

TABLE OF CONTENTS

HOW THIS MANUAL CAN BE USED	1
INTRODUCTION	4
GEOMETRY	6
Introduction	6
Lines and Angles	18
Background Information	18
Activity 1: Investigating Relationships Between Two Lines: Intersecting, Perpendicular, and Oblique Lines	23
Activity 2: Naming Five Types of Angles	26
Activity 3: Measuring Angles with a Protractor	28
Activity 4: Drawing Angles with a Protractor	31
Activity 5: Adding and Subtracting Angles	33
Activity 6: Naming Relationships Between Two Angles	35
Activity 7: Naming the Angles Formed by Two Straight Lines Cut by a Transversal	39
Triangles	43
Background Information	43
Activity 1: Identifying the Parts of a Triangle	46
Activity 2: Classifying Triangles by Their Sides	48
Activity 3: Classifying Triangles by Their Angles	50
Activity 4: Adding Up the Interior Angles of a Triangle	52
Quadrilaterals	55
Background Information	55
Activity 1: Identifying the Quadrilaterals	57
Many-Sided Polygons	60
Background Information	60
Activity 1: Identifying Many-Sided Polygons	62
Activity 2: Adding Up the Interior Angles of Polygons	65
The Circle	68
Background Information	68
Activity 1: Drawing the Parts of a Circle	71
Activity 2: Measuring Parts of a Circle	75

Activity 3: Relating Parts of a Circle: Lines and Circumference, Lines and Radius	.78
Activity 4: Relating Parts of a Circle: Two Circumferences	.81
Geometric Solid Shapes	.85
Background Information	.85
Activity 1: Identifying Geometric Solid Shapes	.90
Activity 2: Identifying the Parts of a Geometric Solid Shape	.93
Activity 3: Investigating Heights and Cross-Sections	.95
Line Symmetry	.98
Background Information	.98
Activity 1: Creating and Identifying Lines of Symmetry	.99
Constructing Geometric Figures: Lines and Angles	.102
Background Information	.102
Activity 1: Constructing a Congruent Line Segment	.103
Activity 2: Bisecting a Line Segment	.105
Activity 3: Constructing Perpendicular Lines	.107
Activity 4: Constructing Parallel Lines	.110
Activity 5: Bisecting an Angle	.112
Constructing Geometric Figures: Circles, Ellipses, and Squares	.114
Background Information	.114
Activity 1: Exploring Circles as Geometric Figures	.115
Activity 2: Constructing an Ellipse	.117
Activity 3: Constructing a Square	.120
Constructing the Regular Polyhedra	.123
Background Information	.123
Activity 1: Finding Out About the Five Regular Polyhedra	.125
Activity 2: Constructing a Cube	.127
Activity 3: Constructing a Regular Tetrahedron	.129
Activity 4: Constructing a Regular Octahedron, Regular Dodecahedron, and Regular Icosahedron	.131
Introduction to Similar, Congruent, and Equivalent Figures	.133
Background Information	.133
Activity 1: Recognizing Similar and Non-Similar Figures	.135
Activity 2: Recognizing and Making Congruent Figures	.138
Activity 3: Recognizing and Making Equivalent Figures	.140
Calculating Areas of Polygons and Circles	.143
Background Information	.143
Activity 1: Studying Equivalent Figures	.151

Activity 2: Calculating the Area of a Rectangle	.163
Activity 3: Calculating the Area of a Square	.167
Activity 4: Calculating the Area of a Parallelogram	.169
Activity 5: Calculating the Area of an Acute Triangle	.173
Activity 6: Calculating the Area of a Right Triangle	.181
Activity 7: Calculating the Area of an Obtuse Triangle	.188
Activity 8: Calculating the Area of a Trapezoid	.196
Activity 9: Calculating the Area of a Regular Pentagon	.200
Activity 10: Calculating the Area of a Regular Decagon	.205
Activity 11: Calculating the Area of Any Regular Polygon	.211
Activity 12: Calculating the Area of an Irregular Polygon	.214
Activity 13: Considering the Circle as a Regular Polygon with an Infinite Number of Sides	.218
Activity 14: Calculating the Area of a Circle by Considering the Circle as a Rectangular Arrangement of Sectors	.222
Calculating Volumes of Geometric Solids	.226
Background Information	.226
Activity 1: Using Cubes to Measure Volume	.230
Activity 2: Calculating the Volume of Any Rectangular Prism or Cube	.235
Activity 3: Working with Equivalent Volumes	.238
Activity 4: Calculating the Volume of a Pyramid	.240
Activity 5: Calculating the Volume of a Cylinder	.244
Activity 6: Calculating the Volume of a Cone	.247
Activity 7: Calculating the Volume of a Sphere	.250
Activity 8: Understanding Equivalency and Calculating Volume of Solid Prisms with Varying Bases	.254
Calculating Lateral and Total Area of Solids	.258
Background Information	.258
Activity 1: Lateral and Total Area of a Rectangular-Based Prism	.259
Activity 2: Lateral and Total Area of a Triangular-Based Prism	.262
Activity 3: Lateral and Total Area of a Cylinder	.265
Activity 4: Lateral and Total Area of a Square-Based Pyramid	.268
Activity 5: Lateral and Total Area of a Cone	.271
Pythagorean Theorem	.274
Background Information	.274
Activity 1: Recognizing the Isosceles Right Triangle Case of the Pythagorean Theorem	.277
Activity 2: Recognizing the 3:4:5 Right Triangle Case of the Pythagorean Theorem	.280

Activity 3: Exploring the Pythagorean Theorem
Using Equivalent Parallelograms283

Activity 4: Illustrating Euclid’s Theorem Using
Equivalent Parallelograms286

RESOURCES291