# Odysseyware®

# **CURRICULUM** OVERVIEW

## Mathematics 800 Fundamentals

# Table of Contents

# Mathematics 800 Fundamentals Course Overview

Mathematics 800 Fundamentals is an introductory algebra course designed to prepare junior-high school students for Algebra I. The course focuses on strengthening needed skills in problem solving, integers, equations, and graphing. Students will begin to see the "big picture" of mathematics and learn how numeric, algebraic, and geometric concepts are woven together to build a foundation for higher mathematical thinking.

- **The Real Number System:** Student will explore different properties of numbers, and how to use them to simplify expressions and formulas to make computations easier.

- **Modeling Problems in Integers:** Student will translate and solve one-step equations, or two-step equations in context, and check solutions for reasonableness, using the order of operations, and by substituting values for variables.

- **Modeling Problems with Rational Numbers:** Student will add, subtract, multiply, and divide decimals, fractions, and mixed numbers with variables, likes, and unlike denominators to solve one and two-step word problems.

- **Proportional Reasoning:** Student will convert between fractions, decimals, and percent's, and compare them, and identify similar and congruent figures and their corresponding parts and solve for missing measures.

- **More with Functions:** Student will identify the parts of a line or quadratic equation and be able to graph it, and explore arithmetic and geometric sequences, as well as exponential growth and decay.

- **Measurement:** Student will explore relationships between sets of lines and the angles they create, understand and use the Pythagorean theorem, and identify characteristics of polygons.

- **Plane Geometry:** Student will determine how to calculate areas of common polygons, identify different transformations and how to determine the type and original image location.

- **Measures of Solid Figures:** Student will calculate surface area and volume of different objects and solve for missing measures of 3 dimensional figures when given surface area or volume and explain the relationship between surface area and volume.

- **Data Analysis:** Student will identify the mean, median, mode, range, lower quartile, and upper quartile of different data sets and construct the best display of the information.

- **Probability:** Student will identify all the possible outcomes of a given situation using combinations, permutations, and probability, and determine if events are dependent or independent.

## Unit 1: The Real Number System

### Assignments

| | | | |
|---|---|---|---|
| 1. | Course Overview | 14. | Alternate Quiz 2 - Form B: Other Forms* |
| 2. | Subsets of the Real Number System | 15. | Square Roots |
| 3. | Using Variables | 16. | Order of Operations |
| 4. | The Number Line | 17. | Quiz 3: Simplifying |
| 5. | Comparing Rational Numbers | 18. | Alternate Quiz 3 - Form A: Simplifying* |
| 6. | Quiz 1: Relationships | 19. | Alternate Quiz 3 - Form B: Simplifying* |
| 7. | Alternate Quiz 1 - Form A: Relationships* | 20. | Special Project* |
| 8. | Alternate Quiz 1 - Form B: Relationships* | 21. | Review |
| 9. | Properties of the Real Numbers | 22. | Test |
| 10. | Exponents | 23. | Alternate Test - Form A* |
| 11. | Scientific Notation | 24. | Alternate Test - Form B* |
| 12. | Quiz 2: Other Forms | 25. | Glossary and Credits |
| 13. | Alternate Quiz 2 - Form A: Other Forms* | | |

## Unit 2: Modeling Problems in Integers

### Assignments

| | | | |
|---|---|---|---|
| 1. | Translating Expressions and Equations | 16. | Evaluating Expressions |
| 2. | Solving One-Step Equations | 17. | Quiz 3: Integers |
| 3. | Solving Two-Step Equations | 18. | Alternate Quiz 3 - Form A: Integers* |
| 4. | Quiz 1: Equations with Real Numbers | 19. | Alternate Quiz 3 - Form B: Integers* |
| 5. | Alternate Quiz 1 - Form A: Equations with Real Numbers* | 20. | Graphing |
| 6. | Alternate Quiz 1 - Form B: Equations with Real Numbers* | 21. | One-Step Equations |
| | | 22. | Two-Step Equations |
| 7. | Relations and Functions | 23. | Problem Solving |
| 8. | Functions | 24. | Quiz 4: Modeling with Integers |
| 9. | Analyzing Graphs | 25. | Alternate Quiz 4 - Form A: Modeling with Integers* |
| 10. | Quiz 2: Functions | 26. | Alternate Quiz 4 - Form B: Modeling with Integers* |
| 11. | Alternate Quiz 2 - Form A: Functions* | 27. | Special Project* |
| 12. | Alternate Quiz 2 - Form B: Functions* | 28. | Review |
| 13. | Addition of Integers | 29. | Test |
| 14. | Subtraction of Integers | 30. | Alternate Test - Form A* |
| 15. | Multiplying and Dividing Integers | 31. | Alternate Test - Form B* |
| | | 32. | Glossary and Credits |

## Unit 3: Modeling Problems With Rational Numbers

### Assignments

1. Prime Factorization and the GCF
2. Simplifying Fractions
3. The LCM and the LCD
4. Quiz 1: Number Theory
5. Alternate Quiz 1 - Form A: Number Theory*
6. Alternate Quiz 1 - Form B: Number Theory*
7. Adding and Subtracting Like Fractions
8. Adding and Subtracting Unlike Fractions
9. Adding and Subtracting Decimal Numbers
10. Multiplying and Dividing Fractions
11. Multiplying and Dividing Decimal Numbers
12. Quiz 2: Solving Problems with Rational Numbers
13. Alternate Quiz 2 - Form A: Solving Problems with Rational Numbers*
14. Alternate Quiz 2 - Form B: Solving Problems with Rational Numbers*
15. One-Step Addition and Subtraction Equations
16. One-Step Multiplication and Division Equations
17. Two-Step Equations
18. One-Step Inequalities
19. Two-Step Inequalities
20. Quiz 3: Solving Equations and Inequalities
21. Alternate Quiz 3 - Form A: Solving Equations and I Inequalities*
22. Alternate Quiz 3 - Form B: Solving Equations and Inequalities*
23. Special Project*
24. Review
25. Test
26. Alternate Test - Form A*
27. Alternate Test - Form B*
28. Glossary and Credits

## Unit 4: Proportional Reasoning

### Assignments

1. Proportions
2. Applications
3. Direct Variation
4. Quiz 1: Proportions
5. Alternate Quiz 1 - Form A: Proportions*
6. Alternate Quiz 1 - Form B: Proportions*
7. Fraction, Percent and Decimal Equivalents
8. Solving Percent Problems
9. Applications
10. More Applications
11. Quiz 2: Percents
12. Alternate Quiz 2 - Form A: Percents*
13. Alternate Quiz 2 - Form B: Percents*
14. Unit Conversion within Customary Units
15. Unit Conversion within Metric Units
16. Corresponding Parts
17. Indirect Measure
18. Models and Scales
19. Quiz 3: Measurement/Similar Figures
20. Alternate Quiz 3 - Form A: Measurement/Similar Figures*
21. Alternate Quiz 3 - Form B: Measurement/Similar Figures*
22. Project: Proportional Reasoning
23. Alternate Project: Proportional Reasoning*
24. Special Project*
25. Review
26. Test
27. Alternate Test - Form A*
28. Alternate Test - Form B*
29. Glossary and Credits

## Unit 5: More With Functions

### Assignments

| | | | |
|---|---|---|---|
| 1. | Rewriting Equations | 16. | Alternate Quiz 2 - Form B: Families of Functions* |
| 2. | Combine Like Terms | 17. | Patterns and Arithmetic Sequences |
| 3. | Solving Equations by Combining Like Terms | 18. | Geometric Sequences |
| 4. | Distributive Property | 19. | Exponential Sequences |
| 5. | Solving Equations with Distributive Property | 20. | Recursive Sequences |
| 6. | Quiz 1: Solving Equations | 21. | Quiz 3: Patterns |
| 7. | Alternate Quiz 1 - Form A: Solving Equations* | 22. | Alternate Quiz 3 - Form A: Patterns* |
| 8. | Alternate Quiz 1 - Form B: Solving Equations* | 23. | Alternate Quiz 3 - Form B: Patterns* |
| 9. | Slope | 24. | Special Project* |
| 10. | Using Intercepts | 25. | Review |
| 11. | Slope-Intercept Form | 26. | Test |
| 12. | More Slope-Intercept Form | 27. | Alternate Test - Form A* |
| 13. | Non-Linear Functions | 28. | Alternate Test - Form B* |
| 14. | Quiz 2: Families of Functions | 29. | Glossary and Credits |
| 15. | Alternate Quiz 2 - Form A: Families of Functions* | | |

## Unit 6: Measurement

### Assignments

| | | | |
|---|---|---|---|
| 1. | Classify and Measure Angles | 12. | Quiz 2: Polygons |
| 2. | Perpendicular and Parallel Lines, Part 1 | 13. | Alternate Quiz 2 - Form A: Polygons* |
| 3. | Perpendicular and Parallel Lines, Part 2 | 14. | Alternate Quiz 2 - Form B: Polygons* |
| 4. | Circles | 15. | Pythagorean Theorem, Part 1 |
| 5. | Quiz 1: Angle Measures and Circles | 16. | Pythagorean Theorem, Part 2 |
| 6. | Alternate Quiz 1 - Form A: Angle Measures and Circles* | 17. | Quiz 3: Indirect Measure |
| 7. | Alternate Quiz 1 - Form B: Angle Measures and Circles* | 18. | Alternate Quiz 3 - Form A: Indirect Measure* |
| | | 19. | Alternate Quiz 3 - Form B: Indirect Measure* |
| 8. | Classifying Polygons | 20. | Special Project* |
| 9. | Interior and Exterior Measures of Polygons | 21. | Review |
| 10. | Classifying Triangles and the Triangle Inequality Theorem | 22. | Test |
| | | 23. | Alternate Test - Form A* |
| 11. | The Quadrilateral Family | 24. | Alternate Test - Form B* |
| | | 25. | Glossary and Credits |

## Unit 7: Plane Geometry

### Assignments

| | | | |
|---|---|---|---|
| 1. | Perimeter and Circumference | 15. | Alternate Quiz 2 - Form B: Symmetry and Reflections* |
| 2. | Area of Parallelograms | | |
| 3. | Area of Triangles and Trapezoids | 16. | Translations |
| 4. | Area of Circles | 17. | Tessellations |
| 5. | Composite Figures | 18. | Rotations |
| 6. | Effects of Dimensional Changes | 19. | Dilations |
| 7. | Quiz 1: Perimeter and Area | 20. | Quiz 3: Other Transformations |
| 8. | Alternate Quiz 1 - Form A: Perimeter and Area* | 21. | Alternate Quiz 3 - Form A: Other Transformations* |
| 9. | Alternate Quiz 1 - Form B: Perimeter and Area* | 22. | Alternate Quiz 3 - Form B: Other Transformations* |
| 10. | Symmetry | 23. | Special Project* |
| 11. | Distance and Midpoint | 24. | Review |
| 12. | Reflections | 25. | Test |
| 13. | Quiz 2: Symmetry and Reflections | 26. | Alternate Test - Form A* |
| 14. | Alternate Quiz 2 - Form A: Symmetry and Reflections* | 27. | Alternate Test - Form B* |
| | | 28. | Glossary and Credits |

## Unit 8: Measures of Solid Figures

**Assignments**

| | | | |
|---|---|---|---|
| 1. | Solid Figures | 15. | Volume of Cones |
| 2. | Euler's Formula | 16. | Volume of Spheres |
| 3. | Surface Area of Rectangular Prisms | 17. | Changes to Volume |
| 4. | Surface Area of Triangular Prisms | 18. | Volume of Composite Figures |
| 5. | Surface Area of Cylinders | 19. | Quiz 2: Volume |
| 6. | Surface Area of Pyramids, Cones, and Spheres | 20. | Alternate Quiz 2 - Form A: Volume* |
| 7. | Surface Area of Composite Figures | 21. | Alternate Quiz 2 - Form B: Volume* |
| 8. | Quiz 1: Surface Area | 22. | Special Project* |
| 9. | Alternate Quiz 1 - Form A: Surface Area* | 23. | Review |
| 10. | Alternate Quiz 1 - Form B: Surface Area* | 24. | Test |
| 11. | Volume of Rectangular Prisms | 25. | Alternate Test - Form A* |
| 12. | Volume of Triangular Prisms | 26. | Alternate Test - Form B* |
| 13. | Volume of Square Pyramids | 27. | Glossary and Credits |
| 14. | Volume of Cylinders | 28. | |

## Unit 9: Data Analysis

**Assignments**

| | | | |
|---|---|---|---|
| 1. | Collecting Data | 12. | Scatter Plots |
| 2. | Measures of Central Tendency and Dispersion | 13. | Misleading Graphs |
| 3. | Bar Graphs | 14. | Appropriate Displays |
| 4. | Circle Graphs | 15. | Quiz 2: More Data Displays |
| 5. | Line Graphs | 16. | Alternate Quiz 2 - Form A: More Data Displays* |
| 6. | Frequency and Histograms | 17. | Alternate Quiz 2 - Form B: More Data Displays* |
| 7. | Quiz 1: Collecting and Representing Data | 18. | Special Project* |
| 8. | Alternate Quiz 1 - Form A: Collecting and Representing Data* | 19. | Review |
| 9. | Alternate Quiz 1 - Form B: Collecting and Representing Data* | 20. | Test |
| | | 21. | Alternate Test - Form A* |
| 10. | Constructing Box-and-Whisker Plots | 22. | Alternate Test - Form B* |
| 11. | Interpreting Box-and-Whisker Plots | 23. | Glossary and Credits |

## Unit 10: Probability

**Assignments**

| | | | |
|---|---|---|---|
| 1. | Tree Diagrams and the Counting Principle | 12. | Quiz 2: Probability |
| 2. | Permutations | 13. | Alternate Quiz 2 - Form A: Probability* |
| 3. | Combinations | 14. | Alternate Quiz 2 - Form B: Probability* |
| 4. | Mixed Review of Outcomes | 15. | Simulate a Problem |
| 5. | Quiz 1: Outcomes | 16. | Quest: All That's Fair In...* |
| 6. | Alternate Quiz 1 - Form A: Outcomes* | 17. | Special Project* |
| 7. | Alternate Quiz 1 - Form B: Outcomes* | 18. | Review |
| 8. | Probability and Odds | 19. | Test |
| 9. | Experimental vs Theoretical Probability | 20. | Alternate Test - Form A* |
| 10. | Disjointed and Overlapping Events | 21. | Alternate Test - Form B* |
| 11. | Independent and Dependent Events | 22. | Glossary and Credits |

| Unit 11: Course Review and Exam | |
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| **Assignments** | |
| 1. Review I | 4. Alternate Exam - Form A* |
| 2. Review II | 5. Alternate Exam - Form B* |
| 3. Exam | |

(*) Indicates alternative assignment