# Grade 7 Mathematics Teacher Packet
# AoPS Introduction to Algebra and Brilliant

## Nantucket New School

## Course Overview

Grade 7 marks the move from arithmetic dominated thinking to formal algebra. Students work with expressions, equations, multivariable relationships, proportions, percents, graphing lines, and introductory inequalities. AoPS Introduction to Algebra supplies the structure. Brilliant supports visualization and modeling.

### Core AoPS Chapters

Primary text: *AoPS Introduction to Algebra*

- Chapters 1 through 9

## Unit and Resource Map

| Unit | AoPS focus | Brilliant focus (main courses) |
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| Algebra foundations and expressions | Chapter 1 Sections 1.1–1.6 and Chapter 2 Sections 2.1–2.3. Properties, order of operations, distribution, factoring, and arithmetic with expressions. | *Visual Algebra* as the primary course, with selected *Real World Algebra* lessons that highlight expressions and structure. |
| Linear equations and word problems | Review of Chapter 1 Section 1.5 and Chapter 3 Sections 3.1–3.3 with stretch into 3.4 where appropriate. Solving linear equations, including fractional and multi step forms, and equation word problems. | *Solving Equations*, *Visual Algebra* balance puzzles, and *Real World Algebra* one variable modeling tasks. |
| Multivariable expressions and systems | Chapter 4 Sections 4.1–4.5 and Chapter 5 Sections 5.1–5.3. Multivariable expressions, distribution, factoring, and simple systems by substitution. | *Functions* early input output lessons, *Visual Algebra* multivariable strands, and *Real World Algebra* mixture and rate systems. |

| Unit | AoPS focus | Brilliant focus (main courses) |
|---|---|---|
| Ratios, percents, and proportion in algebra | Chapter 6 Sections 6.1–6.5 and Chapter 7 Sections 7.1–7.4. Ratios, unit rates, percent problems, direct and inverse proportion, and joint proportion. | *Proportional Reasoning*, *Arithmetic Thinking* rate sequences, and *Real World Algebra* percent and scaling models. |
| Graphing lines and introductory inequalities | Chapter 8 Sections 8.1–8.6 and Chapter 9 Sections 9.1–9.3. Coordinate plane, graphing linear equations, slope, slope intercept form, line comparisons, and simple inequalities. | *Coordinate Geometry*, *Coordinate Plane*, and *Functions* lessons focused on linear graphs and basic inequalities. |

## Planning Notes

- Let Brilliant carry most of the visual work for slope, intercepts, and graph comparison.

- Treat Brilliant equation and balance tasks as bridges into harder AoPS exercises.