

TABLE OF CONTENTS

Acknowledgments

Licensing

Introduction

About this Book

1: Starting our Journey of Discovery

- 1.1: Building a Solar Clock and Calendar

2: Lunar Phases – A Simple Scientific Model

- 2.1: Making a Moon Phase Map

3: Modeling Earth and Moon Together

- 3.1: Making a Scale Model of the Earth-Moon System
- 3.2: Exploring the Moon's Orbit
- 3.3: Rotation and Revolution

4: Measuring Time in the Sky

- 4.1: The Earth Clock
- 4.2: Moonrise and Moonset

5: Measuring and Mapping the Sky

- 5.1: Altitude and Azimuth – Your Place in the Sky
- 5.2: Measuring the Nightly Path of the Moon
- 5.3: Measuring the Moon's Orbital Motion
- 5.4: Measuring the Earth with Eratosthenes
- 5.5: Mapping the Constellations

6: Exploring Gravity

- 6.1: Galileo Explores Gravity with Pendulums
- 6.2: Hooke's Pendulum
- 6.3: Galileo's Falling Bodies
- 6.4: Packard's Acceleration Ramp

7: Proving the Heliocentric Model Correct

- 7.1: Modeling the Moons of Jupiter
- 7.2: The Phases of Venus

8: Understanding Big Numbers

- 8.1: Million, Billion, Trillion- Big Numbers and Money
- 8.2: The Thousand-Meter Solar System

9: Orbital Dynamics- Planets and Moons in Motion

- 9.1: A Working Model of the Lunar Phases
- 9.2: Aristotle's Flat Moon

10: War of the Worlds- How Impacts Build Planets

- 10.1: Modeling the Moon's Surface in Clay
- 10.2: Dynamically Modelling The Moon's Surface in Flour
- 10.3: Exploring Crater Rays in Detail
- 10.4: Dynamically Modeling The Lunar Surface in Plaster

11: The Four Seasons - Two Competing Models

- 11.1: The Elliptical Model of the Seasons
- 11.2: The Tilted Axis Model of the Seasons

12: Safely Observing the Sun

- 12.1: The Pinhole Camera
- 12.2: The Binocular Projector
- 12.3: The Tree Projector

13: Solar and Lunar Eclipses

- 13.1: Modeling a Solar Eclipse
- 13.2: Modeling a Lunar Eclipse
- 13.3: Why are Eclipses so Rare?

[Index](#)

[Famous Names in Astronomy](#)

[Glossary](#)

[Detailed Licensing](#)