

Correlation of Geometry to the NCTM Standards

STANDARD 1 Number and Operations

Instructional programs should enable all students to:

- ◆ understand numbers, ways of representing numbers, relationships among numbers, and number systems;
- ◆ understand meanings of operations and how they relate to one another;
- ◆ compute fluently and make reasonable estimates.

AGS Geometry

Understand numbers, number representations, number systems, and relationships: pages 8, 24–29, 96–97, 236–64, 282–85, 270–73, 277–81, 302–3.

Understand meanings of operations: pages 24, 28–29, 58–59, 117, 262–63, 277, 296.

Compute fluently and make reasonable estimates: Exercises at the close of each lesson are designed to build students' fluency in computation. In addition, see *Calculator Practice* activities, pages 22, 54, 119, 130, 134, 183, 213, 240, 250, 273, 280, 298, 333, 358, 369; and *Estimation Activities*, pages 26, 54, 76, 119, 176, 201, 244, 279, 328, 375, 391.

STANDARD 2 Algebra

Instructional programs should enable all students to:

- ◆ understand patterns, relations, and functions;
- ◆ represent and analyze mathematical situations and structures using algebraic symbols;
- ◆ use mathematical models to represent and understand quantitative relationships;
- ◆ analyze change in various contexts.

AGS Geometry

Understand patterns, relations, and functions: pages 115–26, 166–71, 221–23, 236–59, 270–303, 310–16, 321–29, 330–35, 338, 347–50.

Represent or analyze mathematical situations using symbols: Universal symbols for geometric figures (points, ray, angle, line, line segment, parallel, perpendicular, triangle...) as well as algebraic symbols (equal, unequal, greater than, less than, factorial...) are used throughout the text.

Mathematical models are inherent in the following:

Geometry in Your Life, pages 23, 27, 45, 50, 95, 111, 159, 179, 217, 227, 252, 289, 293, 322, 349, 372, 388, 412; and

Application exercises at the end of each chapter, pages 30, 60, 98, 138, 186, 230, 264, 304, 338, 378, 404, 422.

Analyze change: pages 115–20, 136–38, 214–18, 221–27, 230.

STANDARD 3 Geometry

Instructional programs should enable all students to:

- ◆ analyze characteristics and properties of two- and three-dimensional geometric shapes and develop mathematical arguments about geometric relationships;
- ◆ specify locations and describe spatial relationships using coordinate geometry and other representational systems;
- ◆ apply transformations and use symmetry to analyze mathematical situations;
- ◆ use visualization, spatial reasoning, and geometric modeling to solve problems.

AGS Geometry

Analyze characteristics and properties of two- and three-dimensional geometric shapes: pages 11–14, 28, 66–68, 81–84, 143–86, 192–227, 230, 236–61, 264, 270–76, 304, 310–12, 317–35, 338, 344–75, 384–99, 404, 410–12, 417–19, 422.

Use coordinate geometry to specify location and spatial relationships: pages 103–38, 214–18, 221–27, 251–61, 294–98, 317–20, 336–37, 376–77, 413–16.

Apply transformations and use symmetry: pages 214–27, 230, 251–61.

Use visualization, spatial reasoning, or geometric modeling: pages 15–19, 214–27, 230, 321–35, 338, 356, 368–69, 372–75, 384–99, 404, 410–12, 417–19, 422.

Refer also to

Problem Solving exercises on pages 6, 14, 19, 27, 45, 57, 76–80, 95, 97, 108, 111, 114, 126, 137, 171, 197, 207, 213, 246, 257, 261, 285, 316, 325, 350, 387, 399, 412; *Application* exercises on pages 30, 60, 98, 138, 186, 230, 264, 304, 338, 378, 404, 422; and

Geometry in Your Life: pages 23, 27, 45, 50, 95, 111, 159, 179, 217, 227, 252, 289, 293, 322, 349, 372, 388, 412.

STANDARD 4 Measurement

Instructional programs should enable all students to:

- ◆ understand measurable attributes of objects and the units, systems, and processes of measurement;
- ◆ apply appropriate techniques, tools, and formulas to determine measurements.

AGS Geometry

Understand measurable attributes, measurement units and systems: pages 15–19, 247–52, 400–1.

Apply appropriate measurement techniques, tools, or formulas: pages 7–10, 15–19, 51–54, 116, 133, 221–22, 247–52, 270–89, 294–98, 310–335, 338, 347–53, 356–59, 313–16, 384–99, 400–1.

STANDARD 5 Data Analysis and Probability

Instructional programs should enable all students to:

- ◆ formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them;
- ◆ select and use appropriate statistical methods to analyze data;
- ◆ develop and evaluate inferences and predictions that are based on data;
- ◆ understand and apply basic concepts of probability.

AGS Geometry

Collect, organize, display or analyze data:

Application exercises on pages 30, 60, 98, 138, 186, 230, 264, 304, 338, 378, 404, 422;

Problem Solving exercises on pages 6, 14, 19, 27, 45, 57, 76–80, 95, 97, 108, 111, 114, 126, 137, 171, 197, 207, 213, 246, 257, 261, 285, 316, 325, 350, 387, 399, 412;

Try This exercises on pages 6, 40, 68, 185, 220, 241, 263, 289, 329, 335, 355, 363, 399.

Use statistical methods: pages 290, 378.

Develop and evaluate inferences and predictions: pages 219–20, 368–71.

Understand and apply basic probability: pages 354–55.

STANDARD 6 Problem Solving

Instructional programs should enable all students to:

- ◆ build new mathematical knowledge through problem solving;
- ◆ solve problems that arise in mathematics and in other contexts;
- ◆ apply and adapt a variety of appropriate strategies to solve problems;
- ◆ monitor and reflect on the process of mathematical problem solving.

AGS Geometry

Build new knowledge, solve mathematical problems, apply and adapt a variety of strategies:

Problem Solving exercises provide students with opportunities to apply problem-solving strategies and reflect on problem-solving processes. See examples on pages 6, 14, 19, 27, 45, 57, 76–80, 95, 97, 108, 111, 114, 126, 137, 171, 197, 207, 213, 246, 257, 261, 285, 316, 325, 350, 387, 399, 412. See also *Application* exercises, pages 30, 60, 98, 138, 186, 230, 264, 304, 338, 378, 404, 422; and

Geometry in Your Life on pages 23, 27, 45, 50, 95, 111, 159, 179, 217, 227, 252, 289, 293, 322, 349, 372, 388, 412.

STANDARD 7 Reasoning and Proof

Instructional programs should enable all students to:

- ◆ recognize reasoning and proof as fundamental aspects of mathematics;
- ◆ make and investigate mathematical conjectures;
- ◆ develop and evaluate mathematical arguments and proofs;
- ◆ select and use various types of reasoning and methods of proof.

AGS Geometry

Recognize reasoning and proof as fundamental to mathematics:

pages 36–57, 69–77, 161–65, 274–85, 299–301.

Investigate conjectures, develop arguments and proofs: pages 81–84, 179–83, 192–213, 274–85, 290–93, 299–301.

Employ a variety of reasonings and proofs: pages 36–57, 85–88, 90, 92–94, 158–65, 192–213, 238, 244, 277–81, 286–93, 299–301, 367.

STANDARD 8 Communication

Instructional programs should enable all students to:

- ◆ organize and consolidate their mathematical thinking through communication;
- ◆ communicate their mathematical thinking coherently and clearly to peers, teachers, and others;
- ◆ analyze and evaluate the mathematical thinking and strategies of others;
- ◆ use the language of mathematics to express mathematical ideas precisely.

AGS Geometry

Organize and communicate mathematical thoughts:

Writing About Mathematics exercises provide specific opportunities for written communication; pages 17, 21, 23–24, 37, 50, 67, 71, 93, 125, 130, 134, 145, 157, 168, 201, 216, 223, 227, 244, 250, 298, 301, 316, 324, 350, 353, 363, 375, 399, 410; see also

Problem Solving exercises, pages 6, 14, 19, 27, 45, 57, 76–80, 95, 97, 108, 111, 114, 126, 137, 171, 197, 207, 213, 246, 257, 261, 285, 316, 325, 350, 387, 399, 412. *Learning Styles (Auditory/Verbal and Interpersonal/Group Learning)* sidebars in the Teacher's Edition promote communication with peers, teachers, and others.

STANDARD 8 Communication, continued

AGS Geometry

Analyze and evaluate contributions of others: pages 41–45, 270–76, 201, 272, 277, 282–85, 290–93, 330–35, 338.

Use language of mathematics to express ideas:

Graphical representations, pages 41, 104–37, 112–14, 214–27, 336–37, 378,
Formulas, pages 116, 133, 168, 221–22, 294–98, 313–16, 331–35, 351–53,
356–59, 384–99, 420–21.

See also *Algebra Review* prompts on pages 8, 24, 41, 201, 272, 314, 296, 318,
351, 354, 394, 401, 410, 413.

Definitions of topic-relevant terms are included at point-of-use throughout text.

STANDARD 9 Connections

Instructional programs should enable all students to:

- ◆ recognize and use connections among mathematical ideas;
- ◆ understand how mathematical ideas interconnect and build on one another to produce a coherent whole;
- ◆ recognize and apply mathematics in contexts outside of mathematics

AGS Geometry

Relationships and interconnections among geometric principles—lines, planes, formal proofs, Euclid’s Postulates, figure construction, and characteristics of specific groups of figures—are explored throughout the text and presented integrated whole.

Connections between geometry and algebra: pages 24–29, 51–54, 77–80, 58–59, 96–97, 102–3, 104–38, 184–85, 208–13, 228–29, 247–52, 262–63, 270–73, 277–89, 294–301, 302–3, 310–37, 344–50, 376–77, 402–3, 413–16, 420–21.

Connections between geometry and other disciplines are explored in

Chapter openers on pages x–1, 34–35, 64–65, 102–3, 142–43, 190–91,
234–35, 268–69, 308–9, 342–43, 382–83, 408–9;

Application exercises on pages 30, 60, 98, 138, 186, 230, 264, 304, 338, 378,
404, 422;

Technology Connections on pages 10, 37, 68, 110, 163, 218, 261, 275, 334,
375, 403, 416; and

Geometry in Your Life features on pages 23, 27, 45, 50, 95, 111, 159, 179, 217,
227, 252, 289, 293, 322, 349, 372, 388, 412.

STANDARD 10 Representation

Instructional programs should enable all students to:

- ◆ create and use representation to organize, record, and communicate mathematical ideas;
- ◆ select, apply, and translate among mathematical representations to solve problems;
- ◆ use representations to model and interpret physical, social, and mathematical phenomena.

AGS Geometry

Create or use representations to record and communicate mathematical ideas:

Construction examples and exercises are used throughout the program to maximize student understanding of geometric basic representations. In particular, see pages 2–19, 46–50, 69–71, 77–80, 83–94, 127–35, 144–54, 172–78, 192–207, 249–50, 367.

Create, use, select, apply, or translate mathematical representations:

Chart or tables, pages 6, 38, 51, 157, 170–71, 220, 293, 349, 378, 387, 390 401;

Equations, pages 96–97, 127–30, 228–29, 336–37, 376–77, 402–3, 420–21;

Formulas, pages 116, 133, 168, 221–22, 294–98, 313–16, 321–35, 351–53,
356–59, 384–99; and

Drawings, 30, 50, 214, 230.

Models used to represent physical, social, and mathematical phenomena occur throughout the program. In particular see

Geometry in Your Life features on pages 23, 27, 45, 50, 95, 111, 159, 179, 217,
227, 252, 289, 293, 322, 349, 372, 388, 412; and

Application exercises on pages 30, 60, 98, 138, 186, 230, 264, 304, 338, 378,
404, 422.

In addition, concrete models are supported by Manipulative activities in the Teacher’s Edition.