



TABLE OF CONTENTS

HOW THIS MANUAL CAN BE USED	1
INTRODUCTION	4
EARTH'S ATMOSPHERE	7
Introduction	7
Climate and the Atmosphere	9
Background Information	9
Activity 1: Investigating the Layers of the Atmosphere	16
Activity 2: Investigating the Climatic Zones	18
Activity 3: Focusing on Biomes	20
Global Weather Patterns	22
Background Information	22
Activity 1: Predicting the Weather	28
Activity 2: Investigating Global Air Movement	30
Activity 3: Simulating the Coriolis Effect	32
Weather Systems and Weather Maps	34
Background Information	34
Activity 1: Investigating Hurricanes and Thunderstorms	37
Activity 2: Investigating Cold Fronts and Warm Fronts	39
The Water Cycle, Clouds, and Rainbows	41
Background Information	41
Activity 1: Observing the Water Cycle on a Small Scale	46
Activity 2: Classifying Clouds	48
Activity 3: Creating Rainbows	50
EARTH'S HYDROSPHERE	52
Introduction	52
Oceans and Seas	53
Background Information	53
Activity 1: Investigating the Earth's Oceans	61
Activity 2: Investigating the Earth's Seas	63
Activity 3: Tracking Surface Ocean Currents	65
Activity 4: Simulating Deep-Water Currents	67

Rivers of Water and Ice	70
Background Information	70
Activity 1: Investigating Rivers of Water	76
Activity 2: Looking at the World's Major Rivers	78
Activity 3: Examining Watershed Drainage Patterns	80
Activity 4: Investigating Rivers of Ice	82
Lakes, Wetlands, and Aquifers	84
Background Information	84
Activity 1: Investigating Lakes	88
Activity 2: Looking at the World's Major Lakes	90
Activity 3: Investigating Wetlands and Aquifers	92
 EARTH'S LITHOSPHERE	 94
Introduction	94
The Earth's Layers	95
Background Information	95
Activity 1: Focusing on the Layers of the Earth	101
Activity 2: Investigating Plate Tectonics	103
Activity 3: Making a Jigsaw Puzzle Showing the Tectonic Plates	105
Volcanoes	107
Background Information	107
Activity 1: Investigating How Volcanoes Form	113
Activity 2: Studying the Four Types of Volcanoes	115
Activity 3: Exploring the Impact of Volcanoes on Humans	117
Earthquakes	118
Background Information	118
Activity 1: Demonstrating Types of Faults	124
Activity 2: Demonstrating Elastic Rebound	126
Activity 3: Investigating How Seismic Waves Travel	129
Activity 4: Investigating How Earthquakes Can Be Measured	131
Continents, Islands, and Coastlines	132
Background Information	132
Activity 1: Focusing on Continents and Continental Drift	138
Activity 2: Investigating the Continental Shelf and Islands	140
Activity 3: Examining Coastlines	142



Mountains, Valleys, and Plains	144
Background Information	144
Activity 1: Investigating Mountains	150
Activity 2: Investigating the Main Types of Valleys	152
Activity 3: Investigating Plains	154
Rocks and Minerals	156
Background Information	156
Activity 1: Focusing on Minerals	165
Activity 2: Simulating Types of Mineral Segregation	167
Activity 3: Investigating the Rock Cycle	170
Activity 4: Classifying Rocks and Minerals	173
Weathering and Erosion	176
Background Information	176
Activity 1: Exploring Types of Weathering	180
Activity 2: Exploring Erosion	182
RESOURCES	183