



TABLE OF CONTENTS

HOW THIS MANUAL CAN BE USED	1
INTRODUCTION	3
MATTER	6
Introduction	6
Atoms	7
Background Information	7
Activity 1: Learning About the Parts of the Atom	12
Activity 2: Investigating the Size of Atoms	15
Activity 3: Exploring the Structure of the Atom	17
Molecules	20
Background Information	20
Activity 1: Learning About Molecules	23
Activity 2: Making Models of Water Molecules	26
Experiment 1: Investigating the Attraction of Water Molecules	29
Chemical Elements	33
Background Information	33
Activity 1: Learning About the Periodic Table of the Elements: Part 1	38
Activity 2: Learning About the Periodic Table of the Elements: Part 2	41
Activity 3: Learning About the Elements in Common Materials	42
The States of Matter	44
Background Information	44
Experiment 1: Changing a Solid to a Liquid to a Gas	48
Activity 1: Demonstrating Changes in States of Matter	50
Activity 2: Demonstrating How Solids, Liquids and Gases Exert Pressure	53
Experiment 2: Investigating the Expansion of a Gas Through Change in Temperature	55
Changes in Matter	57
Background Information	57
Experiment 1: Investigating Physical Changes in Matter	59
Activity 1: Demonstrating Chemical Changes in Matter	62
Experiment 2: Investigating Chemical Changes in Reactions	64
Experiment 3: Investigating a Reaction With a Compound	66

Combinations of Matter	69
Background Information	69
Activity 1: Demonstrating Elements, Compounds, and Mixtures	70
Experiment 1: Investigating the Nature of a Mixture	72
ASTRONOMY	75
Introduction	75
Explanations for Creation	76
Background Information	76
Activity 1: Exploring Creation Myths	81
Activity 2: Demonstrating How Creation Myths Develop	83
Activity 3: Discovering the Shape of the Earth	85
Activity 4: Understanding the Modern Scientific Theory of Creation	87
The Life Cycle of Stars	89
Background Information	89
Activity 1: Making a Model Showing the Formation of a Protostar	95
Activity 2: Exploring How a Protostar Becomes a Star	97
Activity 3: Exploring the Life Cycle of an Average Star	99
Activity 4: Exploring the Brightness of Stars	102
Activity 5: Exploring the Life Cycle of a Giant Star	104
The Solar System	106
Background Information	106
Activity 1: Exploring the Sizes of the Sun and the Planets	113
Activity 2: Exploring the Orbits of the Planets	115
Activity 3: Exploring the Planets	117
Activity 4: Exploring the Planetary Day of Each Planet	119
Activity 5: Exploring the Planetary Year of Each Planet	121
Earth and the Sun	123
Background Information	123
Activity 1: Demonstrating the Cycle of Day and Night	128
Activity 2: Examining the Tilt and Orbit of the Earth	130
Activity 3: Showing How the Seasons Arise	132
Activity 4: Investigating a Second Cause of the Seasons	134
Activity 5: Investigating the Causes of Solar and Lunar Eclipses	136
RESOURCES	138
GLOSSARY	144