

Second Grade Math — Answer Key

D/A/P/E Mastery Scale:

D (Developing): 0-59% — Needs significant support A (Approaching): 60-74% — Progressing toward mastery
P (Proficient): 75-89% — Meets grade-level standard E (Exemplary): 90-100% — Exceeds expectations

Part A: Measure and Record (6 items)

Answers vary — accept measurements within +/- 0.5 inch of actual length.

Pencil: typically 7 inches; Eraser: typically 2 inches; Paperclip: typically 1 inch

Thumb: typically 2 inches; Crayon: typically 3-4 inches; Shoe: typically 8-10 inches

Teaching Note: Verify students use the zero mark (not the edge) of the ruler as the starting point.

Part B: Create a Line Plot

Check that: (1) Each measurement has an X above the correct number

(2) The number line is labeled 'Length in Inches'

(3) X marks are stacked neatly above each value

D: Missing X marks or wrong placement A: Most correct but messy alignment

P: All X marks correct and neatly placed E: Includes a title and clear labels

Part C: Analyze Your Data (5 questions)

1. Most common measurement: the value with the most X marks (mode)

2. Longest object: the rightmost X on the line plot

3. Shortest object: the leftmost X on the line plot

4. Difference: longest - shortest (subtraction within 20)

5. Objects longer than 4 inches: count X marks at 5, 6, 7, 8+

Part D: Read a Line Plot (5 questions)

Data: 1 in→2 leaves, 2 in→4 leaves, 3 in→5 leaves, 4 in→3 leaves, 5 in→1 leaf

1. Total leaves = $2+4+5+3+1 = 15$ leaves
2. Most common length = 3 inches (5 leaves)
3. 3-inch vs 5-inch: $5 - 1 = 4$ more leaves at 3 inches
4. Shorter than 3 inches: $2+4 = 6$ leaves (at 1 and 2 inches)
5. All 2-inch leaves end to end: $4 \times 2 = 8$ inches

Teaching Note: Students should count X marks carefully — remind them each X = 1 leaf.

Part E: Create Your Own Line Plot

Answers vary. Check for: (1) 10 data points collected

(2) X marks correctly placed on number line 0-6

(3) Number line is labeled 'Number of Pets'

(4) Title included

Standards Alignment

2.MD.D.9 — Generate measurement data by measuring lengths; show data on line plot

2.MD.A.1 — Measure the length of an object by selecting appropriate tools

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Part A: Read the Picture Graph (5 questions)

Key: Each circle = 2 students

Apples: 6 circles $\times 2 = 12$ students

Bananas: 4 circles $\times 2 = 8$ students

Grapes: 3 circles $\times 2 = 6$ students

Oranges: 5 circles $\times 2 = 10$ students

1. Apples = 12 students 2. Bananas = 8 students
3. Most chosen = Apples (12) 4. Oranges - Grapes = $10 - 6 = 4$ more
5. Total = $12 + 8 + 6 + 10 = 36$ students

Teaching Note: Common error: forgetting to multiply by 2 (each picture = 2 students).

Part B: Create a Picture Graph

Answers vary. Check for: (1) Consistent symbol use

(2) Key clearly states what each symbol represents

(3) Categories labeled correctly (Spring, Summer, Fall, Winter)

(4) Data matches collected survey responses

Part C: Read the Bar Graph (5 questions)

Data: Ali=8, Ben=12, Cat=6, Dee=10

1. Most books = Ben (12 books)
2. Cat read 6 books
3. Ben - Cat = $12 - 6 = 6$ more books
4. Ali + Dee = $8 + 10 = 18$ books
5. Total = $8+12+6+10 = 36$ books

Part D: Draw Your Own Bar Graph

Data: Swings=8, Slide=5, Tag=10, Jump Rope=7

Check that: (1) Bars reach correct heights on scale

(2) All 4 categories labeled on x-axis

(3) Y-axis has consistent number scale

(4) Title 'Favorite Recess Activities' included

D: Bars incorrect height or missing labels A: Most bars correct, some labeling issues

P: All bars correct with labels E: Includes title, neat presentation, color-coded

Standards Alignment

2.MD.D.10 — Draw a picture graph and bar graph to represent data with up to four categories

2.MD.D.10 — Solve simple put-together, take-apart, and compare problems using bar graphs

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Part A: Identify the Shape (4 items)

1. 3 sides, 3 corners → triangle
2. 4 sides, 4 corners → quadrilateral (also accept: rectangle, square, rhombus)
3. 5 sides, 5 corners → pentagon
4. 6 sides, 6 corners → hexagon

Part B: Draw the Shapes

Triangle: any closed 3-sided figure with 3 vertices

Quadrilateral: any closed 4-sided figure (square, rectangle, trapezoid, etc.)

Pentagon: any closed 5-sided figure with 5 vertices

Hexagon: any closed 6-sided figure with 6 vertices

D: Shapes open or wrong # of sides A: Closed but irregular/messy

P: Correct # of sides, closed figures E: Neat, labeled, includes multiple examples

Teaching Note: Shapes do NOT need to be regular — irregular pentagons and hexagons are correct.

Part C: Shape Attributes Table

Triangle: 3 sides, 3 vertices, right angles = sometimes (right triangle)

Square: 4 sides, 4 vertices, right angles = Yes (4 right angles)

Rectangle: 4 sides, 4 vertices, right angles = Yes (4 right angles)

Pentagon: 5 sides, 5 vertices, right angles = sometimes

Hexagon: 6 sides, 6 vertices, right angles = sometimes

Part D: Shapes Around Us

Triangles: yield sign, pizza slice, tent, coat hanger, doritos chip, roof peak

Quadrilaterals: window, book, door, TV screen, table top, whiteboard, sticky note

Pentagons: home plate (baseball), some star patterns, building cross-sections

Hexagons: honeycomb, hex nut/bolt, some floor tiles, snowflake patterns

Accept any real-world object that genuinely has the correct number of sides.

Teaching Note: Encourage students to look around the room for examples — math is everywhere!

Common Errors to Watch For

- Confusing quadrilateral with rectangle (all rectangles are quadrilaterals, not vice versa)
- Counting corners instead of sides (they should be the same for polygons)
- Drawing open figures instead of closed shapes
- Thinking all shapes must be 'regular' (equal sides and angles)

Standards Alignment

2.G.A.1 — Recognize and draw shapes having specified attributes (sides, angles)

2.G.A.1 — Identify triangles, quadrilaterals, pentagons, hexagons, and cubes

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Part A: Partition into Rows and Columns (4 items)

1. 2 rows, 3 columns → Total squares = 6 Equation: $2 \times 3 = 6$
2. 3 rows, 4 columns → Total squares = 12 Equation: $3 \times 4 = 12$
3. 4 rows, 5 columns → Total squares = 20 Equation: $4 \times 5 = 20$
4. 2 rows, 6 columns → Total squares = 12 Equation: $2 \times 6 = 12$

Teaching Note: Squares must be equal size — check that lines are evenly spaced.

Part B: Repeated Addition from Arrays (4 items)

1. 3 rows of 5: $5 + 5 + 5 = 15$
2. 4 rows of 3: $3 + 3 + 3 + 3 = 12$
3. 2 rows of 7: $7 + 7 = 14$
4. 5 rows of 2: $2 + 2 + 2 + 2 + 2 = 10$

Teaching Note: Each addend = number of columns; number of addends = number of rows.

Part C: Real-World Partitioning (3 problems)

1. Garden: 3 rows x 6 plants = 18 plants (drawing shows 3x6 grid)
2. Chocolate bar: 4 rows x 5 pieces = 20 pieces (drawing shows 4x5 grid)
3. Classroom: 5 rows x 4 desks = 20 desks (drawing shows 5x4 grid)

Part D: Challenge — Design Your Own Array

Answers vary. Check for:

- (1) Real-world context (eggs in a carton, tiles on a floor, seats in a theater)
- (2) Correct rectangular array drawing with equal squares
- (3) Matching multiplication equation (rows x columns = total)
- (4) Correct answer matching the equation

D: No context or incorrect equation A: Context present but equation/drawing errors

P: Context, correct drawing, and equation E: Creative context with explanation of thinking

Common Errors to Watch For

- Confusing rows (horizontal) with columns (vertical)
- Drawing unequal squares in the partition
- Writing the wrong number of addends in repeated addition
- Counting individual lines instead of squares

Standards Alignment

- 2.G.A.2 — Partition a rectangle into rows and columns of same-size squares; count total
- 2.OA.C.4 — Use addition to find the total number of objects in rectangular arrays