

Houghton Mifflin Math Expressions
Grade 4
 correlated to
Illinois Mathematics Assessment Framework

| Illinois Mathematics Assessment Framework | <i>Houghton Mifflin Math Expressions</i> |
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| STATE GOAL 6: NUMBER SENSE | |
| Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions. | |
| Calculators Allowed | |
| Standard 6A – Representations and Ordering | |
| Demonstrate knowledge and use of numbers and their representations in a broad range of theoretical and practical settings. | |
| Read, Write, and Represent Numbers | |
| 6.4.01 Read, write, recognize, and model equivalent representations of whole numbers and their place values up to 1,000,000. | SAB: 145, 151, 152 TG: 291, 292–294, 301, 309, 310–312, 317 H/R: 95 |
| 6.4.02 Identify and write (in words and standard form) whole numbers up to 1,000,000. | SAB: 145, 146, 151, 152 TG: 294, 298, 301, 309, 310–312, 315, 317 H/R: 95, 99 |
| 6.4.03 Read, write, recognize, and model equivalent representations of fractions; divide regions or sets to represent a fraction. | SAB: 311, 312, 313, 317, 318, 324 TG: 715–716, 717–718, 719–720, 721, 723–724, 726, 727, 741–742, 743 H/R: 195, 197, 201 |
| 6.4.04 Represent multiplication as repeated addition. | SAB: 6 TG: 1H, 13, 19, 69 H/R: 3 |
| Order and Compare Numbers | |
| 6.4.05 Order and compare whole numbers up to 100,000. | SAB: 147, 149 TG: 164, 289, 291, 301, 302–303, 304–305, 307, 308, 309, 317, 387 |
| 6.4.06 Order and compare decimals through hundredths. | SAB: 394, 395, 396 TG: 889, 897, 908, 909, 911 H/R: 239, 245 |
| 6.4.07 Order and compare fractions having like denominators with or without models. | SAB: 320, 335, 395 TG: 735, 736, 737, 761, 769, 770, 909 H/R: 199 |
| Number Line | |
| 6.4.08 Identify and locate whole numbers, halves, and fourths on a number line. | SAB: 365 TG: 838, 839–840 |
| Classifications of Numbers | |
| 6.4.09 Solve problems involving descriptions of numbers, including characteristics and relationships (e.g., odd/even, factors/multiples, greater than, less than). | SAB: 53, 65, 82, 83, 122, 150, 207, 211 TG: 9, 16, 41, 60, 62–63, 108, 130, 168–169, 170, 171, 243, 306, 443, 448, 451 H/R: 13, 65 |

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| Standards 6B, 6C – Computation, Operations, Estimation, and Properties | |
| 6B: Investigate, represent and solve problems using number facts, operations (addition, subtraction, multiplication, division) and their properties, algorithms and relationships. | |
| 6C: Compute and estimate using mental mathematics, paper-and-pencil methods, calculators and computers. | |
| Number Operations | |
| 6.4.10 Solve problems and number sentences involving addition and subtraction with regrouping and multiplication (up to three-digit by one-digit). | SAB: 8, 15, 40, 60, 68, 131, 134, 136, 168, 216, 226 TG: 16–17, 31, 86, 123, 136, 264, 270, 278, 360, 458, 488 H/R: 3, 11, 27, 31, 33, 55, 107, 111, 113, 135, 141, 143 |
| 6.4.11 Solve problems involving the value of a collection of bills and coins whose total value is \$100.00 or less, and make change. | SAB: 156, 168, 270 TG: 244, 271, 324, 360, 612, 655 |
| 6.4.12 Model and apply basic multiplication and division facts (up to 12×12), and apply them to related multiples of 10 (e.g., $3 \times 9 = 27$, $30 \times 9 = 270$, $6 \div 3 = 2$, $600 \div 3 = 200$). | SAB: 9, 15, 17, 27, 28, 29, 35, 36, 39, 40, 41, 42 TG: 4, 5–6, 7–8, 9, 17, 28, 29, 31, 33, 36, 37–38, 39, 41, 44, 46, 55, 58–59, 60, 63, 73, 74, 77, 84, 86, 87 H/R: 13, 21 |
| 6.4.13 Model situations involving addition and subtraction of fractions with like denominators. | TG: 761–762, 767 |
| Properties | |
| 6.4.14 Solve problems involving the commutative and distributive properties of operations on whole numbers [e.g., $8 + 7 = 7 + 8$, $27 \times 5 = (20 \times 5) + (7 \times 5)$]. | SAB: 7, 43, 45, 104, 120, 121, 206 TG: 14, 59–60, 63, 93, 98, 100–101, 103, 104, 239, 240–241, 441, 442, 471, 549, 829 |
| 6.4.15 Use the inverse relationships between addition/subtraction and multiplication/division to complete basic fact sentences and solve problems (e.g., $4 \times 3 = 12$, $12 \div 3 = \underline{\quad}$). | SAB: 27, 121, 165 TG: 58, 59–60, 63, 240–241, 348–349, 352, 353 H/R: 109 |
| Estimation | |
| 6.4.16 Make estimates appropriate to a given situation with whole numbers. | SAB: 159, 160, 174, 175, 176, 217, 218, 229 TG: 334–335, 336–337, 381, 382, 384, 465–466, 467, 497–499, 501, 533–534 H/R: 105, 117 |
| Standard 6D – Ratios, Proportions, and Percents | |
| Solve problems using comparison of quantities, ratios, proportions and percents. | |
| Identify and Express Ratios | |
| No benchmark expectations at this grade level. | |
| Proportional Reasoning | |
| No benchmark expectations at this grade level. | |

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| Percents | |
| No benchmark expectations at this grade level. | |
| STATE GOAL 7 MEASUREMENT: | |
| Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy. | |
| Calculators Allowed | |
| Standards 7A, 7B, 7C – Units, Tools, Estimation, and Applications | |
| 7A: Measure and compare quantities using appropriate units, instruments and methods. | |
| 7B: Estimate measurements and determine acceptable levels of accuracy. | |
| 7C: Select and use appropriate technology, instruments and formulas to solve problems, interpret results and communicate findings. | |
| Elapsed Time | |
| 7.4.01 Solve problems involving elapsed time in compound units (e.g., 1 hour and 40 minutes) that occur in the same half day (a.m. only or p.m. only). | SAB: 306, 307 TG: 353, 697, 698–699 H/R: 193 |
| Measurement Tools | |
| 7.4.02 Select and use appropriate standard units and tools to measure length (to the nearest 1/2 inch or 1/2 cm), time, and temperature. | SAB: 249, 251, 412 TG: 568, 596, 950, 951, 953 H/R: 257 |
| Area, Perimeter, and Circumference | |
| 7.4.03 Solve problems involving the perimeter of a polygon with given side lengths and the area of a square, rectangle, or irregular shape composed of rectangles using diagrams, models, and grids or by measuring (may include sketching a figure from its description). | SAB: 102, 103, 104, 109, 110, 111, 112, 199, 200, 201, 202 TG: 201–202, 203, 214, 215–216, 217, 422, 423–424, 425–426, 680, 687 H/R: 73, 77 |
| Estimation | |
| 7.4.04 Compare and estimate length (including perimeter), area, volume, and weight/mass using referents. | SAB: 413 TG: 567, 569, 951, 965, 980, 983 |
| Volume and Surface Area | |
| 7.4.05 Determine the volume of a solid figure that shows cubic units. | SAB: 418 TG: 957 H/R: 259 |
| Measurement Conversions | |
| 7.4.06 Solve problems involving unit conversions within the same measurement system for time, length, and weight/mass. | SAB: 255, 259, 260 TG: 572–573, 577, 583–584, 586, 948, 953 H/R: 165 |
| Indirect Measurements and Scale Drawings | |
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| STATE GOAL 8: ALGEBRA: Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results. | |
| Calculators Allowed | |
| Standard 8A – Representations, Patterns, and Expressions Describe numerical relationships using variables and patterns. | |
| Patterns | |
| 8.4.01 Determine a missing term in a pattern (sequence), describe a pattern (sequence), and extend a pattern (sequence) when given a description or pattern (sequence). | SAB: 41, 58, 276 TG: 4–5, 7–9, 28, 33, 36, 41, 48, 49, 72–73, 76, 77, 80–81, 83, 90, 91–92, 93–94, 95, 118, 432, 433, 461, 469, 475, 481, 483, 491, 503, 509, 515, 545, 551, 557, 623, 630, 897 |
| Write and Simplify Expressions | |
| 8.4.02 Write an expression using letters or symbols to represent an unknown quantity. | TG: 67, 68, 69, 71, 126, 129, 130, 131, 133, 134, 135–136, 140–141, 252, 255, 257, 260–261, 263–264, 267–268, 270 H/R: 83, 85, 87 |
| Evaluate Algebraic Expressions | |
| 8.4.03 Evaluate algebraic expressions with a whole number variable value (e.g., evaluate $3 + m$ when $m = 4$). | SAB: 43, 44, 45, 46 TG: 98–99, 100–101, 102–103 H/R: 35 |
| Standard 8B – Connections Using Tables, Graphs, and Symbols Interpret and describe numerical relationships using tables, graphs and symbols. | |
| Describing Change | |
| 8.4.04 Identify or represent situations with well-defined patterns using words, tables, and graphs (e.g., represent temperature and time in a line graph). | SAB: 36, 58, 308 TG: 25, 76, 77, 118, 131, 157, 433, 598, 700 |
| Coordinate System | |
| No benchmark expectations at this grade level. | |
| Representations | |
| 8.4.05 Translate between different representations (table, written, or pictorial) of whole number relationships. | SAB: 36, 58, 75, 308 TG: 25, 76, 77, 118, 131, 149, 157, 433, 700, 921 H/R: 49, 59 |
| Inequalities | |
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| Standard 8C, 8D – Writing, Interpreting, and Solving Equations | |
| 8C: Solve problems using systems of numbers and their properties. | |
| 8D: Use algebraic concepts and procedures to represent and solve problems. | |
| Write Equations and Inequalities | |
| 8.4.06 Represent simple mathematical relationships with number sentences (equations and inequalities). | SAB: 44, 54, 122 TG: 99, 110, 242, 265, 301, 309, 341, 347, 363, 387 |
| Solve Equations and Inequalities | |
| 8.4.07 Solve for the unknown in an equation with one operation (e.g., $10 = _ + 3 + 2$, $_ - 1 = 3$). | SAB: 58 TG: 9, 253, 259, 267, 281, 353, 447, 453 |
| 8.4.08 Solve word problems involving unknown quantities. | Representative Pages: SAB: 15, 33, 40, 60, 79, 80, 123, 126, 127, 134, 135, 136, 168, 178, 226, 240, 241 TG: 31, 66, 69, 86, 123, 160, 162, 246–249, 251, 254–255, 270, 274, 278, 360, 390, 488, 536, 543 H/R: 1, 3, 11, 17, 27, 29, 31, 33, 49, 55, 63, 83, 85, 87, 89, 91, 111, 113, 141, 151, 155, 157 |
| STATE GOAL 9: GEOMETRY | |
| Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space. | |
| Calculators Allowed | |
| Standard 9A – Properties of Single Figures and Coordinate Geometry | |
| Demonstrate and apply geometric concepts involving points, lines, planes and space. | |
| Properties of Single Figures | |
| 9.4.01 Identify, describe, and sketch two-dimensional shapes (triangles, quadrilaterals, pentagons, hexagons, and octagons) according to the number of sides, length of sides, number of vertices, and right angles. | SAB: 97, 98, 189, 190, 191, 192, 193 TG: 192, 193–194, 195, 196, 406–407, 408, 409, 410, 411 |
| 9.4.02 Identify and describe three-dimensional shapes (cubes, spheres, cones, cylinders, prisms, and pyramids) according to their characteristics (faces, edges, vertices). | SAB: 379, 380 TG: 870, 871, 873 |
| 9.4.03 Differentiate between polygons and non-polygons | SAB: 293 TG: 676 |
| Circles | |
| No benchmark expectations at this grade level. | |
| Coordinate Geometry | |
| 9.4.04 Graph, locate, identify points, and describe paths using ordered pairs (first quadrant). | TG: 706–707 |
| Symmetry | |
| 9.4.05 Identify whether or not a figure has one or more | SAB: 89 |

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| lines of symmetry, and sketch or identify all lines of symmetry. | TG: 180, 181, 681 |

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| Transformations | |
| 9.4.06 Identify images resulting from flips (reflections), slides (translations), or turns (rotations). | SAB: 90, 186 TG: 182, 402, 431, 681 |
| Lines, Segments, Rays, and Angles | |
| 9.4.07 Identify and sketch parallel and perpendicular lines. | SAB: 93, 94 TG: 186, 189 |
| 9.4.08 Identify and sketch right angles. | SAB: 94, 182, 183, 189, 190 TG: 186, 399–400, 406–407 |
| Standard 9B – Relationships Between and Among Multiple Figures Identify, describe, classify and compare relationships using points, lines, planes and solids. | |
| Relationships Between Two- and Three-Dimensional Objects | |
| 9.4.09 Identify the two-dimensional components of a three-dimensional object. | SAB: 372, 378 TG: 856–857, 859, 866, 867 |
| 9.4.10 Identify a three-dimensional object from its net. | SAB: 378 TG: 859, 868 |
| Composing and Decomposing Figures | |
| 9.4.11 Predict the result of composing or decomposing shapes or figures. | SAB: 109, 110, 111, 195, 196, 197 TG: 214, 215, 216, 219, 414–415, 416–417, 419 H/R: 125 |
| Congruency and Similarity | |
| 9.4.12 Identify congruent and similar figures by visual inspection. | SAB: 87, 88, 97 TG: 178–179, 181, 183, 192 H/R: 67 |
| Distance | |
| 9.4.13 Determine the distance between two points on the number line in whole numbers | TG: 149, 304–305 |
| Standard 9C – Justifications of Conjectures and Conclusions Construct convincing arguments and proofs to solve problems. | |
| <i>This standard is not assessed in isolation. Rather, its essence is assessed indirectly through problems that require this type of thinking.</i> | |
| Standard 9D – Trigonometry Use trigonometric ratios and circular functions to solve problems. | |
| <i>This standard is not assessed on the state assessment until grade 11.</i> | |

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| STATE GOAL 10: DATA ANALYSIS, STATISTICS, AND PROBABILITY | |
| Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty-using concepts of probability. | |
| Calculators Allowed | |
| Standards 10A, 10B – Data Analysis and Statistics | |
| 10A: Organize, describe and make predictions from existing data. | |
| 10B: Formulate questions, design data collection methods, gather and analyze data and communicate findings. | |
| Read and Interpret Displays | |
| 10.4.01 Read and interpret data represented in a pictograph, bar graph, line (dot) plot, Venn diagram (with two circles), tally chart, table, line graph, or circle graph. | SAB: 16, 69, 73, 74, 194, 262, 302, 303, 304 TG: 32, 140, 141, 146–148, 152, 279, 307, 410, 589, 691, 692 H/R: 59, 169, 191 |
| Complete and Create Displays | |
| 10.4.02 Create a pictograph, bar graph, tally chart, or table for a given set of data. | SAB: 69, 71, 75 TG: 87, 143, 149, 151, 152, 598, 693, 704, 705, 708 H/R: 59 |
| Line of Best Fit | |
| No benchmark expectations at this grade level. | |
| Statistics | |
| 10.4.03 Determine the mode and range, given a set of data or a graph. | SAB: 76, 289, 290 TG: 150, 304, 307, 667–668 |
| Standard 10C – Probability | |
| Determine, describe and apply the probabilities of events. | |
| Probability | |
| 10.4.04 Classify events using words such as certain, most likely, equally likely, least likely, possible, and impossible. | SAB: 351 TG: 800–802, 803, 808, 809 H/R: 217 |
| 10.4.05 Describe the chances associated with a context presented visually, including using the response format “3 out of 4” or $\frac{3}{4}$. | SAB: 352 TG: 803, 804, 805 H/R: 217 |
| Outcomes and Counting Principles | |
| No benchmark expectations at this grade level. | |