

Houghton Mifflin *MATHSTEPS*
 Level 6
 correlated to
 Chicago Academic Standards and Framework
 Grade 6

Curriculum Framework Statement

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State Goal 6: <i>Demonstrate and apply a knowledge and sense of numbers, including basic arithmetic operations, number patterns, ratios and proportions.</i>	
CAS A. Describe, express, and represent whole numbers, proper and improper fractions, and decimal and the relationships among them using concrete materials, drawings, words, and mathematical symbols.	
1. Read, write, and interpret whole numbers expressed in standard form, word form, and exponential form through the trillions–place; name each number family and give the value of any digit.	These pages involve whole numbers to billions. TE: T16–20 PE: 3–4
2. Identify powers and exponents (e.g., $10^2=10 \times 10=100$).	TE: T44–47, T49 PE: 71–72
3. Read, write, and identify decimals.	TE: T34 PE: 39–40
4. Demonstrate writing a set of equivalent fractions, using a fractional form of 1.	TE: T44–47, T51 PE: 81–82
5. Describe and formulate problem situations involving ratios, proportions, and/or percents.	TE: T90–93, T95, T97 PE: 159–161, 167–168, 153–154, 157, 168, 170–172, 175, 177–178
6. Recognize and demonstrate relationships among simple fractions, decimals, and percents (e.g., $1/2$ is the same as .5 and 50%).	TE: T90–93, T97 PE: 169–170
7. Write terminating decimals as fractions and fraction as repeating or terminating decimals.	TE: T44–47, T53 PE: 89–90
CAS B. Compare, order, and graph integers, fractions, and decimals, using concrete materials, drawings, and mathematical symbols.	
1. Compare (using $<$, $>$, $=$) and order quantities expressed as whole numbers, fractions, decimals, and negative numbers.	TE: T30–34, T44–47, 52, T148–152 PE: 41–42, 85–86, 269–270
2. Describe data using ratios and appropriate notations (g/b, g to b, g:b).	TE: T90–94 PE: 153–154
3. Identify a fraction, decimal, or integer which lies between two given numbers.	TE: T30–34 PE: 41–42, 267–268
4. Identify and represent integers, decimals, and fractions on a number line.	TE: T148–152 PE: 41, 81, 83, 85, 267–268
5. Accurately plot positive and negative integers on a number line.	TE: T152 PE: 267–269

Houghton Mifflin *MATHSTEPS*
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 Chicago Academic Standards and Framework
 Grade 6

Curriculum Framework Statement

Houghton Mifflin *MATHSTEPS*

CAS C. Add, subtract, multiply, and divide single- and multi-digit whole numbers, fractions, decimals, and percents and understand the relationships between these operations.	
1. Use inverse operations to solve problems.	TE: T25, T70, T155 PE: 30–31, 33–34, 125, 281–282
2. Estimate, then multiply whole numbers and decimals.	TE: T22, T35–37, T67 PE: 12–15, 45–48, 54–55, 111, 113
3. Estimate, then divide whole numbers and decimals.	TE: T16–19, T23, T30–33, T37 PE: 19–21, 51–53
4. Devise problems/situations to add, subtract, multiply, and divide with money amounts.	TE: T22, T24–25, T35–37, T67, T98, T100, T152, T166 PE: 13, 24–25, 34, 44, 46, 48, 50–51, 112, 172, 174, 182, 268, 299
5. Model and solve proportions for a missing value (e.g., determine the value of n if $4/7 = n/21$).	TE: T90–93, T95 PE: 159–164, 171, 177
6. Multiply and divide fractions with like and unlike denominators and mixed numbers.	TE: T60–63, T66, T68–69 PE: 109–110, 117–120
7. Find a given percent of a given number.	TE: T98–99 PE: 171, 175–176
8. Judge the reasonableness of answers in computational problems.	TE: T20, T22 PE: 5, 12–15, 43–48, 100, 111, 113
CAS D. Identify, select and use appropriate strategies (such as using smaller numbers, modeling, guess and check, working backwards, trial and error) to solve problems involving percentages, ratios, and proportions relevant to their experiences.	
1. Explain (orally and in writing) solutions to problems involving whole numbers and fractions and support the solutions with evidence.	TE: T22, T24–25, T65–66, T68, T70 PE: 13, 24–25, 33–34, 105–106, 108, 116, 123–124
2. Solve problems involving tips, tax, discounts, and simple interest.	TE: T90–93, T98 PE: 173–174
3. Use estimation, computers, and calculators to solve problems and check answers.	TE: T20, T22–23, T34–36, T64, T67 PE: 5, 12–15, 19–22, 40, 43–48, 100, 111, 113
CAS E. Identify, apply, and explain properties of numbers (such as prime, composite, factor, divisor, relationships between), of operations (inverse relationship, distributive property), and of mathematical logic.	
1. Identify and explain prime and composite numbers, prime factorization, the greatest common factor (GCF), and the least common multiple (LCM).	TE: T44–50 PE: 69–70, 73–78

Houghton Mifflin *MATHSTEPS*
 Level 6
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 Chicago Academic Standards and Framework
 Grade 6

Curriculum Framework Statement

Houghton Mifflin *MATHSTEPS*

2. Apply the rules of divisibility.	TE: T44–48 PE: 67–68
3. Apply the algebraic order of operations, commutative, associative, and distributive properties, and quantifiers (all, some) to solve problems.	TE: T16–19, T23 PE: 22–23, 72, 283–284
State Goal 7: Estimate, make, and use measurements of objects, quantities, and relationships, and determine acceptable levels of accuracy.	
CAS A. Use standard (metric and customary), tools, scales, and formulas to measure distance, area, capacity, temperature, and weight/mass of objects with whole numbers, fractions, and decimals.	
1. Select and use appropriate measurement units within the customary system and the metric system for length, capacity, temperature, and weight/mass of objects.	TE: T76–79, T80, T82–83 PE: 131–134, 141–144
2. Determine the perimeter of a polygon, the area of a square, rectangle, and triangle, and the volume of a rectangular solid through a variety of means (e.g., measuring, counting squares, stacking cubes), and develop general statements which lead to formulas.	TE: T120–124, T127 PE: 215–218, 229–232
3. Differentiate among perimeter, area, and volume and determine which of these is appropriate to use in a given problem.	TE: T124–125, T127–128 PE: 215–222, 229–230, 232–234
4. Estimate pi, the circumference, and the area of a circle and use the corresponding formulas.	TE: T124–125 PE: 217–219, 221–222
5. Measure and draw angles to the nearest 5° , using a protractor.	TE: T106–110 PE: 189–190
6. Create drawings or models which reflect given measurement specifications (e.g., a square 6 cm on a side, a circle of radius 1" a box 3' x 2' x 4', an angle of 30°).	These pages prepare students to meet this objective: TE: T90–93, T96 PE: 162–164
7. Construct scale drawings from given data.	TE: T90–93, T96 PE: 162–164
CAS B. Estimate measurements, convert units within and between customary and metric systems (e.g., a liter is about a quart), and determine relationships between measurements expressed in different systems (e.g., weight and volume) with reasonable accuracy.	
1. Determine the appropriateness of overestimating or underestimating in computation problems and in different contexts (e.g., How much sand would you need to fill a whole 3' x 2' 4'?).	TE: T20, T22–23, T67, T100 PE: 5, 12, 19, 101, 111, 113, 181
2. Compare and convert, using ratios and proportions, units of measurement within, but not between, the customary and metric units.	TE: T76–80, T82–83, T90–93, T95 PE: 131–134, 141–144, 159–161

Houghton Mifflin *MATHSTEPS*
 Level 6
 correlated to
 Chicago Academic Standards and Framework
 Grade 6

Curriculum Framework Statement

Houghton Mifflin *MATHSTEPS*

3. Convert between and compare units of distance, weight/mass, time, and capacity within the customary system and within the metric system (e.g., 4 quarts = 1 gallon, 1000 grams = 1 kilogram)	TE: T76–80, T82–83 PE: 131–134, 139–144
4. Find the approximate area of simple and curved figures.	TE: T120–125 PE: 215–218, 221–222
5. Estimate angle measurements using 30°, 45°, 60°, 90°, 120°, and 180° as referents.	These pages prepare students to meet this objective: TE: T106–109, T110–111, T113 PE: 188–189, 191–192, 194–195
6. Estimate total area or volume when several objects are combined or grouped (e.g., the height of 3 students standing on one another’s shoulders).	These pages prepare students to meet this objective: TE: T120–124 PE: 215–218
State Goal 8: Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems, and predict results.	
CAS A. Extend, create, describe, and analyze geometric and number patterns.	
1. Show how one quantity determines another quantity in a functional relationship based on a linear pattern (e.g., adding a \$3.50 shipping and handling charge to each purchase: \$5.00 + \$3.50, \$10.00 + \$3.50).	TE: T166–167 PE: 297–298, 300–302
2. Extend simple, non-linear patterns (e.g., 1, 3, 9, 27, 40).	TE: T120–123, T127 PE: 227–228
CAS B. Describe trends, patterns, verbal rules, functions, and other mathematical relationships using tables, graphs, charts, and open sentences created from given or student-generated data.	
1. Describe rules for given number patterns (e.g., 3, 6, 9, 12, ..What is the rule for this pattern?).	TE: T37, T114, T127 PE: 54–55, 206, 227–228
2. Use simple two-dimensional coordinate systems to find locations on a map or diagram.	TE: T162–166 PE: 295–296
3. Create and describe a problem situation based on a given open sentence (e.g., \$29.32 + x = \$30) or graph.	TE: T25, T70, T95, T157, T168 PE: 33–34, 126, 289–290, 308
CAS C. Use variables and equations to solve problems.	
1. Show that an equality or inequality relationship between two quantities (integers and whole numbers) remains the same as long as the same change is made to both quantities.	TE: T25, T39, T70, T156, T166 PE: 30–31, 61–62, 125–126, 159–160, 287–288, 297–299

Houghton Mifflin *MATHSTEPS*
 Level 6
 correlated to
 Chicago Academic Standards and Framework
 Grade 6

Curriculum Framework Statement

Houghton Mifflin *MATHSTEPS*

2. Solve linear equations involving whole numbers.	TE: T162–166 PE: 297–302
CAS D. Model relationships between quantities using tables, charts, mathematical expressions and equations, and graphs to solve problems relevant to student experiences as well as those which arise from mathematical patterns.	
1. Solve open number sentences which describe relationships between quantities.	TE: T25, T39, T70, T156, T166 PE: 30–31, 61–62, 125–126, 159–160, 287–288, 297–299
2. Use numbers, charts, and visual patterns to answer questions about mathematical patterns (e.g., Fibonacci numbers, triangular numbers, Pascal’s triangle).	TE: T37, T114, T127 PE: 54–55, 206, 227–228
3. Solve problems involving fractions, decimals, integers, and numbers with exponents.	TE: T38, T64, T67–70, T152–156 PE: 58, 101, 110, 112, 114, 116, 120, 122, 126, 268, 270, 275–276, 279–282, 284, 286
4. Determine whether there is sufficient information given to solve a problem and/or whether extraneous/irrelevant information is given, and whether the solution to a problems makes sense.	TE: T96 PE: 165–166
5. Determine when it is better to give solutions to problems as exact or approximate.	TE: T34 PE: 40
6. Collect data, analyze information, and graphically represent numerical relationships and patterns using a calculator and/or computer software.	Many lessons can be adapted for use with a calculator or computer software. Here are a few of the many examples. TE: T35–36, T37–38 PE: 45–48, 55–57
State Goal 9: Use geometric methods to analyze, categorize, and draw conclusions about points, lines, planes, and space.	
CAS A. Draw line segments, rays, lines (one dimension) and plane figures (two dimensions), and construct solids (three dimensions).	
1. Create, describe, and extend geometric patterns.	TE: T120–123, T127, T162–165, T169 PE: 227–228, 311–312
2. Identify and construct three-dimensional shapes from two dimensional nets.	TE: T126 PE: 224
3. Create problems/solutions to construct line segments/bisectors and angles/bisectors using appropriate tools.	TE: T106–110 PE: 187–190
4. Draw chords, radii, and diameters of circles.	TE: T111 PE: 193–194

Houghton Mifflin *MATHSTEPS*
Level 6
correlated to
Chicago Academic Standards and Framework
Grade 6

Curriculum Framework Statement

Houghton Mifflin *MATHSTEPS*

5. Create problems/situations to construct line segments/bisectors and angles/bisectors using appropriate tools.	TE: T106–110 PE: 189–196
6. Draw chords, radii, and diameters of circles.	TE: T111 PE: 193–194
7. Identify patterns in a tessellation, using concrete objects and drawings.	This page prepares students to meet this objective: TE: T114 PE: 206
CAS B. Identify, describe, and categorize geometric objects by their properties (parallel, perpendicular, similar, congruent, symmetric about a line).	
1. Determine the congruence of geometric figures by applying slides (translations), flips (reflections), and turns (rotations).	TE: T106–109, T112 PE: 195–196, 205
2. Describe and apply the relationships among the measures of the angles formed when parallel lines are cut by a transversal and apply them to fill in the missing measures of angles.	TE: T111 PE: 191–192, 210
CAS C. Describe the properties of and the relationships among 1–, 2–, and 3– dimensional figures (rectangles, triangles, squares, circles, cubes, prisms, pyramids, cones, cylinders, line segments, rays, and angles).	
1. Identify, draw, and name points, lines, line segments, rays, and angles and describe their relationship.	TE: T110–111 PE: 187–191
2. Identify, describe, and draw parts of geometric figures (vertex, radius, diameter, angle, side, edge, face, chord, midpoint, base, diagonal, arc, semicircle).	TE: T106–112, T120–123, T126 PE: 188–191, 193, 197–198, 201, 223–224
3. Identify and describe one- and two–dimensional part of three dimensional figures (e.g., line segments as edges of a rectangular solid, circle as the base of a circular cylinder).	TE: T120–123, T126 PE: 223–224
5. Draw triangles according to given characteristics.	TE: T112 PE: 197–198
6. Identify, describe, and categorize angles as vertical, adjacent, complementary, and/or supplementary.	TE: T106–111 PE: 189–192
7. Define, describe, and draw quadrilaterals, and triangles from given properties (e.g., a quadrilateral having equal sides but no right angles; a right triangle).	TE: T106–109, T112–113 PE: 197–200
CAS D. Present informational logical arguments (e.g., the area of a right triangle with legs of 3" and 4" is 6 square inches because it is half the area of a 3" x 4" rectangle) using concrete objects, diagrams, and technology.	

Houghton Mifflin *MATHSTEPS*
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Curriculum Framework Statement

Houghton Mifflin *MATHSTEPS*

1. Use drawings and models to demonstrate the difference between the perimeter and the area of figures.	TE: T120–124 PE: 215–216
2. Use drawings and models to verify generalizations of a geometric pattern (e.g., the number of squares to complete the <i>n</i> th squares in the pattern).	TE: T125, T127 PE: 221, 227–228
3. Develop and test conjectures about characteristics of geometric objects.	TE: T111–114, T126 PE: 193, 198–199, 205–206, 223–224
State Goal 10: <i>Collect, organize, and analyze data, using statistical methods to predict results and interpret uncertainty and chance in practical applications.</i>	
CAS A. Interpret data comparing sets of data and using tallies, tables, charts, bar graphs, line graphs, and line plots.	
1. Determine when it is appropriate to use either the mean or the median or range of a group of numbers.	TE: T16–19, T24 PE: 26–29, 241–244
2. Interpret and translate between various visual displays (e.g., broken line graphs and bar graph, tallies, and line plots).	TE: T134–138 PE: 243–244
CAS B. Draw conclusions and evaluate arguments based on data analysis and data displays (tables, charts, graphs), verifying reasoning.	
1. Make statements and draw simple conclusions based on data from visual displays (tables, tallies, plots, charts, circle graphs).	TE: T81, T138–141 PE: 136, 242, 245–246, 249–254
2. Make statements and draw simple conclusions based on estimates of the mean, the actual median, mode and range of set of data (e.g., “The average height of a tower of blocks is 5”, “Most students like red”).	TE: T140–141 PE: 251–254
3. Compare data in order to make true statements (e.g., “Seven plants grew at least 5 cm”) and use these statements to make a simple concluding statement about a situation (e.g., “This kind of plant grows better near sunlight because the seven plants that were near the window grew at least 5 cm and the others grew less.”).	TE: T138 PE: 241–242
4. Interpret data or determine the reasonableness of statements made about the data (e.g., “twice as often”, “three times as fast”).	TE: T81, T138–141 PE: 136, 241–254
5. Read and interpret schedules (e.g., bus schedule, television guide).	TE: T141 PE: 253–254
CAS C. Formulate questions of interests and select ways to systematically collect, organize, and describe data appropriate to the questions.	

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 Level 6
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 Chicago Academic Standards and Framework
 Grade 6

Curriculum Framework Statement

Houghton Mifflin *MATHSTEPS*

1. Gather, organize, and display data using tallies, tables, charts, bar graphs, line graphs, line plots, circle graphs, and stem and leaf plot.	TE: T24, T54, T138, T141 PE: 26, 91–92, 241–242, 253–254
2. Communicate the results of a survey or experiment and use them to predict future results and/or make relevant decisions based on the data gathered.	TE: T134–137, T139 PE: 26, 247–250
3. Explain the concept of “sample,” including the understanding that the larger the sample the more reliable the information will be.	TE: T134–137, T139 PE: 247–252
CAS D. Determine the probability of events when there are equally likely outcomes.	
1. Determine the probability distribution of an event using concrete materials, tree diagram and sample spaces representing all possible results.	TE: T142–143 PE: 257–263
2. Express probabilities as fractions, decimals, and percents.	TE: T141–143 PE: 255–256, 258–263
3. Compare the likelihood of events in terms of <i>certain, more likely, less likely, equally likely, or impossible</i> .	TE: T141 PE: 255–256
4. Find all possible arrangements involving a limited number of variables, (e.g., How many different sandwiches can you make using three types of bread, four types of cheese, and three types of meat?).	TE: T142–143 PE: 257–258, 262
5. Determine the probability of a simple event and express that probability as a ratio, decimal, or percent.	TE: T134–137, T143 PE: 259–262