14|$, first find the distance $|-14| = 14$, then apply the outside negative sign to get -14.

WORKED EXAMPLE — EXAMPLE 1: OPPOSITE ($[-/-]$) VS. ABSOLUTE VALUE ($|g|$ $|x|$)

Problem: Find $|-14|$, $|14|$, and $-|-14|$ on your SC-6.

Big Ideas Textbook Method (Absolute Value $|x|$ as Distance from Zero (Always Non-Negative) & Evalua..

1. Absolute value $|x|$ is the distance between x and 0 on a number line, so $|x| \geq 0$ always: $|-14| = 14$ and $|14| = 14$.
2. Evaluate inside absolute value bars first (like parentheses): $|-27| + |13| = 27 + 13 = 40$.
3. An outside negative sign applies after taking the absolute value: $-|-14| = -14$.

Block Connection (RACK-01): -14 is 14 steps from 0, so $|-14| = 14$. In $-|-14|$, find $|-14| = 14$ first, then apply the outside negative sign $\rightarrow -14$!

SC-6 Keystrokes:

14 +/- g |x|

Answer: $|-14| = 14$, $|14| = 14$, $-|-14|$ $|g|$ $|x|$ ($|g|$ $|+/-|$) makes any number on Floor 1 positive!

SECTION 6.3 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Absolute Value $|x|$ as Distance from Zero (Always Non-Negative)...

- 1** Big Ideas Method: Distance from Zero $|x|$
Find $|-27|$ using $|g|$ $|x|$.

Work:

Answer: _____

- 2** Big Ideas Method: Distance from Zero $|x|$
Evaluate $|-27| + |13|$.

Work:

Answer: _____

- 3** Big Ideas Method: Distance from Zero $|x|$
Evaluate $|-4.8| + |-3.2|$.

Work:

Answer: _____

- 4** Big Ideas Method: Distance from Zero $|x|$
Evaluate $|-35| - |-19|$.

Work:

Answer: _____

- 5** Big Ideas Method: Absolute Value Expressions
Compare $|-12|$ and $|9|$ using $>$ or $<$. (Which is further from 0?)

Work:

Answer: _____

- 6** Big Ideas Method: Absolute Value Expressions
Evaluate $|-24|$. (Find $|-24|$ first, then press $[-/-]$ for the outside minus!)

Work:

Answer: _____

- 7** Big Ideas Method: Absolute Value Expressions
Evaluate $50 - |-18|$. Find $|-18|$ first, then subtract from 50.

Work:

Answer: _____

- 8** Big Ideas Method: Absolute Value Expressions
Order from least to greatest: $|-8|$, -6 , $|-3|$, 0 , $|-9|$.

Work:

Answer: _____

- 9** Application & 2-Way Check: Magnitude (Debt/Depth) vs. Value
A diver is at -32 ft and a seagull is at +25 ft. Which is closer to sea level (0), and by how many feet?

Work:

Answer: _____

- 10** Application & 2-Way Check: Magnitude (Debt/Depth) vs. Value
Two accounts have balances of -\$45 and -\$28. Which account has the greater debt ($|-45|$ vs $|-28|$), and which has the greater balance?

Work:

Answer: _____

Section 6.4: The 4-Quadrant Coordinate Plane & Axis Reflections

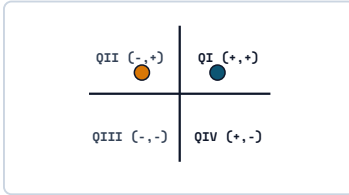
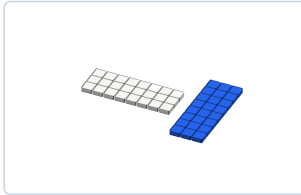
Big Ideas Method: Plotting (x, y) in All Four Quadrants (I, II, III, IV) & Reflecting Across the x- and y-Axes

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

To never mix up (x, y), use the Elevator Rule: walk ACROSS the lobby first (x: right +, left -), then ride UP/DOWN the elevator (y: up +, down -)! Reflecting across the y-axis flips the x-sign ([+/-]); reflecting across the x-axis flips the y-sign ([+/-])!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: 4X4 GRIDFINITY BASEPLATE & TIL..



HOW TO BUILD IT WITH COUNT-01 (4X4 GRIDFINITY BASEPLATE & TILES):

Step 1: Open Kit COUNT-01 (4x4 Gridfinity Baseplate) and divide the grid into 4 quadrants around the center origin (0, 0).

Step 2: Use the Elevator Rule for (x, y): walk ACROSS the x-axis first (+ right, - left), then ride UP/DOWN the y-axis (+ up, - down).

Step 3: Reflect across the x-axis by flipping the y-sign (x, -y); reflect across the y-axis by flipping the x-sign (-x, y).

WORKED EXAMPLE – EXAMPLE 1: NAMING QUADRANTS I, II, III, AND IV

Problem: Identify the quadrant for A(-6, 5), B(4, -7), and C(-3, -8).

Big Ideas Textbook Method (Plotting (x, y) in All Four Quadrants (I, II, III, IV) & Reflecting Across the x-.

1. Check coordinate signs: A(-6, 5) is (-, +) → Quadrant II; B(4, -7) is (+, -) → Quadrant IV; C(-3, -8) is (-, -) → Quadrant III.
2. Reflection across x-axis: keep x, flip y.
3. Reflection across y-axis: flip x, keep y.

Block Connection (COUNT-01): A(-, +) goes left 6, up 5 → Quad II. B(+, -) goes right 4, down 7 → Quad IV. C(-, -) goes left 3, down 8 → Quad III.

SC-6 Keystrokes:

Answer: A: Quad II, B: Quad IV, C: Q..

QI: (+, +), QII: (-, +), QIII: (-, -), QIV: (+, -)!

SECTION 6.4 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Plotting (x, y) in All Four Quadrants (I, II, III, IV) & Reflec..

- 1** Big Ideas Method: Quadrant Identification (I-IV)
Name the Quadrant (I, II, III, or IV) for point (7, -4).

Work:

Answer: _____

- 2** Big Ideas Method: Quadrant Identification (I-IV)
Name the Quadrant for point (-9, -2).

Work:

Answer: _____

- 3** Big Ideas Method: Quadrant Identification (I-IV)
Name the Quadrant for point (-5, 11).

Work:

Answer: _____

- 4** Big Ideas Method: Quadrant Identification (I-IV)
Reflect (6, 9) across the y-axis. (Flip the x-coordinate with [+/-])

Work:

Answer: _____

- 5** Big Ideas Method: x-Axis & y-Axis Reflections
Reflect (6, 9) across the x-axis. (Flip the y-coordinate with [+/-])

Work:

Answer: _____

- 6** Big Ideas Method: x-Axis & y-Axis Reflections
Reflect (-3, -7) across the x-axis.

Work:

Answer: _____

- 7** Big Ideas Method: x-Axis & y-Axis Reflections
Reflect (-8, 4) across the y-axis, and then across the x-axis.

Work:

Answer: _____

- 8** Big Ideas Method: x-Axis & y-Axis Reflections
On the Fence: Which axis does (0, -9) sit on, and which axis does (-7, 0) sit on?

Work:

Answer: _____

- 9** Application & 2-Way Check: Coordinate Grid Navigation
Start at (4, -5). Walk 7 units left and 8 units up. Where do you land, and in which quadrant?

Work:

Answer: _____

- 10** Application & 2-Way Check: Coordinate Grid Navigation
Points A(-4, 2), B(4, 2), and C(4, -5) are 3 corners of a rectangle. Find the 4th corner D!

Work:

Answer: _____

Section 6.5: Distance Between Points on the Coordinate Plane ([g] [|x|])

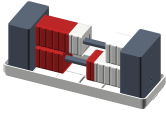
Big Ideas Method: Finding Horizontal & Vertical Distances on the Coordinate Plane Using Absolute Value

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

When two points share a coordinate like $(-6, 4)$ and $(9, 4)$, how far apart are they? If they are in different quadrants (cross an axis), add their distances to the axis ($|-6| + |9| = 15$). Even faster: on the SC-6, subtract ANY two coordinates and press [g] [|x|] ($-6 - 9 = -15 \rightarrow |-15| = 15$)!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: BASEPLATE & ZERO-PAIR STUDIO)



HOW TO BUILD IT WITH COUNT-01 (BASEPLATE & ZERO-PAIR STUDIO):

Step 1: Open Kit COUNT-01 / RACK-01 and snap tiles at $(-6, 4)$ in Quadrant II and $(9, 4)$ in Quadrant I.

Step 2: Count the steps from $(-6, 4)$ to the y-axis ($|-6| = 6$ steps) plus the steps from the y-axis to $(9, 4)$ ($|9| = 9$ steps).

Step 3: Add the distances across the axis: $6 + 9 = 15$ units (or subtract coordinates and take absolute value: $|-6 - 9| = 15$).

WORKED EXAMPLE — EXAMPLE 1: CROSS-AXIS DISTANCE VS. SAME-QUADRANT DISTANCE

Problem: Find the distance between $(-6, 4)$ and $(9, 4)$, and between $(-12, -3)$ and $(-4, -3)$.

Big Ideas Textbook Method (Finding Horizontal & Vertical Distances on the Coordinate Plane Using Ab..

1. Different Quadrants (points cross an axis, like -6 and 9): Add absolute values: $|-6| + |9| = 6 + 9 = 15$ units.
2. Same Quadrant (points on same side of axis, like -12 and -4): Subtract absolute values: $|-12| - |-4| = 12 - 4 = 8$ units.
3. Universal Formula: Distance = $|x_1 - x_2|$ (or $|y_1 - y_2|$).

Block Connection (COUNT-01): Cross-axis: $6 + 9 = 15$ units. Same quadrant: $12 - 4 = 8$ units. On SC-6, [subtract] then [g] [|x|] works for BOTH!

SC-6 Keystrokes:

6 +/- ENTER 9 - g |x|

Answer: 15 units; and 8 units

Subtracting and pressing [g] [|x|] works whether point..

SECTION 6.5 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Finding Horizontal & Vertical Distances on the Coordinate Plane..

- 1** Big Ideas Method: Cross-Axis / Same-Quadrant Distance
Find the horizontal distance between $(-8, 5)$ and $(11, 5)$.

Work:

Answer: _____

- 2** Big Ideas Method: Cross-Axis / Same-Quadrant Distance
Find the vertical distance between $(-3, -4)$ and $(-3, -15)$.

Work:

Answer: _____

- 3** Big Ideas Method: Cross-Axis / Same-Quadrant Distance
Find the vertical distance between $(7, 9)$ and $(7, -6)$.

Work:

Answer: _____

- 4** Big Ideas Method: Cross-Axis / Same-Quadrant Distance
Find the horizontal distance between $(-14, 2)$ and $(-5, 2)$.

Work:

Answer: _____

- 5** Big Ideas Method: Decimal & Fraction Coordinates
Find the distance between $(-3.5, 4)$ and $(6.5, 4)$.

Work:

Answer: _____

- 6** Big Ideas Method: Decimal & Fraction Coordinates
Find the distance between $(2, -4 \frac{1}{2})$ and $(2, 3 \frac{1}{2})$.

Work:

Answer: _____

- 7** Big Ideas Method: Decimal & Fraction Coordinates
A line segment starts at $(-6, 3)$ and goes 10 units right. What are the coordinates of the right endpoint?

Work:

Answer: _____

- 8** Big Ideas Method: Decimal & Fraction Coordinates
Spot the Glitch: For $(-5, 2)$ to $(8, 2)$, Sam subtracted $8 - 5 = 3$. Why is the distance 13, not 3?

Work:

Answer: _____

- 9** Application & 2-Way Check: Coordinate Rectangle Perimeter/Area
A treasure map rectangle has corners $(-4, 6)$, $(5, 6)$, $(5, -2)$, $(-4, -2)$. Find its perimeter & area 2 ways!

Work:

Answer: _____

- 10** Application & 2-Way Check: Coordinate Rectangle Perimeter/Area
On a city grid (1 unit = 0.5 mile), you walk from $(-6, -2)$ to $(-6, 8)$ to $(4, 8)$. How many miles did you walk?

Work:

Answer: _____

Section 7.1: Writing Equations & Testing Solutions — The Balance Scale Rule

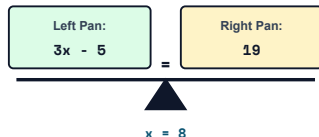
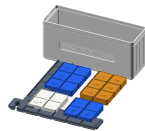
Big Ideas Method: Writing Equations in One Variable & Testing Solutions by Substitution (Balance Scale Rule)

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

In algebra, '=' is the center pivot of a Balance Scale! On your SC-6, Floor 2 (Y) is the Left Pan and Floor 1 (X) is the Right Pan. To test if $x = 8$ solves $3x - 5 = 19$, put 19 on Y, compute $3(8) - 5$ on X, and see Y: 19 | X: 19 (or press [g] [#] -> 0 difference)!

BLOCK KIT & STEP-BY-STEP GUIDE (ALGB-01: ALGEBRA BOXES & STAGE)



HOW TO BUILD IT WITH ALGB-01 (ALGEBRA BOXES & STAGE):

- Step 1:** Open Kit ALGB-01 (Algebra Boxes & Stage) and set the Balance Scale pivot (=) between the Left Pan and Right Pan.
- Step 2:** Place 4 x-rods and 5 unit cubes on the Left Pan ($4x + 5$) and 41 unit cubes on the Right Pan.
- Step 3:** Substitute $x = 9$ into each x-rod: $4(9) + 5 = 36 + 5 = 41$, matching the Right Pan (41 = 41, Balanced!).

WORKED EXAMPLE — EXAMPLE 1: BALANCE SCALE SOLUTION TESTER

Problem: Test whether $x = 7$ or $x = 9$ is the solution to $4x + 5 = 41$.

Big Ideas Textbook Method (Writing Equations in One Variable & Testing Solutions by Substitution (B..

- Test $x = 7$ in $4x + 5 = 41$: $4(7) + 5 = 28 + 5 = 33 \neq 41$ (Not a solution).
- Test $x = 9$ in $4x + 5 = 41$: $4(9) + 5 = 36 + 5 = 41 = 41$ (True! $x = 9$ is the solution).
- When translating phrases, watch turnaround words: '8 less than n is 25' is $n - 8 = 25$.

Block Connection (ALGB-01): Park 41 on Y. Test $x = 7$: $4(7)+5 = 33$ (Not 41!). Test $x = 9$: $4(9)+5 = 41$ (Matches Y = 41—Balanced!).

SC-6 Keystrokes:

41 ENTER 4 ENTER 9 × 5 +

Answer: $x = 9$ is the solution (41 == JWhen Floor 2 (Y) and Floor 1 (X) match, the equation..

SECTION 7.1 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Writing Equations in One Variable & Testing Solutions by Substi..

1 Big Ideas Method: Substitution Solution Test

Test whether $x = 6$ or $x = 8$ solves $5x - 7 = 33$.

Work:

Answer: _____

2 Big Ideas Method: Substitution Solution Test

Test whether $y = 12$ or $y = 15$ solves $y / 3 + 4 = 9$.

Work:

Answer: _____

3 Big Ideas Method: Substitution Solution Test

Translate into an equation: 'The sum of a number x and 14 is 52.'

Work:

Answer: _____

4 Big Ideas Method: Substitution Solution Test

Translate into an equation: '6 times a number k equals 84.'

Work:

Answer: _____

5 Big Ideas Method: Translating Verbal Equations

Translate: '9 less than a number w is 17.' (Watch the order!)

Work:

Answer: _____

6 Big Ideas Method: Translating Verbal Equations

Translate: 'The quotient of a number m and 5 is 13.'

Work:

Answer: _____

7 Big Ideas Method: Translating Verbal Equations

4 pizza pies (p) plus a \$6 delivery fee total \$54. Write the equation and test $p = 12$!

Work:

Answer: _____

8 Big Ideas Method: Translating Verbal Equations

Spot the Glitch: For '12 less than x is 20', Sam wrote $12 - x = 20$. Fix the equation and solve!

Work:

Answer: _____

9 Application & 2-Way Check: Real-World Equation Modeling

A streaming pass costs \$10 plus \$3 per movie ($10 + 3m = 28$). Find m by testing AND by undoing!

Work:

Answer: _____

10 Application & 2-Way Check: Real-World Equation Modeling

Three friends split a restaurant bill b equally and each pays \$14.50. Write the equation and find b !

Work:

Answer: _____

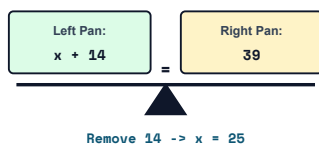
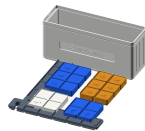
Section 7.2: Solving One-Step Addition & Subtraction Equations ([f] [LASTX])

Big Ideas Method: Subtraction & Addition Properties of Equality (Inverse Operations on Both Sides)

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Why does $x + 14 = 39$ become $39 - 14$? Because the Subtraction Property of Equality removes 14 cubes from both pans of the balance scale so the x-rod stands alone! And why does $x - 18 = 45$ become $45 + 18$? Because the Addition Property of Equality adds 18 back to both sides! Use [f] [LASTX] and the inverse operation to check!

BLOCK KIT & STEP-BY-STEP GUIDE (ALGB-01: ALGEBRA BOXES & STAGE)**HOW TO BUILD IT WITH ALGB-01 (ALGEBRA BOXES & STAGE):**

Step 1: Open Kit ALGB-01 (Algebra Boxes & Stage) and place 1 x-rod + 28 unit cubes on the Left Pan and 73 cubes on the Right Pan.

Step 2: Remove 28 unit cubes from BOTH pans to keep the scale balanced: $73 - 28 = 45$ cubes remain.

Step 3: Read the isolated x-rod value: $x = 45$, and check by adding 28 back: $45 + 28 = 73$!

WORKED EXAMPLE – EXAMPLE 1: UNDOING ADDITION ($x + 28 = 73$) + [F] [LASTX] PROOF

Problem: Solve $x + 28 = 73$ using the Subtraction Property of Equality and check your solution.

Big Ideas Textbook Method (Subtraction & Addition Properties of Equality (Inverse Operations on Bot..

1. Identify the operation on the variable in $x + 28 = 73$: addition (+ 28).
2. Apply the Subtraction Property of Equality (subtract 28 from both sides): $x = 73 - 28 = 45$.
3. Check by substituting $x = 45$ into the original equation: $45 + 28 = 73$.

Block Connection (ALGB-01): Remove 28 from both sides: 73 [ENTER] 28 [-] -> $x = 45$. Now tap [f] [LASTX] [+] -> $45 + 28 = 73$!

SC-6 Keystrokes:

73

ENTER

28

-

f

LASTX

+

Answer: $x = 45$ (Proven: $45 + 28 = 73$)*Subtracting 28 from both sides isolates $x = 45$!***SECTION 7.2 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWER**

Method Focus: Subtraction & Addition Properties of Equality (Inverse Operatio..

- 1** Big Ideas Method: Subtraction Property of Equality
Solve $x + 28 = 73$ and prove with [f] [LASTX] [+].

Work:

Answer: _____

- 2** Big Ideas Method: Subtraction Property of Equality
Solve $y - 34 = 58$ and prove with [f] [LASTX] [-].

Work:

Answer: _____

- 3** Big Ideas Method: Subtraction Property of Equality
Solve $19 + n = 64$.

Work:

Answer: _____

- 4** Big Ideas Method: Subtraction Property of Equality
Solve $k - 47 = 29$.

Work:

Answer: _____

- 5** Big Ideas Method: Addition Property of Equality
Solve $w - 19.6 = 34.8$.

Work:

Answer: _____

- 6** Big Ideas Method: Addition Property of Equality
Solve $p + 8.75 = 25.4$.

Work:

Answer: _____

- 7** Big Ideas Method: Addition Property of Equality
Solve $m + 3/8 = 5/6$ on your SC-6 and check with [f] [LASTX] [+].

Work:

Answer: _____

- 8** Big Ideas Method: Addition Property of Equality
Solve $a - 1\frac{1}{4} = 3\frac{1}{2}$.

Work:

Answer: _____

- 9** Application & 2-Way Check: 1-Step Inverse Equation & Check
After spending \$18.50 on a controller skin, you have \$26.75 left ($m - 18.50 = 26.75$). Find starting money m !

Work:

Answer: _____

- 10** Application & 2-Way Check: 1-Step Inverse Equation & Check
A drone climbs 42.5 ft to reach 110 ft ($h + 42.5 = 110$). Find its starting height h and prove with [f] [LASTX]!

Work:

Answer: _____

Section 7.3: Solving One-Step Multiplication & Division Equations

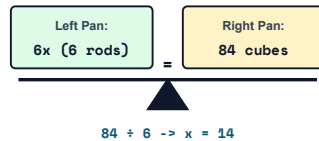
Big Ideas Method: Division & Multiplication Properties of Equality & Reciprocal Multiplication for Fractional Coefficients

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

When 6 identical x-rods balance 84 cubes ($6x = 84$), divide 84 into 6 equal piles (84 [ENTER] 6 [=] 14)! When a variable is divided ($k/7 = 14.5$), multiply by 7 to put the 7 parts back together! And for a fraction coefficient like $2/5n = 16$, either divide by $2/5$ OR flip with [f] [$1/x$] and multiply!

BLOCK KIT & STEP-BY-STEP GUIDE (ALGB-01: ALGEBRA & FRACTION STUDIO)



HOW TO BUILD IT WITH ALGB-01 (ALGEBRA & FRACTION STUDIO):

Step 1: Open Kit ALGB-01 (Algebra Boxes & Stage) and place 8 green x-rods on the Left Pan and 136 unit cubes on the Right Pan ($8x = 136$).

Step 2: Divide the 136 cubes equally among the 8 x-rods: $136 \div 8 = 17$ cubes per x-rod ($x = 17$).

Step 3: For $k/7 = 14.5$ (1 seventh of k is 14.5), combine 7 equal parts: $k = 14.5 \times 7 = 101.5$.

WORKED EXAMPLE — EXAMPLE 1: UNDOING MULTIPLICATION & DIVISION

Problem: Solve $8x = 136$ and $k/7 = 14.5$, and prove each with [f] [LASTX].

Big Ideas Textbook Method (Division & Multiplication Properties of Equality & Reciprocal Multiplication..

1. To solve $8x = 136$, use the Division Property of Equality (divide both sides by 8): $x = 136 \div 8 = 17$.
2. To solve $k/7 = 14.5$, use the Multiplication Property of Equality (multiply both sides by 7): $k = 14.5 \times 7 = 101.5$.
3. For fractional coefficients like $(3/4)x = 18$, multiply both sides by the reciprocal $4/3$: $x = 24$.

Block Connection (ALGB-01): For $8x = 136$: 136 [ENTER] 8 [=] 17 (Check: [f] [LASTX] [=] 136). For $k/7 = 14.5$: 14.5 [ENTER] 7 [=] 101.5.

SC-6 Keystrokes:

136 ENTER 8 ÷ 14.5 ENTER 7 ×

Answer: $x = 17$; $k = 101.5$

Division undoes multiplication; multiplication undoes..

SECTION 7.3 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Division & Multiplication Properties of Equality & Reciprocal M..

- 1** Big Ideas Method: Division / Multiplication Property
Solve $8x = 136$ and prove with [f] [LASTX] [=].

Work:

Answer: _____

- 2** Big Ideas Method: Division / Multiplication Property
Solve $12y = 180$ and prove with [f] [LASTX] [=].

Work:

Answer: _____

- 3** Big Ideas Method: Division / Multiplication Property
Solve $m/6 = 19$ and prove with [f] [LASTX] [=].

Work:

Answer: _____

- 4** Big Ideas Method: Division / Multiplication Property
Solve $k/7 = 14.5$.

Work:

Answer: _____

- 5** Big Ideas Method: Reciprocal Coefficient Solver
Solve $4.5w = 63$.

Work:

Answer: _____

- 6** Big Ideas Method: Reciprocal Coefficient Solver
Solve $3/4 x = 18$.

Work:

Answer: _____

- 7** Big Ideas Method: Reciprocal Coefficient Solver
Solve $2/5 n = 16$ using BOTH [=] and [f] [$1/x$] [=].

Work:

Answer: _____

- 8** Big Ideas Method: Reciprocal Coefficient Solver
Solve $5/6 p = 2/3$.

Work:

Answer: _____

- 9** Application & 2-Way Check: Rate & Geometry Formula Equation
A 3D printer prints at 1.5 cm/min. How long (t) to print a 27 cm tower ($1.5t = 27$)? Solve & prove!

Work:

Answer: _____

- 10** Application & 2-Way Check: Rate & Geometry Formula Equation
 $3/5$ of the students in a club ($3/5 s = 27$) are 6th graders. How many total students s are in the club?

Work:

Answer: _____

Section 7.4: Writing, Graphing & Solving Inequalities ([f] >], [g] [<], [f] ≥], [g] ≤])

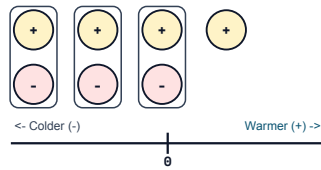
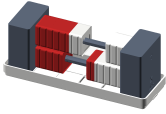
Big Ideas Method: Writing, Graphing & Solving 1-Step Inequalities (Open Circle <, > vs. Solid Circle ≤, ≥)

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Inequalities have infinitely many solutions! On a number line: '>' and '<' use an OPEN circle (o) because the boundary number is not included; '≥' (at least) and '≤' (at most) use a SOLID dot (•) because the boundary IS included! Solve just like one-step equations, then test boundary numbers with [f] [≥] ([f][+]) and [g] [≤] ([g][+])!

BLOCK KIT & STEP-BY-STEP GUIDE (RACK-01: NUMBER RACK & NUMBER LINE)



HOW TO BUILD IT WITH RACK-01 (NUMBER RACK & NUMBER LINE):

Step 1: Open Kit RACK-01 (Number Rack) and solve $x - 7 \geq 12$ by adding 7 to both sides → boundary at $x = 19$.

Step 2: Place a SOLID cap at 19 because $\geq$ includes 19 ('greater than or equal to'), and slide beads to the right (20, 21, ...).

Step 3: Test $x = 20$ in the original inequality: $20 - 7 = 13 \geq 12$ (True!).

WORKED EXAMPLE — EXAMPLE 1: SOLVING & GRAPHING $x - 7 \geq 12$

Problem: Solve $x - 7 \geq 12$, state whether the circle at 19 is Open or Solid, and test $x = 20$.

Big Ideas Textbook Method (Writing, Graphing & Solving 1-Step Inequalities (Open Circle <, > vs. Solid..

1. Solve $x - 7 \geq 12$ using the Addition Property of Inequality (add 7 to both sides): $x \geq 19$.

2. Graph on a number line: use a SOLID circle (•) at 19 for $\geq$ or $\leq$ (use an OPEN circle o for $>$ or $<$) and shade right.

3. Test a number in the shaded region: for $x = 20$, $20 - 7 = 13 \geq 12$ (True).

Block Connection (RACK-01): Add 7 to both sides: 12 [ENTER] 7 [+] $\rightarrow x \geq 19$. Because it is ' $\geq$ ', put a SOLID dot (•) at 19 and shade RIGHT!

SC-6 Keystrokes:

12 ENTER 7 + 20 x=y f ≥

Answer: $x \geq 19$ (Solid dot at 19, arr..

Testing $20 \geq 19$ with [f] [≥] outputs 1 (TRUE)!

SECTION 7.4 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Writing, Graphing & Solving 1-Step Inequalities (Open Circle <...

1 Big Ideas Method: Inequality Phrase & Solution Test

Solve $x + 8 > 21$. Tell whether the circle at 13 is Open or Solid, and arrow direction.

Work:

Answer: _____

2 Big Ideas Method: Inequality Phrase & Solution Test

Solve $y - 9 \leq 15$. Tell whether the circle at 24 is Open or Solid, and arrow direction.

Work:

Answer: _____

3 Big Ideas Method: Inequality Phrase & Solution Test

Solve $6n \geq 78$. Tell whether the circle at 13 is Open or Solid, and arrow direction.

Work:

Answer: _____

4 Big Ideas Method: Inequality Phrase & Solution Test

Solve $m / 4 < 9$. Tell whether the circle at 36 is Open or Solid, and arrow direction.

Work:

Answer: _____

5 Big Ideas Method: Open (o) vs. Solid (•) Graph

Translate: 'You must be at least 48 inches tall (h) to ride.' Write the inequality!

Work:

Answer: _____

6 Big Ideas Method: Open (o) vs. Solid (•) Graph

Translate: 'An elevator holds at most 2,000 pounds (w).' Write the inequality!

Work:

Answer: _____

7 Big Ideas Method: Open (o) vs. Solid (•) Graph

Which numbers from {4, 5, 6} are solutions to $4n + 3 > 23$? Test on your SC-6!

Work:

Answer: _____

8 Big Ideas Method: Open (o) vs. Solid (•) Graph

Which numbers from {4, 5, 6} are solutions to $4x - 3 \geq 17$?

Work:

Answer: _____

9 Application & 2-Way Check: Solving 1-Step Inequalities

You have \$50 to buy \$8 books ($8b \leq 50$). Solve with [g] [+R] to find the max whole books b you can buy!

Work:

Answer: _____

10 Application & 2-Way Check: Solving 1-Step Inequalities

A gamer needs at least 500 points ($p + 340 \geq 500$). Solve for p AND test p = 160 with [f] [≥]!

Work:

Answer: _____

Section 7.5: Two-Variable Relationships ($y = kx$ and $y = x + b$) — Tables & Graphs

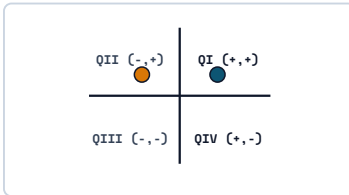
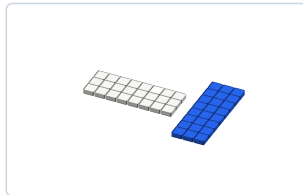
Big Ideas Method: Independent (Input x) & Dependent (Output y) Variables — Multiplicative ($y = kx$) vs. Additive ($y = x + b$)

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

How do you tell if a table of (x, y) points is an ADDITION rule ($y = x + b$) or a MULTIPLICATION rule ($y = kx$)? Check $y - x$ (if constant, it's $y = x + b$) and check $y \div x$ (if constant, it's $y = kx$)! Remember: x is the Independent variable (input you choose) and y is the Dependent variable (output that depends on x).

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)



HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):

Step 1: Open Kit COUNT-01 (Counting & Array Tiles) and compare the Input x and Output y columns for Table A and Table B.

Step 2: In Table A ((2, 14), (5, 35), (8, 56)), every Output y is 7 groups of x ($y \div x = 7$) -> Multiplicative rule $y = 7x$.

Step 3: In Table B ((10, 6), (15, 11), (22, 18)), every Output y is 4 tiles less than x ($y - x = -4$) -> Additive rule $y = x - 4$.

WORKED EXAMPLE — EXAMPLE 1: THE 2-SECOND RULE DETECTOR ($y = kx$ VS. $y = x + b$)

Problem: Table A has (2, 14), (5, 35), (8, 56). Table B has (10, 6), (15, 11), (22, 18). Find both equations.

Big Ideas Textbook Method (Independent (Input x) & Dependent (Output y) Variables — Multiplicative (..

1. Test for a Multiplicative Rule ($y = kx$): Divide $y \div x$ for each pair: $14 \div 2 = 7$, $35 \div 5 = 7$, $56 \div 8 = 7$ -> $y = 7x$.
2. Test for an Additive Rule ($y = x + b$): Subtract $y - x$ for each pair: $6 - 10 = -4$, $11 - 15 = -4$ -> $y = x - 4$.
3. The Independent Variable is the input x ; the Dependent Variable is the output y .

Block Connection (COUNT-01): Table A: $14 \div 2 = 7$, $35 \div 5 = 7$, $56 \div 8 = 7$ -> Multiplicative $y = 7x$! Table B: $10 - 4 = 6$, $15 - 4 = 11$ -> Additive $y = x - 4$!

SC-6 Keystrokes:

Answer: Table A: $y = 7x$; Table B: $y = x - 4$. Once you know $y = 7x$, find y at $x = 12$ with 7 [ENTE..

SECTION 7.5 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Independent (Input x) & Dependent (Output y) Variables — Multip..

1 Big Ideas Method: Multiplicative ($y = kx$) vs. Additive

Table has (1, 8), (2, 16), (3, 24). Write the equation and find y when $x = 10$.

Work:

Answer: _____

2 Big Ideas Method: Multiplicative ($y = kx$) vs. Additive

Table has (1, 9), (2, 10), (5, 13). Write the equation and find y when $x = 20$.

Work:

Answer: _____

3 Big Ideas Method: Multiplicative ($y = kx$) vs. Additive

Table has (2, 14), (5, 35), (8, 56). Write the equation and find y when $x = 12$.

Work:

Answer: _____

4 Big Ideas Method: Multiplicative ($y = kx$) vs. Additive

Table has (10, 6), (15, 11), (22, 18). Write the equation and find y when $x = 30$.

Work:

Answer: _____

5 Big Ideas Method: Independent & Dependent Variables

Use 6 [g] [REP] [+] to generate the y -values of $y = 6x$ for $x = 1, 2, 3, 4$.

Work:

Answer: _____

6 Big Ideas Method: Independent & Dependent Variables

In $d = 65t$ (distance d in miles after t hours), which variable is Independent and which is Dependent?

Work:

Answer: _____

7 Big Ideas Method: Independent & Dependent Variables

Using $d = 65t$, how far does the car travel in 4.5 hours?

Work:

Answer: _____

8 Big Ideas Method: Independent & Dependent Variables

Does the graph of $y = 4x$ pass through the origin (0, 0)? What about $y = x + 4$?

Work:

Answer: _____

9 Application & 2-Way Check: Two-Variable Rule & Prediction

You earn $p = 12.50h$. How many hours h must you work to earn \$100? Solve by division AND ratio doubling!

Work:

Answer: _____

10 Application & 2-Way Check: Two-Variable Rule & Prediction

A gym charges a \$25 signup fee plus \$15 per month (m). Write the equation for total cost c and find c for 12 months!

Work:

Answer: _____

Section 8.1: 3D Solids, Nets & Surface Area of Rectangular Prisms ([f] [RECT] + [Σ+])

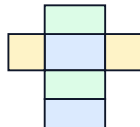
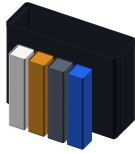
Big Ideas Method: Unfolding 3D Prisms into 2D Nets — Sum of 6 Rectangular Faces $SA = 2(lw + lh + wh)$

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Finding the surface area of a 6-sided box on paper is a magnet for mistakes because kids forget to double one of the 3 face pairs! Touch your physical Gridfinity box: clear memory ([g] [CLΣ]), compute each pair of opposite walls with | [ENTER] w [f] [RECT] 2 [x] [Σ+] (watch $n=1$, $n=2$, $n=3!$), and read the total with [f] [Σx]!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: 3X1 GRIDFINITY BOX & TILES)

3 Face Pairs → [Σ+] ($n=3$)

HOW TO BUILD IT WITH COUNT-01 (3X1 GRIDFINITY BOX & TILES):

Step 1: Open Kit COUNT-01 and inspect a rectangular prism measuring $l = 8$ cm, $w = 5$ cm, and $h = 3$ cm.

Step 2: Unfold its 6 faces into 3 congruent pairs: Top/Bottom ($8 \times 5 = 40$ each), Front/Back ($8 \times 3 = 24$ each), Left/Right ($5 \times 3 = 15$ each).

Step 3: Sum the 3 distinct face areas ($40 + 24 + 15 = 79$ cm²) and double for the 3 opposite pairs: $2 \times 79 = 158$ cm²!

WORKED EXAMPLE — EXAMPLE 1: THE 3-PAIR BOX LEDGER ([f] [RECT] 2 [x] [Σ+])

Problem: Find the surface area of a rectangular prism measuring 8 cm by 5 cm by 3 cm.

Big Ideas Textbook Method (Unfolding 3D Prisms into 2D Nets — Sum of 6 Rectangular Faces $SA = 2(lw + lh + wh)$):

1. Find the area of the 3 distinct face pairs: Bottom/Top = $8 \times 5 = 40$; Front/Back = $8 \times 3 = 24$; Sides = $5 \times 3 = 15$.
2. Add the 3 areas together: $40 + 24 + 15 = 79$ cm².
3. Multiply by 2 to include all 6 faces: $SA = 2 \times 79 = 158$ cm² (for a cube of edge s , $SA = 6s^2$).

Block Connection (COUNT-01): Clear ([g] [CLΣ]), Top/Bot: $8 \times 5 \times 2 = 80$ [Σ+] ($n=1$). Front/Back: $8 \times 3 \times 2 = 48$ [Σ+] ($n=2$). Left/Right: $5 \times 3 \times 2 = 30$ [Σ+] ($n=3$). Tap [f] [Σx]!

SC-6 Keystrokes:

**Answer: 158 cm²***Seeing $n = 3$ guarantees you logged all 3 pairs of fac..*

SECTION 8.1 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Unfolding 3D Prisms into 2D Nets — Sum of 6 Rectangular Faces $SA = 2(lw + lh + wh)$

- 1** Big Ideas Method: Rectangular Prism Net $SA = 2(lw + lh + wh)$
Find the surface area of a cube with edge length $s = 4$ cm ($6s^2$).

Work:

Answer: _____

- 2** Big Ideas Method: Rectangular Prism Net $SA = 2(lw + lh + wh)$
Find the surface area of a cube with edge length $s = 9$ in.

Work:

Answer: _____

- 3** Big Ideas Method: Rectangular Prism Net $SA = 2(lw + lh + wh)$
Find the surface area of a 6 cm by 4 cm by 3 cm rectangular prism using the 3-pair [Σ+] ledger.

Work:

Answer: _____

- 4** Big Ideas Method: Rectangular Prism Net $SA = 2(lw + lh + wh)$
Find the surface area of a 10 in by 5 in by 2 in rectangular box.

Work:

Answer: _____

- 5** Big Ideas Method: Cube $SA (6s^2)$ & Open-Top Box
Find the surface area of a prism with $l = 12$ ft, $w = 8$ ft, and $h = 5$ ft.

Work:

Answer: _____

- 6** Big Ideas Method: Cube $SA (6s^2)$ & Open-Top Box
Find the surface area of a prism with decimal edges: 5 m by 4 m by 2.5 m.

Work:

Answer: _____

- 7** Big Ideas Method: Cube $SA (6s^2)$ & Open-Top Box
A cube has a total surface area of 150 cm². What is the area of 1 face, and what is the edge length s ?

Work:

Answer: _____

- 8** Big Ideas Method: Cube $SA (6s^2)$ & Open-Top Box
Spot the Glitch: For a $5 \times 4 \times 3$ box, Leo added $20 + 15 + 12 = 47$. What did he forget to do?

Work:

Answer: _____

- 9** Application & 2-Way Check: 3D Solid Vertices, Edges & Faces
An open-top 3D-printed bin is 10 cm long, 8 cm wide, and 5 cm tall (NO lid!). Find its outer surface area 2 ways!

Work:

Answer: _____

- 10** Application & 2-Way Check: 3D Solid Vertices, Edges & Faces
You wrap a gift box (15 in $\times$ 10 in $\times$ 4 in). If you have 550 in² of wrapping paper, is it enough?

Work:

Answer: _____

Section 8.2: Surface Area of Triangular Prisms & Pyramids ([f] [RECT] + [g] [TRI] + [Σ+])

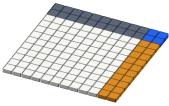
Big Ideas Method: 2D Nets of Triangular Prisms (2 Triangles + 3 Rectangles) & Square Pyramids (1 Base + 4 Triangles)

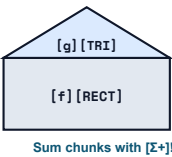
Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Never memorize complicated formulas for triangular prisms or pyramids! Just look at the flat shapes in the unfolded net: use [f] [RECT] for rectangular walls and [g] [TRI] for triangular faces, tossing each piece into [Σ+] and reading the sum with [f] [Σx]!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)





HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):

Step 1: Open Kit COUNT-01 and unfold the Square Pyramid net flat onto the desk: 1 square base (10 × 10) surrounded by 4 triangles.

Step 2: Compute the square base area: 10 × 10 = 100 m².

Step 3: Compute 1 triangular face using slant height l = 12: ½ × 10 × 12 = 60 m², then add all 4 triangles: 100 + 4(60) = 340 m²!

WORKED EXAMPLE – EXAMPLE 1: SQUARE PYRAMID TENT (1 SQUARE + 4 TRIANGLES)

Problem: Find the surface area of a square pyramid with a 10 m × 10 m base and 4 triangles (b = 10 m, slant height = 12 m).

Big Ideas Textbook Method (2D Nets of Triangular Prisms (2 Triangles + 3 Rectangles) & Square Pyra..

1. Square Base Area: B = 10 × 10 = 100 m².

2. Area of 1 Triangular Face (using slant height l = 12 m): A = ½ × 10 × 12 = 60 m².

3. Total Pyramid Surface Area: Base + 4 Triangles = 100 + 4(60) = 100 + 240 = 340 m².

Block Connection (COUNT-01): Clear ([g] [CLΣ]). Square Base: 10 [x²] [Σ+] (100). 4 Triangles: 10 [ENTER] 12 [g] [TRI] 4 [x] [Σ+] (240). Read [f] [Σx] -> 340 m²!

SC-6 Keystrokes:

g

CLΣ

10

x²

Σ+

10

ENTER

12

g

TRI

4

x

Σ+

f

Σx

Answer: 340 m²

1 Square Base (100) + 4 Identical Triangles (4 × 60 =..

SECTION 8.2 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: 2D Nets of Triangular Prisms (2 Triangles + 3 Rectangles) & Squa..

1

Big Ideas Method: Square Pyramid Net (B + 4 Triangles)

Square Pyramid: Base is 6 cm × 6 cm; 4 triangles each have b = 6 cm, slant height = 5 cm. Find SA.

Work: _____

Answer: _____

2

Big Ideas Method: Square Pyramid Net (B + 4 Triangles)

Square Pyramid: Base is 8 in × 8 in; 4 triangles each have b = 8 in, slant height = 10 in. Find SA.

Work: _____

Answer: _____

3

Big Ideas Method: Square Pyramid Net (B + 4 Triangles)

Square Pyramid: Base is 12 ft × 12 ft; 4 triangles each have b = 12 ft, slant height = 9 ft. Find SA.

Work: _____

Answer: _____

4

Big Ideas Method: Square Pyramid Net (B + 4 Triangles)

Regular Tetrahedron: Made of 4 identical equilateral triangles (b = 6 cm, h = 5.2 cm). Find total SA.

Work: _____

Answer: _____

5

Big Ideas Method: Triangular Prism Net (2 Tri + 3 Rect)

Triangular Prism: 2 triangle ends (b=4, h=3) + 3 rectangles of length 10 (widths 3, 4, 5). Find SA.

Work: _____

Answer: _____

6

Big Ideas Method: Triangular Prism Net (2 Tri + 3 Rect)

Triangular Prism Tent: 2 triangle ends (b=8 ft, h=3 ft) + 3 rectangles of length 7 ft (widths 5, 5, 8 ft).

Work: _____

Answer: _____

7

Big Ideas Method: Triangular Prism Net (2 Tri + 3 Rect)

A regular tetrahedron has 4 identical triangles with b = 8 cm and h = 6.93 cm. Find its surface area.

Work: _____

Answer: _____

8

Big Ideas Method: Triangular Prism Net (2 Tri + 3 Rect)

How many faces (triangles and rectangles) does a Triangular Prism have vs. a Square Pyramid?

Work: _____

Answer: _____

9

Application & 2-Way Check: Lateral vs. Total Surface Area

Camping Tent (Triangular Prism): 2 ends (b=6 ft, h=4 ft), floor (6×8 ft), and 2 roof sides (5×8 ft each). Find total fabric 2 ways!

Work: _____

Answer: _____

10

Application & 2-Way Check: Lateral vs. Total Surface Area

A glass pyramid skylight has NO bottom floor—only 4 triangular glass panes (b = 9 ft, slant h = 6 ft). Find glass area!

Work: _____

Answer: _____

StackCalc SC-6 Textbook Supplement • Unit 8: Surface Area & Volume of 3D Solids – Section 8.2 (Big Ideas Grade 6, Sections 8.2 & 8.3 (Surf..

Page 36 of 46

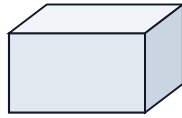
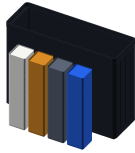
Section 8.3: Volume of Rectangular Prisms with Whole & Fractional Edges ([f] [PRISM])

Big Ideas Method: Base-Layer Volume Stacking ($V = B \cdot h = l \cdot w \cdot h$) with Whole, Fractional & Decimal Edges

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Surface Area is the flat cardboard on the outside; Volume is how many 3D unit cubes fit inside! On key 9 of your SC-6, [f] [PRISM] ([f][9]) takes Length (l) on Floor 3 (Z), Width (w) on Floor 2 (Y), and Height (h) on Floor 1 (X) and multiplies all three dimensions in a single click!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & FRACTION STUDIO)

1 [ENTER] w [ENTER] h [f] [PRISM]

HOW TO BUILD IT WITH COUNT-01 (COUNTING & FRACTION STUDIO):

Step 1: Open Kit COUNT-01 / FRAC-01 and build the bottom layer of a 12 in $\times$ 8 in crate: **Base Area $B = 12 \times 8 = 96$ unit cubes.**

Step 2: Stack $h = 5$ identical layers high to find the total volume: $V = 96 \times 5 = 480 \text{ in}^3$.

Step 3: For fractional edges ($3 \frac{1}{2} \times 1 \frac{1}{2} \times 2$), multiply the improper fractions: $(7/2) \times (3/2) \times 2 = 21/2 = 10 \frac{1}{2} \text{ ft}^3$.

WORKED EXAMPLE — EXAMPLE 1: 1-CLICK 3-FLOOR VOLUME WITH [F] [PRISM]

Problem: Find the volume of a shipping crate measuring 12 in $\times$ 8 in $\times$ 5 in, and an aquarium $3 \frac{1}{2} \text{ ft} \times 1 \frac{1}{2} \text{ ft} \times 2 \text{ ft}$.

Big Ideas Textbook Method (Base-Layer Volume Stacking ($V = B \cdot h = l \cdot w \cdot h$) with Whole, Fractional &..

1. Whole-Edge Crate: Multiply length $\times$ width $\times$ height: $V = 12 \times 8 \times 5 = 480 \text{ in}^3$.

2. Fractional-Edge Aquarium: Convert to improper fractions and multiply: $(7/2) \times (3/2) \times 2 = 10 \frac{1}{2} \text{ ft}^3$ (10.5 ft^3).

3. Missing Height/Depth: Divide Volume by Base Area ($l \times w$): $h = V \div (l \times w)$.

Block Connection (COUNT-01): Push l [ENTER] w [ENTER] h onto Z, Y, X and press [f] [PRISM] ([f][9])!

SC-6 Keystrokes:

12

ENTER

8

ENTER

5

f

PRISM

Answer: Crate = 480 in^3 ; Aquarium = . For the aquarium: 3.5 [ENTER] 1.5 [ENTER] 2 [f] [PR..

SECTION 8.3 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWERMethod Focus: Base-Layer Volume Stacking ($V = B \cdot h = l \cdot w \cdot h$) with Whole...

- 1** Big Ideas Method: Prism Volume ($V = l \times w \times h$)
Use [f] [PRISM] to find the volume of a box measuring 10 cm by 6 cm by 4 cm.

Work:

Answer: _____

- 2** Big Ideas Method: Prism Volume ($V = l \times w \times h$)
Find the volume of a cube with edge length 5 in using [g] [x³] or [f] [PRISM].

Work:

Answer: _____

- 3** Big Ideas Method: Prism Volume ($V = l \times w \times h$)
Find the volume of a crate measuring 15 ft by 8 ft by 6 ft.

Work:

Answer: _____

- 4** Big Ideas Method: Prism Volume ($V = l \times w \times h$)
A prism has Base Area $B = 32 \text{ m}^2$ and height $h = 7 \text{ m}$. Find its volume.

Work:

Answer: _____

- 5** Big Ideas Method: Fractional Edge & Unit-Cube Packing
Fractional Edges: Find the volume of a fish tank $3 \frac{1}{2} \text{ ft}$ long, $1 \frac{1}{2} \text{ ft}$ wide, and 2 ft tall.

Work:

Answer: _____

- 6** Big Ideas Method: Fractional Edge & Unit-Cube Packing
Fractional Edges: Find the volume of a block $4 \frac{1}{2} \text{ in}$ by 3 in by 2 in.

Work:

Answer: _____

- 7** Big Ideas Method: Fractional Edge & Unit-Cube Packing
Missing Height: A box has Volume = 270 in^3 , length = 9 in, and width = 5 in. Find height h .

Work:

Answer: _____

- 8** Big Ideas Method: Fractional Edge & Unit-Cube Packing
How many $\frac{1}{2}$ -inch mini-cubes fit inside 1 cubic inch? (Compute 2^3 !)

Work:

Answer: _____

- 9** Application & 2-Way Check: Missing Height ($h = V \div \text{Base Area}$)
A planter has Base Area 45 in^2 (9×5) and Volume 360 in^3 . Find depth h by division AND verify with [f] [PRISM]!

Work:

Answer: _____

- 10** Application & 2-Way Check: Missing Height ($h = V \div \text{Base Area}$)
How many $\frac{1}{2}$ -inch cubes fit inside a box with volume 27 in^3 ? (Multiply 27 by $2^3 = 8$!)

Work:

Answer: _____

Section 8.4: Circles, Cones & Right-Triangle Hypotenuse ([π], [f] [CIRC], [g] [CONE], [g] [HYP])

Big Ideas Method: Circle Area ($A = \pi r^2$) & Circumference ($C = 2\pi r$), Cone Volume ($V = \frac{1}{3}\pi r^2 h$) & Right-Triangle Hypotenuse..

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Look at keys 8 and 9 on your SC-6: they hold 1-click geometry superpowers! For a circle of radius r , press r [f] [CIRC] ([f][8]) to compute πr^2 instantly. For a right triangle with legs a and b , press a [ENTER] b [g] [HYP] ([g][8]) for $\sqrt{a^2+b^2}$. For a cone with radius r and height h , press r [ENTER] h [g] [CONE] ([g][9]) for $\frac{1}{3}\pi r^2 h$!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)



$$[g] [TRI] = \frac{1}{2} \times b \times h$$

HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):

Step 1: Open Kit COUNT-01 / PROB-01 and place a circle of radius $r = 6$ inside a $2r \times 2r$ square: Area = $\pi \times 6^2 \approx 113.10 \text{ in}^2$.

Step 2: Compare a Cone to a Cylinder of the same radius and height: exactly 3 cones fill 1 cylinder ($V = \frac{1}{3}\pi r^2 h$).

Step 3: Build squares on the legs of a 12×5 right triangle: $12^2 + 5^2 = 144 + 25 = 169$, and $\sqrt{169} = 13$ ft!

WORKED EXAMPLE — EXAMPLE 1: CIRCLE AREA ([f] [CIRC]) & 3-4-5 HYPOTENUSE ([g]..

Problem: Find the area of a pizza with radius $r = 6$ in, and the diagonal of a 12 ft by 5 ft ramp.

Big Ideas Textbook Method (Circle Area ($A = \pi r^2$) & Circumference ($C = 2\pi r$), Cone Volume ($V = \frac{1}{3}\pi r^2 h$)).

1. Circle Area ($r = 6$): $A = \pi r^2 = \pi \times 36 \approx 113.10 \text{ in}^2$ (Circumference $C = 2\pi r = 12\pi \approx 37.70 \text{ in}$).
2. Right-Triangle Hypotenuse ($a = 12$, $b = 5$): $c = \sqrt{12^2 + 5^2} = \sqrt{144 + 25} = \sqrt{169} = 13 \text{ ft}$.
3. Cone Volume: $V = \frac{1}{3} \times \pi \times r^2 \times h$.

Block Connection (COUNT-01): For $r = 6$: press 6 [f] [CIRC] -> 113.10 in². For legs 12 and 5: press 12 [ENTER] 5 [g] [HYP] -> 13 ft!

SC-6 Keystrokes:

6 **f** CIRC 12 ENTER 5 **g** HYP

Answer: Pizza = 113.10 in²; Ramp dia. Check 6 [f] [CIRC] against 6 [x²] [π] [x] -> identical 11..

SECTION 8.4 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Circle Area ($A = \pi r^2$) & Circumference ($C = 2\pi r$), Cone Volume ($V = \frac{1}{3}\pi r^2 h$) & Right-Triangle..

1 Big Ideas Method: Circle Area (πr^2) & Circumference

Find the area of a circle with radius $r = 5$ cm using [f] [CIRC].

Work:

Answer: _____

2 Big Ideas Method: Circle Area (πr^2) & Circumference

Find the area of a circle with radius $r = 10$ in using [f] [CIRC].

Work:

Answer: _____

3 Big Ideas Method: Circle Area (πr^2) & Circumference

Find the hypotenuse of a right triangle with legs $a = 3$ and $b = 4$ using [g] [HYP].

Work:

Answer: _____

4 Big Ideas Method: Circle Area (πr^2) & Circumference

Find the hypotenuse of a right triangle with legs $a = 6$ ft and $b = 8$ ft using [g] [HYP].

Work:

Answer: _____

5 Big Ideas Method: Cone Volume & 3-4-5 / 5-12-13 Triangles

Find the hypotenuse of a skate ramp with base 12 ft and back height 5 ft using [g] [HYP].

Work:

Answer: _____

6 Big Ideas Method: Cone Volume & 3-4-5 / 5-12-13 Triangles

A circle has diameter $d = 16$ m. Divide by 2 to find radius r , then press [f] [CIRC]!

Work:

Answer: _____

7 Big Ideas Method: Cone Volume & 3-4-5 / 5-12-13 Triangles

Find the volume of a cone with radius $r = 3$ cm and height $h = 12$ cm using [g] [CONE].

Work:

Answer: _____

8 Big Ideas Method: Cone Volume & 3-4-5 / 5-12-13 Triangles

Find the volume of a cone with radius $r = 6$ in and height $h = 5$ in using [g] [CONE].

Work:

Answer: _____

9 Application & 2-Way Check: Composite Semi-Circle & Ramp

Find the volume of a cone ($r = 3$ cm, $h = 10$ cm) both with [g] [CONE] AND via 3 [f] [CIRC] 10 [x] 3 [+]

Work:

Answer: _____

10 Application & 2-Way Check: Composite Semi-Circle & Ramp

TV screens are measured along the diagonal. A screen is 32 in wide and 24 in tall. Find its diagonal size 2 ways!

Work:

Answer: _____

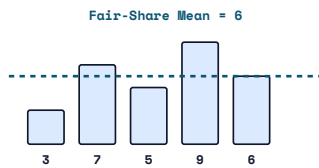
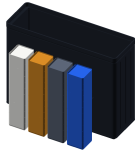
Section 9.1: Dot Plots, Frequency & Mean as 'Fair Share Leveling' (Σ +, [g] $\bar{x}$)

Big Ideas Method: Statistical Questions, Dot Plot Frequencies & Fair-Share Leveling for the Mean ($\bar{x} = \Sigma x \div n$)

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

What is the Mean (average) physically? If you build 5 unequal cube towers (3, 7, 5, 9, 6) and move cubes from the tallest towers onto the shortest ones until all 5 are the exact same height, every tower stands 6 cubes tall! On the SC-6, clear stats ([g] [CLΣ]), enter each number with Σ +, and press [g] $\bar{x}$ ([g][N])!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & ARRAY TILES)**HOW TO BUILD IT WITH COUNT-01 (COUNTING & ARRAY TILES):**

Step 1: Open Kit COUNT-01 (Counting & Array Tiles) and build 5 towers for the data values 18, 24, 15, 27, and 21.

Step 2: Move top tiles from the taller towers (27 and 24) to the shorter towers (15 and 18) until all 5 towers are level.

Step 3: All 5 leveled towers stand 21 tiles high—proving $\Sigma x = 105$, Count $n = 5$, and Fair-Share Mean $\bar{x} = 105 \div 5 = 21$!

WORKED EXAMPLE — EXAMPLE 1: FAIR-SHARE MEAN WITH Σ + & [G] $\bar{x}$

Problem: Find the sum ([f] Σx), count ([N]), and Mean ([g] $\bar{x}$) of 18, 24, 15, 27, 21.

Big Ideas Textbook Method (Statistical Questions, Dot Plot Frequencies & Fair-Share Leveling for the..

1. Add all data values to find the sum: $\Sigma x = 18 + 24 + 15 + 27 + 21 = 105$.
2. Count the number of values in the data set: $n = 5$.
3. Divide the sum by the count: Mean $\bar{x} = 105 \div 5 = 21$.

Block Connection (COUNT-01): Press [g] [CLΣ], then enter each score followed by Σ +. Tap [f] Σx for total (105), [N] for count (5), and [g] $\bar{x}$ for Mean (21)!

SC-6 Keystrokes:

Answer: Sum = 105, Count = 5, Mean = If you make a typo (e.g. 35 instead of 25), type 35 [f] [.

SECTION 9.1 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWERMethod Focus: Statistical Questions, Dot Plot Frequencies & Fair-Share Leveling for the Mean ($\bar{x} = \Sigma x \div n$)

- 1** Big Ideas Method: Fair-Share Mean ($\Sigma x \div n$)
Level the towers 2, 4, 6, 8. Find the sum ([f] Σx) and Mean ([g] $\bar{x}$).

Work:

Answer: _____

- 2** Big Ideas Method: Fair-Share Mean ($\Sigma x \div n$)
Find the sum and Mean of: 12, 15, 18, 11, 14.

Work:

Answer: _____

- 3** Big Ideas Method: Fair-Share Mean ($\Sigma x \div n$)
Find the Mean of your 5 gaming scores: 18, 24, 15, 27, 21.

Work:

Answer: _____

- 4** Big Ideas Method: Fair-Share Mean ($\Sigma x \div n$)
Find the Mean of these 4 decimal weights (g): 4.2, 3.8, 4.5, 3.5.

Work:

Answer: _____

- 5** Big Ideas Method: Dot Plot Peak, Cluster & Gap
Typo Rescue: Enter 10 Σ + 20 Σ + 35 Σ +, then remove 35 with 35 [f] Σ - and add 25 Σ +. Find [g] $\bar{x}$!

Work:

Answer: _____

- 6** Big Ideas Method: Dot Plot Peak, Cluster & Gap
Frequency Shortcut ([FRQ]): If 10 appears 4 times and 20 appears 2 times, find the Mean of all 6 numbers!

Work:

Answer: _____

- 7** Big Ideas Method: Dot Plot Peak, Cluster & Gap
Find the Mean daily high temperature (°F): 68, 72, 75, 71, 64, 70.

Work:

Answer: _____

- 8** Big Ideas Method: Dot Plot Peak, Cluster & Gap
If 5 towers have a Mean height of 12 blocks, how many total blocks are in all 5 towers combined?

Work:

Answer: _____

- 9** Application & 2-Way Check: Missing Target Score via Total Sum
You need a Mean of 90 across 4 quizzes (360 pts). Your first 3 are 85, 92, 88. Find Quiz 4 score 2 ways!

Work:

Answer: _____

- 10** Application & 2-Way Check: Missing Target Score via Total Sum
6 players have a Mean score of 15 pts (90 pts). A 7th player scores 29 pts. What is the new Mean of all 7?

Work:

Answer: _____

Section 9.2: Median, Mode & Range — One Data Entry, Five Instant Answers!

Big Ideas Method: Ordering Data Least-to-Greatest for Median (Middle), Mode (Most Frequent), Range & Outlier Effect

Name: _____ Date: _____ Score: ____ / 10

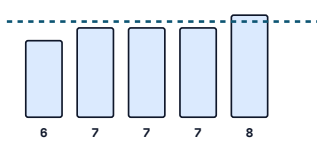
CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Normally, finding Median and Range requires sorting the list by hand first—and missing one number ruins the answer! On the SC-6, enter your numbers with [Σ+] in ANY order: the chip sorts them automatically and gives you Mean ([g] [x-bar]), Median ([f] [MED]), Mode ([g] [MODE]), and Range ([RNG]) in 1 click each!

BLOCK KIT & STEP-BY-STEP GUIDE (PROB-01: PROBABILITY & STATS STUDIO)



Fair-Share Mean = 7.5



HOW TO BUILD IT WITH PROB-01 (PROBABILITY & STATS STUDIO):

Step 1: Open Kit PROB-01 / COUNT-01 and line up the 8 shoe sizes in order from least to greatest: 6, 7, 7, 7, 8, 9, 9, 10.

Step 2: Find the middle pair (4th and 5th values: 7 and 8) and average them for the Median: $(7 + 8) \div 2 = 7.5$.

Step 3: Count the tallest frequency stack for the Mode (7 appears three times) and subtract $\text{Max} - \text{Min} = 10 - 6 = 4$ for Range.

WORKED EXAMPLE — EXAMPLE 1: ONE ENTRY, FIVE INSTANT STATS

Problem: For shoe sizes 7, 9, 6, 7, 10, 8, 9, 7, find Mean, Median, Mode, Min, Max, and Range.

Big Ideas Textbook Method (Ordering Data Least-to-Greatest for Median (Middle), Mode (Most Frequent), Range & Outlier Effect):

- Order data from least to greatest: 6, 7, 7, 7, 8, 9, 9, 10 ($n = 8$).
- Median (average of two middle values): $(7 + 8) \div 2 = 7.5$. Mode (most frequent): 7. Mean: $63 \div 8 = 7.875$.
- Range: $\text{Max} - \text{Min} = 10 - 6 = 4$ (when an extreme outlier is present, the Median is the best measure of center).

Block Connection (PROB-01): Clear ([g] [CLΣ]), enter all 8 numbers with [Σ+], then tap [g] [x-bar], [f] [MED], [g] [MODE], and [RNG]!

SC-6 Keystrokes:



Answer: Mean = 7.875, Median = 7.5, . . . You don't even have to sort the numbers before typin..

SECTION 9.2 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Ordering Data Least-to-Greatest for Median (Middle), Mode (Most..

1 Big Ideas Method: Ordered Median, Mode & Range

Load 4, 9, 2, 7, 8 into [Σ+]. Find the Median ([f] [MED]) and Range ([RNG]).

Work:

Answer: _____

2 Big Ideas Method: Ordered Median, Mode & Range

Load 12, 15, 12, 18, 20, 13 into [Σ+]. Find the Median, Mode ([g] [MODE]), and Range.

Work:

Answer: _____

3 Big Ideas Method: Ordered Median, Mode & Range

Find the Mean, Median, Mode, and Range of: 5, 8, 8, 10, 14.

Work:

Answer: _____

4 Big Ideas Method: Ordered Median, Mode & Range

Find the Minimum ([f] [MIN]), Maximum ([g] [MAX]), and Range ([RNG]) of: 23, 45, 19, 38, 51.

Work:

Answer: _____

5 Big Ideas Method: Even-Count Median & Outlier Impact

Even Count Median: Find the Median of the 6 test scores 70, 80, 84, 90, 92, 98.

Work:

Answer: _____

6 Big Ideas Method: Even-Count Median & Outlier Impact

Outlier Check: Earnings are \$15, \$18, \$15, \$20, \$17, \$90. Find Mean and Median. Which represents a typical day?

Work:

Answer: _____

7 Big Ideas Method: Even-Count Median & Outlier Impact

What happens to the Mean and Median of {10, 12, 14, 16, 18} if 18 changes to 100?

Work:

Answer: _____

8 Big Ideas Method: Even-Count Median & Outlier Impact

Mystery Range: The minimum score on a quiz is 64 and the Range is 31. What was the maximum score?

Work:

Answer: _____

9 Application & 2-Way Check: Choosing Best Measure of Center

Find Median and Range of {14, 8, 21, 11, 16} both by sorting tiles by hand AND with [f] [MED] & [RNG]!

Work:

Answer: _____

10 Application & 2-Way Check: Choosing Best Measure of Center

Home prices on a block (in \$1,000s): 210, 220, 215, 225, 980. Find Mean and Median—which should a buyer trust?

Work:

Answer: _____

Section 9.3: Quartiles, Interquartile Range ([IQR]) & Box-and-Whisker Plots

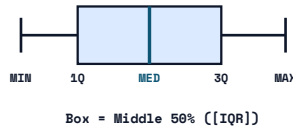
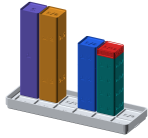
Big Ideas Method: 5-Number Summary (Min, Q1, Med, Q3, Max), Interquartile Range (IQR = Q3 - Q1) & Box-and-Whiske..

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

A Box-and-Whisker Plot splits your sorted data into 4 equal quarters (25% in each section, just like four 1/4 Fraction Studio blocks!). Once your data is in [Σ+], tap [f] [MIN], [f] [1Q], [f] [MED], [g] [3Q], [g] [MAX], and [IQR] (= 3Q - 1Q) to get the entire Box Plot in 5 seconds!

BLOCK KIT & STEP-BY-STEP GUIDE (FRAC-01: FRACTION & STATS STUDIO)



HOW TO BUILD IT WITH FRAC-01 (FRACTION & STATS STUDIO):

Step 1: Open Kit FRAC-01 / COUNT-01 and lay out the 9 ordered scores: 68, 72, 75, 78, [82], 85, 88, 92, 96.

Step 2: The middle (5th) score is Median = 82, splitting the remaining scores into a lower half of 4 and upper half of 4.

Step 3: Average the middle two of the lower half for Q1 = (72+75)/2 = 73.5 and upper half for Q3 = (88+92)/2 = 90 -> IQR = 90 - 73.5 = 16.5!

WORKED EXAMPLE — EXAMPLE 1: INSTANT 5-NUMBER SUMMARY & [IQR]

Problem: Find the 5-Number Summary and IQR of: 68, 72, 75, 78, 82, 85, 88, 92, 96.

Big Ideas Textbook Method (5-Number Summary (Min, Q1, Med, Q3, Max), Interquartile Range (IQR = Q..

1. Order the 9 values and identify Min = 68, Median (5th value) = 82, and Max = 96.
2. Find Q1 (median of lower 4 values: 68, 72, 75, 78) = 73.5, and Q3 (median of upper 4: 85, 88, 92, 96) = 90.
3. Compute Interquartile Range (middle 50% box width): IQR = Q3 - Q1 = 90 - 73.5 = 16.5.

Block Connection (FRAC-01): Load all 9 scores with [Σ+]. Read off [f] [MIN] (68), [f] [1Q] (73.5), [f] [MED] (82), [g] [3Q] (90), [g] [MAX] (96), and [IQR] (16.5)!

SC-6 Keystrokes:



Answer: Min=68, Q1=73.5, Med=82, Q3=90. Check: [g] [3Q] (90) minus [f] [1Q] (73.5) = 16.5 ([IQR]).

SECTION 9.3 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: 5-Number Summary (Min, Q1, Med, Q3, Max), Interquartile Range (..

- 1** Big Ideas Method: 5-Number Summary & Quartiles
Load 10, 20, 30, 40, 50 into [Σ+]. Record Min, Q1, Med, Q3, Max, and [IQR].

Work:

Answer: _____

- 2** Big Ideas Method: 5-Number Summary & Quartiles
Load 4, 6, 8, 10, 12, 14, 16 into [Σ+]. Find Q1, Median, Q3, and [IQR].

Work:

Answer: _____

- 3** Big Ideas Method: 5-Number Summary & Quartiles
If a box plot has Q1 = 24 and Q3 = 58, what is the Interquartile Range (IQR)?

Work:

Answer: _____

- 4** Big Ideas Method: 5-Number Summary & Quartiles
What percent of data in a Box Plot falls above Q1 (the 25th percentile)?

Work:

Answer: _____

- 5** Big Ideas Method: Interquartile Range (IQR = Q3 - Q1)
Find the 5-Number Summary and [IQR] of the 9 scores: 68, 72, 75, 78, 82, 85, 88, 92, 96.

Work:

Answer: _____

- 6** Big Ideas Method: Interquartile Range (IQR = Q3 - Q1)
Find Q1, Median, Q3, and [IQR] for the 8 speeds: 42, 45, 48, 50, 52, 55, 58, 60.

Work:

Answer: _____

- 7** Big Ideas Method: Interquartile Range (IQR = Q3 - Q1)
Consistency Check: Player A has IQR = 4 pts and Player B has IQR = 19 pts. Who is more consistent?

Work:

Answer: _____

- 8** Big Ideas Method: Interquartile Range (IQR = Q3 - Q1)
Outlier Rule (1.5 × IQR): If Q1 = 40, Q3 = 60 (IQR = 20), any score above Q3 + 1.5(IQR) is an outlier. Find that cutoff!

Work:

Answer: _____

- 9** Application & 2-Way Check: Box Plot 25% Quartile Sections
For {12, 15, 18, 22, 25, 28, 34}, find [IQR] both with the [IQR] key AND by subtracting [g] [3Q] - [f] [1Q]!

Work:

Answer: _____

- 10** Application & 2-Way Check: Box Plot 25% Quartile Sections
200 students take a test. The box plot has Min=50, Q1=70, Med=80, Q3=90, Max=100. How many students scored between 70 and 90?

Work:

Answer: _____

Section 9.4: Mean Absolute Deviation ([g] [MAD]) Without the 20-Minute Nightmare

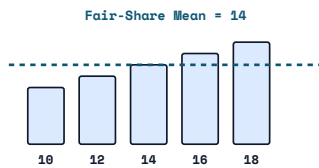
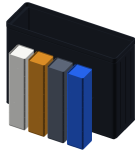
Big Ideas Method: Mean Absolute Deviation (MAD) — Average Distance of Data Values from the Mean

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Every 6th grader dreads Mean Absolute Deviation (MAD) because doing it by hand takes 15 steps: find the Mean, subtract the Mean from every number, take the absolute value ($|x|$), and average all the distances! On the SC-6, once your data is in $\Sigma+$, pressing [g] [MAD] ([g][$\Sigma+$]) computes the exact MAD in 1 click!

BLOCK KIT & STEP-BY-STEP GUIDE (COUNT-01: COUNTING & STATS STUDIO)



HOW TO BUILD IT WITH COUNT-01 (COUNTING & STATS STUDIO):

Step 1: Open Kit COUNT-01 (Counting & Array Tiles) and build towers for 10, 12, 14, 16, 18 with the Mean line at $\bar{x} = 14$.

Step 2: Measure each tower's distance $|x - 14|$ from the Mean line: 4, 2, 0, 2, and 4 tiles.

Step 3: Divide the total distance ($4 + 2 + 0 + 2 + 4 = 12$) by 5 towers to get $MAD = 12 \div 5 = 2.4$!

WORKED EXAMPLE — EXAMPLE 1: UNDERSTANDING & CHECKING MAD WITH [g] [MAD]

Problem: Find the Mean and Mean Absolute Deviation (MAD) of 10, 12, 14, 16, 18.

Big Ideas Textbook Method (Mean Absolute Deviation (MAD) — Average Distance of Data Values from..

1. Step 1 (Mean): Find the mean of 10, 12, 14, 16, 18 $\rightarrow \bar{x} = 70 \div 5 = 14$.

2. Step 2 (Absolute Deviations): Find each distance from 14: $|10-14|=4$, $|12-14|=2$, $|14-14|=0$, $|16-14|=2$, $|18-14|=4$.

3. Step 3 (Average of Distances): $MAD = (4 + 2 + 0 + 2 + 4) \div 5 = 12 \div 5 = 2.4$.

Block Connection (COUNT-01): Mean is 14. The distances $|x - 14|$ from the Mean are 4, 2, 0, 2, 4 (sum = 12). Average distance = $12 \div 5 = 2.4$! Confirm with [g] [MAD]!

SC-6 Keystrokes:



Answer: Mean = 14, MAD = 2.4

[g] [MAD] ([g][$\Sigma+$]) turns a 15-minute hand calculation..

SECTION 9.4 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Mean Absolute Deviation (MAD) — Average Distance of Data Values..

1 Big Ideas Method: 3-Step MAD Calculation

Load 2, 4, 6 into $\Sigma+$. Find the Mean ([g] $\bar{x}$) and MAD ([g] [MAD]).

Work:

Answer: _____

2 Big Ideas Method: 3-Step MAD Calculation

Load 10, 12, 14, 16, 18 into $\Sigma+$. Find the Mean and MAD.

Work:

Answer: _____

3 Big Ideas Method: 3-Step MAD Calculation

Load 5, 8, 8, 10, 14 into $\Sigma+$. Find the Mean and MAD.

Work:

Answer: _____

4 Big Ideas Method: 3-Step MAD Calculation

What is the MAD of 7, 7, 7, 7, 7 (5 identical towers)?

Work:

Answer: _____

5 Big Ideas Method: Deviation Distances from Mean

Find the Mean and MAD of: 20, 24, 28, 32, 36.

Work:

Answer: _____

6 Big Ideas Method: Deviation Distances from Mean

Find the Mean and MAD of the 6 sprint times: 12.4, 13.0, 12.6, 13.2, 12.8, 14.0.

Work:

Answer: _____

7 Big Ideas Method: Deviation Distances from Mean

Find the Mean and MAD of quiz scores: 82, 85, 88, 90, 95.

Work:

Answer: _____

8 Big Ideas Method: Deviation Distances from Mean

Team A has Mean = 50, MAD = 2.1. Team B has Mean = 50, MAD = 8.4. Which team's scores are more spread out?

Work:

Answer: _____

9 Application & 2-Way Check: Comparing MAD Consistency

For {6, 10, 11, 13}, find MAD both by averaging $|x - 10|$ distances AND with 1 click of [g] [MAD]!

Work:

Answer: _____

10 Application & 2-Way Check: Comparing MAD Consistency

Full Chapter 9 Boss Sweep: For {5, 8, 8, 10, 14}, record [g][$\bar{x}$], [f][MED], [g][MODE], [RNG], [IQR], and [g][MAD]!

Work:

Answer: _____

Section 10.1: Adding & Subtracting Signed Numbers — Why 'Minus a Negative' Adds!

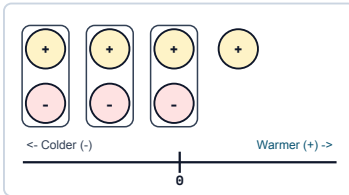
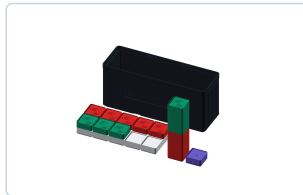
Big Ideas Method: Zero-Pair Counter Cancellation & Add-the-Opposite Rule for Subtraction ($a - b = a + (-b)$)

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

When adding with Yellow (+1) and Red (-1) counters: if signs are the SAME, they team up ($-6 + (-4) = -10$); if signs are OPPOSITE, they fight in Zero Pairs ($-8 + 5 = -3$)! And why does subtracting a negative like $10 - (-4)$ equal $+14$? Because erasing a -4 penalty makes your score go UP by 4!

BLOCK KIT & STEP-BY-STEP GUIDE (BASE-10: TEN-FRAME ZERO-PAIR COUNTERS)



HOW TO BUILD IT WITH BASE-10 (TEN-FRAME ZERO-PAIR COUNTERS):

Step 1: Open Kit BASE-10 (Ten-Frame Zero-Pair Counters) and place 8 red negative counters (-8) and 5 yellow positive counters (+5).

Step 2: Pair 5 red and 5 yellow counters into 5 Zero Pairs (each pair = 0) and remove them—3 red counters (-3) remain!

Step 3: For $-6 + (-4)$, both sets are red negative counters, so no zero pairs form: combine 6 red + 4 red = 10 red (-10).

WORKED EXAMPLE — EXAMPLE 1: ZERO-PAIR BATTLE ($-8 + 5$) VS. SAME-SIGN TEAM-UP (..

Problem: Evaluate $-8 + 5$ and $-6 + (-4)$ using counters and the SC-6 [+/-] key.

Big Ideas Textbook Method (Zero-Pair Counter Cancellation & Add-the-Opposite Rule for Subtraction (..

1. Different Signs ($-8 + 5$): Subtract absolute values ($8 - 5 = 3$) and keep the sign of the larger absolute value $\rightarrow -3$.
2. Same Signs ($-6 + (-4)$): Add absolute values ($6 + 4 = 10$) and keep the common sign $\rightarrow -10$.
3. Subtracting Signed Numbers ($a - b$): Add the opposite: $a + (-b)$ (so subtracting a negative adds a positive!).

Block Connection (BASE-10): $-8 + 5$ cancels 5 Zero Pairs, leaving 3 Red (-3). $-6 + (-4)$ combines 6 Red and 4 Red into 10 Red (-10)!

SC-6 Keystrokes:



Answer: $-8 + 5 = -3$; $-6 + (-4) = -10$ Always enter the number first, then tap [+/-] to make i..

SECTION 10.1 PRACTICE — WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Zero-Pair Counter Cancellation & Add-the-Opposite Rule for Subt..

1 Big Ideas Method: Zero-Pair Signed Addition

Solve side-by-side: (a) $-15 + 9$ and (b) $-15 + (-9)$.

Work:

Answer: _____

2 Big Ideas Method: Zero-Pair Signed Addition

Solve: $14 + (-23)$.

Work:

Answer: _____

3 Big Ideas Method: Zero-Pair Signed Addition

Taking Away a Penalty: Solve (a) $12 - (-8)$ and (b) $-12 - (-8)$.

Work:

Answer: _____

4 Big Ideas Method: Zero-Pair Signed Addition

Solve: $-9 - 16$. (Start at -9 and go 16 steps further negative!)

Work:

Answer: _____

5 Big Ideas Method: Add-the-Opposite Subtraction

Solve with decimals: $-4.8 + (-3.5)$.

Work:

Answer: _____

6 Big Ideas Method: Add-the-Opposite Subtraction

Solve with decimals: $6.4 - 11.2$.

Work:

Answer: _____

7 Big Ideas Method: Add-the-Opposite Subtraction

Solve with decimals: $-7.5 - (-10.2)$.

Work:

Answer: _____

8 Big Ideas Method: Add-the-Opposite Subtraction

Solve with signed fractions: $-3/4 - (-5/8)$.

Work:

Answer: _____

9 Application & 2-Way Check: Signed Fractions, Decimals & Change

Temperature in Fairbanks is -18°F at dawn and rises to $+7^\circ\text{F}$ by noon. Find the change ($7 - (-18)$) 2 ways!

Work:

Answer: _____

10 Application & 2-Way Check: Signed Fractions, Decimals & Change

Evaluate $-2\frac{1}{2} + 4\frac{1}{4} - (-1\frac{1}{8})$ on the SC-6 and check by converting to eighths!

Work:

Answer: _____

Section 10.2: Multiplying & Dividing Signed Rationals — The Light-Switch Flip Rule

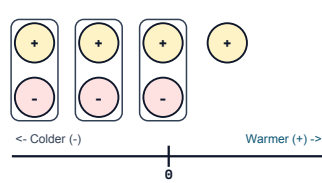
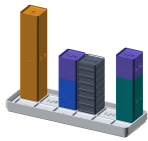
Big Ideas Method: Sign Rules for Multiplying & Dividing Rational Numbers (Same Signs = +, Different Signs = -)

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Think of a negative sign as flipping a light switch (just like tapping [+/-]!): 1 negative flip leaves you in the dark (-), but 2 negative flips bring you right back to POSITIVE (+)! And on the SC-6, 5 [+/-] [x^2] squares the entire number $(-5) \times (-5) = +25$ without needing parentheses!

BLOCK KIT & STEP-BY-STEP GUIDE (BASE-10: ZERO-PAIR & FRACTION STUDIO)



HOW TO BUILD IT WITH BASE-10 (ZERO-PAIR & FRACTION STUDIO):

- Step 1:** Open Kit BASE-10 (Ten-Frame Counters) and model $6 \times (-4)$ as 6 groups of 4 red negative counters = -24.
- Step 2:** Treat a negative multiplier as 'Flip the Sign': $(-6) \times (-4)$ flips the 24 red counters over to 24 yellow positive counters (+24).
- Step 3:** For $(-5)^2$, multiply $(-5) \times (-5) \rightarrow$ 2 negatives flip to positive +25!

WORKED EXAMPLE – EXAMPLE 1: THE 4 SIGN COMBINATIONS & $(-5)^2$

Problem: Compute $6 \times (-4)$, $(-6) \times (-4)$, and $(-5)^2$ on your SC-6.

Big Ideas Textbook Method (Sign Rules for Multiplying & Dividing Rational Numbers (Same Signs = +, ...

1. Different Signs $\rightarrow$ Negative (-): $6 \times (-4) = -24$.
2. Same Signs $\rightarrow$ Positive (+): $(-6) \times (-4) = +24$ and $(-5)^2 = (-5) \times (-5) = +25$.
3. Multi-Factor Sign Rule: An EVEN number of negative factors gives (+); an ODD number of negative factors gives (-).

Block Connection (BASE-10): 1 negative gives -24; 2 negatives flip back to +24! For $(-5)^2$, type 5 [+/-] [x^2] $\rightarrow$ +25!

SC-6 Keystrokes:

6 ENTER 4 +/- x 5 +/- x²

Answer: $6 \times (-4) = -24$, $(-6) \times (-4) = +24$. On algebraic calculators, typing -5^2 gives -25! On RP..

SECTION 10.2 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Sign Rules for Multiplying & Dividing Rational Numbers (Same Signs = +, Different Signs = -)

- 1** Big Ideas Method: Same/Different Sign Rules
Compute: (a) $7 \times (-8)$ and (b) $(-7) \times (-8)$.

Work:

Answer: _____

- 2** Big Ideas Method: Same/Different Sign Rules
Compute: (a) $-45 \div 9$ and (b) $-45 \div (-9)$.

Work:

Answer: _____

- 3** Big Ideas Method: Same/Different Sign Rules
Compute $(-5)^2$ using 5 [+/-] [x^2]. Why is it +25?

Work:

Answer: _____

- 4** Big Ideas Method: Same/Different Sign Rules
Compute $(-2)^3$ using 2 [+/-] [g] [x^3]. Why is a negative cubed still negative?

Work:

Answer: _____

- 5** Big Ideas Method: Signed Powers & Rational Products
Multiply signed decimals: $(-3.5) \times (-2.4)$.

Work:

Answer: _____

- 6** Big Ideas Method: Signed Powers & Rational Products
Divide signed decimals: $-14.4 \div 1.2$.

Work:

Answer: _____

- 7** Big Ideas Method: Signed Powers & Rational Products
Multiply signed fractions: $(-2/3) \times (9/10)$.

Work:

Answer: _____

- 8** Big Ideas Method: Signed Powers & Rational Products
Divide signed fractions: $-5/6 \div (-5/12)$.

Work:

Answer: _____

- 9** Application & 2-Way Check: Multi-Factor Sign Counting
Triple Product: Evaluate $(-4) \times (-5) \times (-3)$ both by counting negative signs AND on your SC-6!

Work:

Answer: _____

- 10** Application & 2-Way Check: Multi-Factor Sign Counting
A submarine dives 360 ft in 8 minutes (-45 ft/min). Confirm the total change in 8 min and the change per minute!

Work:

Answer: _____

Section 10.3: Solving Two-Step Equations ($ax + b = c$) — Unwrapping in Reverse!

Big Ideas Method: Solving Two-Step Equations ($ax + b = c$) by Undoing Addition/Subtraction First, Then Multiplication/..

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Think of $3x + 7 = 28$ like wrapping a present: first x was put into 3 boxes ($\times 3$), then 7 loose cubes were tied on outside ($+ 7$). When you unwrap the present, go in REVERSE: untie the loose cubes FIRST ($28 \text{ [ENTER] } 7 \text{ [-] } \rightarrow 21$), and divide by the 3 boxes SECOND ($3 \text{ [+]} \rightarrow x = 7$)!

BLOCK KIT & STEP-BY-STEP GUIDE (ALGB-01: ALGEBRA BOXES & STAGE)



Step 1: $28 - 7 = 21 \rightarrow$ Step 2: $21 \div 3 = 7$!

HOW TO BUILD IT WITH ALGB-01 (ALGEBRA BOXES & STAGE):

Step 1: Open Kit ALGB-01 (Algebra Boxes & Stage) and place 3 x-rods and 7 unit cubes on the Left Pan and 28 cubes on the Right Pan ($3x + 7 = 28$).

Step 2: Step 1 (Undo $+ 7$): Remove 7 unit cubes from BOTH pans so the 3 x-rods equal $28 - 7 = 21$ cubes ($3x = 21$).

Step 3: Step 2 (Undo $\times 3$): Divide the 21 cubes equally across the 3 x-rods: $21 \div 3 = 7$ cubes per x-rod ($x = 7$).

WORKED EXAMPLE – EXAMPLE 1: SOLVING $3x + 7 = 28$ WITH INVERSE OPERATIONS

Problem: Solve $3x + 7 = 28$ using inverse operations and check your solution.

Big Ideas Textbook Method (Solving Two-Step Equations ($ax + b = c$) by Undoing Addition/Subtraction..

- Step 1 (Undo Addition or Subtraction): Subtract 7 from both sides of $3x + 7 = 28 \rightarrow 3x = 21$.
- Step 2 (Undo Multiplication or Division): Divide both sides by 3 $\rightarrow x = 21 \div 3 = 7$.
- Check by substituting $x = 7$ back into the original equation: $3(7) + 7 = 21 + 7 = 28$.

Block Connection (ALGB-01): Step 1 (Clear loose cubes): $28 - 7 = 21$ (so $3x = 21$). Step 2 (Split across rods): $21 \div 3 = 7$! Check: $3(7) + 7 = 28$!

SC-6 Keystrokes:

28 ENTER 7 - 3 ÷

Answer: $x = 7$ (Step 1: $3x = 21$)

Step 1: Subtract 7 ($3x = 21$). Step 2: Divide by 3 ($x = 7$).

SECTION 10.3 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Solving Two-Step Equations ($ax + b = c$) by Undoing Addition/Sub..

- 1** Big Ideas Method: 2-Step Inverse Unwrapping
Solve $4x + 9 = 45$. Write the Step 1 value ($4x = ?$) and final x .

Work:

Answer: _____

- 2** Big Ideas Method: 2-Step Inverse Unwrapping
Solve $5x - 12 = 38$. (Undo -12 with $+$ first, then $\div 5$!)

Work:

Answer: _____

- 3** Big Ideas Method: 2-Step Inverse Unwrapping
Solve $6y + 11 = 59$.

Work:

Answer: _____

- 4** Big Ideas Method: 2-Step Inverse Unwrapping
Solve $8n - 15 = 49$.

Work:

Answer: _____

- 5** Big Ideas Method: Fractional & Negative Coefficients
Solve $m \div 4 + 6 = 15$. (Subtract 6 first, then multiply by 4!)

Work:

Answer: _____

- 6** Big Ideas Method: Fractional & Negative Coefficients
Solve $k \div 3 - 5 = 7$.

Work:

Answer: _____

- 7** Big Ideas Method: Fractional & Negative Coefficients
Solve $-3x + 14 = 2$.

Work:

Answer: _____

- 8** Big Ideas Method: Fractional & Negative Coefficients
Solve $2.5w + 8 = 23$.

Work:

Answer: _____

- 9** Application & 2-Way Check: 2-Step Word Problem Modeling
A repair tech charges \$35 flat plus \$25/hr ($25h + 35 = 160$). Find hours h by unwrapping AND plug-in check!

Work:

Answer: _____

- 10** Application & 2-Way Check: 2-Step Word Problem Modeling
You save \$15/week toward a \$120 skateboard and already have \$45 ($15w + 45 = 120$). How many weeks w ?

Work:

Answer: _____

Section 10.4: Probability, Combinatorics & Graduation Quiz Sprint ([DICE], [x!], [f] [nCr], [f] [?])

Big Ideas Method: Theoretical Probability $P(E) = \text{Favorable} / \text{Total}$, Complement $P(\text{not } E)$, Factorials ($n!$) & Combination..

Name: _____ Date: _____ Score: ____ / 10

CONCEPT SUMMARY & TEXTBOOK CONNECTION:

Probability is Favorable Outcomes $\div$ Total Outcomes—and you can express it as a Fraction, Decimal, or Percent! Plus, the top-left keys of your SC-6 unlock Combinatorics: [x!] ([g][DICE]) for arrangements of all n items, [g] [nPr] when order matters (1st/2nd/3rd podium), [f] [nCr] when order does NOT matter (pizza toppings), and [f] [?] ([f][C]) for the built-in Math Quiz Engine!

BLOCK KIT & STEP-BY-STEP GUIDE (PROB-01: PROBABILITY DICE & SPINNER STUD..)



[DICE] • [x!] • [f] [nCr] • [g] [nPr]

HOW TO BUILD IT WITH PROB-01 (PROBABILITY DICE & SPINNER STUDIO):

Step 1: Open Kit PROB-01 (Probability Studio) and inspect the 10-sector spinner (4 Blue, 3 Gold, 3 Red sectors).

Step 2: Count the 4 favorable Blue sectors out of 10 total sectors: $P(\text{Blue}) = 4/10 = 2/5 = 0.4 = 40\%$.

Step 3: Line up 5 physical blocks to count permutations: 5 choices for spot $1 \times 4 \times 3 \times 2 \times 1 = 5!$ = 120 ways!

WORKED EXAMPLE – EXAMPLE 1: 3-WAY PROBABILITY & FACTORIAL ([x!])

Problem: A 10-sector spinner has 4 Blue, 3 Gold, and 3 Red sectors. Find $P(\text{Blue})$ in 3 forms, and find how many ways to line up 5 trophies (5!).

Big Ideas Textbook Method (Theoretical Probability $P(E) = \text{Favorable} / \text{Total}$, Complement $P(\text{not } E)$, Fac..

1. Theoretical Probability: $P(\text{Blue}) = \text{Favorable} / \text{Total} = 4/10 = 2/5$ (simplified fraction) = 0.4 (decimal) = 40% (percent).
2. Permutations of n items (order matters): $n! = 5 \times 4 \times 3 \times 2 \times 1 = 120$ ways (or nPr for choosing r in order).
3. Combinations (order does NOT matter, like choosing a team): use nCr .

Block Connection (PROB-01): $P(\text{Blue}) = 4/10 = 2/5 = 0.40 = 40\%$. For 5 trophies: press 5 [g] [x!] ([g][DICE]) $\rightarrow$ 120 ways!

SC-6 Keystrokes:

[.] [4] [.] [10] [g] [SIMP] [5] [g] [x!]

Answer: $P(\text{Blue}) = 2/5 = 0.4 = 40\%$; 5..

5! means $5 \times 4 \times 3 \times 2 \times 1 = 120!$

SECTION 10.4 PRACTICE – WORK OUT EACH PROBLEM & WRITE YOUR ANSWER

Method Focus: Theoretical Probability $P(E) = \text{Favorable} / \text{Total}$, Complement $P(\text{not } E)$.

1 Big Ideas Method: Theoretical Probability & Complement

Roll a fair 6-sided die. Find $P(\text{rolling a 5})$ as a fraction, and $P(\text{rolling an even number})$ in simplest form.

Work:

Answer: _____

2 Big Ideas Method: Theoretical Probability & Complement

A 10-sector spinner has 4 Blue, 3 Gold, 3 Red. Find $P(\text{Blue})$ as a simplified fraction, decimal, and percent.

Work:

Answer: _____

3 Big Ideas Method: Theoretical Probability & Complement

Using the same 10-sector spinner, find $P(\text{NOT Red})$ as a fraction and percent.

Work:

Answer: _____

4 Big Ideas Method: Theoretical Probability & Complement

In how many ways can 4 students line up at the door? Compute 4! using [g] [x!].

Work:

Answer: _____

5 Big Ideas Method: Factorials ($n!$) & Permutations (nPr)

In how many ways can you arrange 6 books on a shelf? Compute 6! using [g] [x!].

Work:

Answer: _____

6 Big Ideas Method: Factorials ($n!$) & Permutations (nPr)

How many ways can you choose a 3-person team from 8 players (order does NOT matter: [f] [nCr])?

Work:

Answer: _____

7 Big Ideas Method: Factorials ($n!$) & Permutations (nPr)

How many ways can 1st, 2nd, and 3rd place be awarded among 8 finalists (order DOES matter: [g] [nPr])?

Work:

Answer: _____

8 Big Ideas Method: Factorials ($n!$) & Permutations (nPr)

Two Independent Events: You flip a coin (1/2) AND roll a 6-sided die ($P(>4) = 2/6 = 1/3$). Multiply to find $P(\text{Heads and } >4)$!

Work:

Answer: _____

9 Application & 2-Way Check: Combinations (nCr) vs. Permutations

From 10 toppings, compare choosing 3 toppings ([f] [nCr]) vs. 3 ordered medals ([g] [nPr]). How are they related by 3?

Work:

Answer: _____

10 Application & 2-Way Check: Combinations (nCr) vs. Permutations

GRADUATION BOSS: Compute 5! both with [g] [x!] AND 5 [ENTER] 5 [g] [nPr], then complete a 5-streak on [f] [?].

Work:

Answer: _____