

# TEACHER GUIDE

9th–12th Grade

Includes Student  
Worksheets

Science



Weekly Lesson Schedule



Quizzes



Answer Key

## SURVEY OF ASTRONOMY







**MASTERBOOKS**<sup>®</sup>  
— CURRICULUM —

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-  Quizzes

# Survey of Astronomy



**MASTERBOOKS®**  
— CURRICULUM —

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### Author Bios:

**Dr. Donald DeYoung** was Chairman of the Science and Mathematics Department, Grace College, Winona Lake, Indiana for 46 years. He is a graduate of Michigan Tech University (B.S., M.S., Physics), Iowa State University (Ph.D., Physics), and Grace Seminary (M.Div.).

**Dr. John C. Whitcomb** was president of Whitcomb Ministries, Inc., and founder and professor of Christian Workman Schools of Theology. He was a professor of Old Testament and theology for more than 50 years and is widely recognized as a leading biblical scholar. He went to be with the Lord in 2020.

**Dr. Jason Lisle** is the founder of the Biblical Science Institute. He is a Christian astrophysicist who researches issues pertaining to science and the Christian Faith. A popular speaker and author, Dr. Lisle presents a rational defense of a literal Genesis, showing how science confirms the history recorded in the Bible. Brought up in a Christian family, at a young age he received Christ as Lord. Since then Lisle has always desired to serve the Lord out of love and gratitude for salvation, and to spread the Gospel message to all people.

## Using This Teacher Guide

**Features:** The suggested weekly schedule enclosed has easy-to-manage lessons that guide the reading, worksheets, and all assessments. The pages of this guide are perforated and three-hole punched so materials are easy to tear out, hand out, grade, and store. Teachers are encouraged to adjust the schedule and materials needed in order to best work within their unique educational program.

**Lesson Scheduling:** Students are instructed to read the pages in their book and then complete the corresponding section provided by the teacher. Assessments that may include worksheets, activities, quizzes, and tests are given at regular intervals with space to record each grade. Space is provided on the weekly schedule for assignment dates, and flexibility in scheduling is encouraged. Teachers may adapt the scheduled days per each unique student situation. As the student completes each assignment, this can be marked with an “X” in the box.



**Approximately 30 to 45 minutes per lesson, five days a week**



**Includes answer keys for worksheets and quizzes**



**Worksheets for each chapter**



**Quizzes and tests are included to help reinforce learning and provide assessment opportunities**



**Designed for grades 9 to 12 in a one-year course to earn 1 science credit**



**Suggested labs (if applicable)**

**Course Objectives:** Students completing this course will:

- ✓ Explore numerous evidences that point to a young universe
- ✓ Discover how to choose the best telescope
- ✓ Learn the best ways and optimal times to observe planets and stars
- ✓ Investigate the universe and God’s powerful hand in His created cosmos
- ✓ Identify how the moon could only have been placed in its orbit by an all-knowing, all-powerful Creator
- ✓ Study the facts that challenge secular theories and models of the universe — how it began and how it continues to amaze the scientific community

## Course Description

Students taking this course will tour the universe, marveling at our galaxy through hundreds of beautiful, full-color star charts, easy-to-use illustrations, and even glimpses of the red supergiant star Betelgeuse over 3,000 trillion miles away without the need of binoculars or a telescope. They will also be able to answer questions like: “How do phases of the moon work? When will the next solar eclipse take place? What is that bright star setting in the west? How do I find Saturn? What sorts of objects can be seen with binoculars?” These questions and many more are easily answered with the helpful tips and basic understanding of astronomy presented throughout the materials included in this course. Take a few moments to stand and look up at the glorious night sky, appreciating the majestic beauty of God’s vast universe.

## Scope & Sequence

This full-year high school course (36 weeks, 1 credit) introduces students to astronomy through a biblical lens using *The Stargazer’s Guide to the Night Sky*, *Taking Back Astronomy*, and *Our Created Moon*. Students study the heavens while developing observation skills and understanding how astronomy connects to God’s creation.

- Unit 1 - Foundations (Week 1-2):** Introduction to astronomy, biblical perspectives, tools of observation, scales of the universe.
- Unit 2 – Solar System (Weeks 3–6):** Earth, Moon, planets, dwarf planets, asteroids, comets, and orbital dynamics.
- Unit 3 – The Night Sky (Weeks 7–12):** Constellations, stars, deep sky objects, Milky Way structure, seasonal sky changes, hands-on observation.
- Unit 4 – The Universe & Cosmology (Weeks 13–16):** Galaxies, cosmic structure, theories of origins, creation vs. naturalistic models.
- Unit 5 – Light & Telescopes (Weeks 17–19):** Electromagnetic spectrum, spectroscopy, types of telescopes, detecting celestial phenomena.
- Unit 6 – Celestial Mechanics (Weeks 20–22):** Laws of motion, gravity, orbits, tides, and planetary interactions.
- Unit 7 – Sun & Stars (Weeks 23–26):** Solar structure, nuclear fusion, stellar classification, life cycles of stars, supernovae, black holes.
- Unit 8 – Labs & Review (Weeks 27–36):** Observations, special topics (exoplanets, recent discoveries), projects, cumulative review, and assessments.

## Suggested Optional Science Labs

There are a variety of companies that offer science labs that complement our courses. These items are only suggestions, not requirements, and they are not included in the daily schedule. We have tried to find materials that are free of evolutionary teaching, but please review any materials prior to presentation. The following items are available from [www.HomeTrainingTools.com](http://www.HomeTrainingTools.com). A good telescope is highly recommended.

## First Semester Suggested Daily Schedule

Date	Day	Assignment	Due Date	✓	Grade
First Semester—First Quarter					
Week 1	Day 1	Read Pages 4–5 • <i>The Stargazer's Guide to the Night Sky</i> • (SGNS)			
	Day 2	Introduction — Short Answers <b>Stargazer Introduction: Worksheet 1</b> • Pages 15–16 Teacher Guide • (TG)			
	Day 3	Read Pages 6–10 • (SGNS)			
	Day 4	Motions in the Sky — Basic — Short Answers <b>Stargazer Ch1: Worksheet 1</b> • Pages 17–18 • (TG)			
	Day 5	Read Pages 11–15 • (SGNS)			
Week 2	Day 6	Motions in the Sky — Basic — Short Answers <b>Stargazer Ch1: Worksheet 2</b> • Pages 19–20 • (TG)			
	Day 7	Read Pages 16–20 • (SGNS)			
	Day 8	Motions in the Sky — Basic — Short Answers <b>Stargazer Ch1: Worksheet 3</b> • Pages 21–22 • (TG)			
	Day 9	Read Pages 21–23 • (SGNS)			
	Day 10	Motions in the Sky — Basic — Short Answers <b>Stargazer Ch1: Worksheet 4</b> • Pages 23–24 • (TG)			
Week 3	Day 11	Read Pages 24–27 • (SGNS)			
	Day 12	Motions in the Sky — Advanced — Short Answers <b>Stargazer Ch2: Worksheet 1</b> • Pages 25–26 • (TG)			
	Day 13	Read Pages 28–33 • (SGNS)			
	Day 14	Motions in the Sky — Advanced — Short Answers <b>Stargazer Ch2: Worksheet 2</b> • Pages 27–28 • (TG)			
	Day 15	Read Pages 34–37 • (SGNS)			
Week 4	Day 16	Motions in the Sky — Advanced — Short Answers <b>Stargazer Ch2: Worksheet 3</b> • Page 29 • (TG)			
	Day 17	Read Pages 38–41 • (SGNS)			
	Day 18	Motions in the Sky — Advanced — Short Answers <b>Stargazer Ch2: Worksheet 4</b> • Page 31 • (TG)			
	Day 19	<b>The Stargazer's Guide to the Night Sky: Chapters 1–2 Quiz</b> Pages 183–186 • (TG)			
	Day 20	Read Pages 42–47 • (SGNS)			
Week 5	Day 21	Understanding the Eye — Short Answers <b>Stargazer Ch3: Worksheet 1</b> • Page 33 • (TG)			
	Day 22	Read Pages 48–53 • (SGNS)			
	Day 23	Astronomy with the Unaided Eye — Short Answers <b>Stargazer Ch4: Worksheet 1</b> • Page 35 • (TG)			
	Day 24	Read Pages 54–61 • (SGNS)			
	Day 25	Astronomy with the Unaided Eye — Short Answers <b>Stargazer Ch4: Worksheet 2</b> • Page 37 • (TG)			

Date	Day	Assignment	Due Date	✓	Grade
Week 6	Day 26	Read Pages 62–69 • (SGNS)			
	Day 27	Astronomy with the Unaided Eye — Short Answers <b>Stargazer Ch4: Worksheet 3 • Page 39 • (TG)</b>			
	Day 28	<b>The Stargazer’s Guide to the Night Sky: Chapters 3–4 Quiz</b> Pages 187–188 • (TG)			
	Day 29	Read Pages 70–74 • (SGNS)			
	Day 30	Celestial Events — Short Answers <b>Stargazer Ch5: Worksheet 1 • Page 41 • (TG)</b>			
Week 7	Day 31	Read Pages 75–79 • (SGNS)			
	Day 32	Celestial Events — Short Answers <b>Stargazer Ch5: Worksheet 2 • Page 43 • (TG)</b>			
	Day 33	Read Pages 80–83 • (SGNS)			
	Day 34	Celestial Events — Short Answers <b>Stargazer Ch5: Worksheet 3 • Page 45 • (TG)</b>			
	Day 35	Read Pages 84–87 • (SGNS)			
Week 8	Day 36	Celestial Events — Short Answers <b>Stargazer Ch5: Worksheet 4 • Page 47 • (TG)</b>			
	Day 37	Read Pages 88–91 • (SGNS)			
	Day 38	Telescope Basics — Short Answers <b>Stargazer Ch6: Worksheet 1 • Page 49 • (TG)</b>			
	Day 39	Read Pages 92–96 • (SGNS)			
	Day 40	Telescope Basics — Short Answers <b>Stargazer Ch6: Worksheet 2 • Page 51 • (TG)</b>			
Week 9	Day 41	Read Pages 97–100 • (SGNS)			
	Day 42	Telescope Basics — Short Answers <b>Stargazer Ch6: Worksheet 3 • Page 53 • (TG)</b>			
	Day 43	Read Pages 101–105 • (SGNS)			
	Day 44	Telescope Basics — Short Answers <b>Stargazer Ch6: Worksheet 4 • Page 55 • (TG)</b>			
	Day 45	<b>The Stargazer’s Guide to the Night Sky: Chapters 5–6 Quiz</b> Pages 189–190 • (TG)			
First Semester–Second Quarter					
Week 1	Day 46	Read Pages 106–108 • (SGNS)			
	Day 47	Telescope Observing Sessions — Short Answers <b>Stargazer Ch7: Worksheet 1 • Page 57 • (TG)</b>			
	Day 48	Read Pages 109–115 • (SGNS)			
	Day 49	Telescope Observing Sessions — Short Answers <b>Stargazer Ch7: Worksheet 2 • Page 59 • (TG)</b>			
	Day 50	Read Pages 116–121 • (SGNS)			

Date	Day	Assignment	Due Date	✓	Grade
Week 2	Day 51	Telescope Observing Sessions — Short Answers <b>Stargazer Ch7: Worksheet 3 • Page 61 • (TG)</b>			
	Day 52	Read Pages 122–127 • (SGNS)			
	Day 53	The Moon and the Sun — Short Answers <b>Stargazer Ch8: Worksheet 1 • Page 63 • (TG)</b>			
	Day 54	Read Pages 128–133 • (SGNS)			
	Day 55	The Moon and the Sun — Short Answers <b>Stargazer Ch8: Worksheet 2 • Page 65 • (TG)</b>			
Week 3	Day 56	<b>The Stargazer’s Guide to the Night Sky: Chapters 7–8 Quiz</b> Pages 191 • (TG)			
	Day 57	Read Pages 134–138 • (SGNS)			
	Day 58	The Planets — Short Answers <b>Stargazer Ch9: Worksheet 1 • Page 67 • (TG)</b>			
	Day 59	Read Pages 139–143 • (SGNS)			
	Day 60	The Planets — Short Answers <b>Stargazer Ch9: Worksheet 2 • Page 69 • (TG)</b>			
Week 4	Day 61	Read Pages 144–148 • (SGNS)			
	Day 62	The Planets — Short Answers <b>Stargazer Ch9: Worksheet 3 • Page 71 • (TG)</b>			
	Day 63	Read Pages 149–152 • (SGNS)			
	Day 64	The Planets — Short Answers <b>Stargazer Ch9: Worksheet 4 • Page 73 • (TG)</b>			
	Day 65	Read Pages 153–157 • (SGNS)			
Week 5	Day 66	The Planets — Short Answers <b>Stargazer Ch9: Worksheet 5 • Page 75 • (TG)</b>			
	Day 67	Read Pages 158–163 • (SGNS)			
	Day 68	The Planets — Short Answers <b>Stargazer Ch9: Worksheet 6 • Page 77 • (TG)</b>			
	Day 69	Read Pages 164–167 • (SGNS)			
	Day 70	Star Classifications and Telescope Viewing — Short Answers <b>Stargazer Ch10: Worksheet 1 • Page 79 • (TG)</b>			
Week 6	Day 71	Read Pages 168–175 • (SGNS)			
	Day 72	Star Classifications and Telescope Viewing — Short Answers <b>Stargazer Ch10: Worksheet 2 • Page 81 • (TG)</b>			
	Day 73	<b>The Stargazer’s Guide to the Night Sky: Chapters 9–10 Quiz</b> Pages 193–194 • (TG)			
	Day 74	Read Pages 176–189 • (SGNS)			
	Day 75	Deep Sky Objects — Short Answers <b>Stargazer Ch11: Worksheet 1 • Page 83 • (TG)</b>			
Week 7	Day 76	Read Pages 190–196 • (SGNS)			
	Day 77	Deep Sky Objects — Short Answers <b>Stargazer Ch11: Worksheet 2 • Page 85 • (TG)</b>			
	Day 78	Read Pages 197–203 • (SGNS)			
	Day 79	Deep Sky Objects — Short Answers <b>Stargazer Ch11: Worksheet 3 • Page 87 • (TG)</b>			
	Day 80	Read Pages 204–211 • (SGNS)			

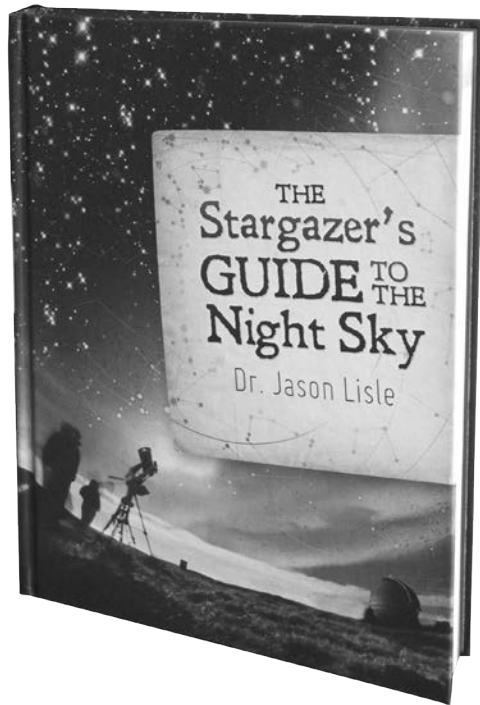
Date	Day	Assignment	Due Date	✓	Grade
Week 8	Day 81	Deep Sky Objects — Short Answers <b>Stargazer Ch11: Worksheet 4</b> • Page 89 • (TG)			
	Day 82	Read Pages 212–221 • (SGNS)			
	Day 83	Deep Sky Objects — Short Answers <b>Stargazer Ch11: Worksheet 5</b> • Page 91 • (TG)			
	Day 84	Read Pages 222–227 • (SGNS)			
	Day 85	Astrophotography — Short Answers <b>Stargazer Ch12: Worksheet 1</b> • Page 93 • (TG)			
Week 9	Day 86	Read Pages 228–233 • (SGNS)			
	Day 87	Astrophotography — Short Answers <b>Stargazer Ch12: Worksheet 2</b> • Page 95 • (TG)			
	Day 88	Read Pages 234–235 • (SGNS)			
	Day 89	The Relevance of Astronomy — Short Answers <b>Stargazer Afterword: Worksheet 1</b> • Page 97 • (TG)			
	Day 90	<b>Stargazer's Guide to the Night Sky: Chapters 11–12 Quiz</b> Pages 195 • (TG)			
		Mid-Term Grade			

Date	Day	Assignment	Due Date	✓	Grade
Second Semester–Third Quarter					
Week 1	Day 91	Read Page 6 • <i>Our Created Moon</i> • (OCM)			
	Day 92	Read Pages 7–10 • (OCM)			
	Day 93	Our Nearest Neighbor — Questions, Activities <b>Our Created Moon Ch1: Worksheet 1</b> • Pages 101–102 • (TG)			
	Day 94	Read pages 11–13 • (OCM)			
	Day 95	Read Pages 14–15 • (OCM)			
Week 2	Day 96	Our Nearest Neighbor — Questions, Activities <b>Our Created Moon Ch1: Worksheet 2</b> • Pages 103–106 • (TG)			
	Day 97	Read Pages 16–21 • (OCM)			
	Day 98	Our Nearest Neighbor — Questions, Activities <b>Our Created Moon Ch1: Worksheet 3</b> • Pages 107–110 • (TG)			
	Day 99	Read Pages 22–25 • (OCM)			
	Day 100	Our Nearest Neighbor — Questions, Activities <b>Our Created Moon Ch1: Worksheet 4</b> • Pages 111–112 • (TG)			
Week 3	Day 101	Read Pages 26–28 • (OCM)			
	Day 102	Our Nearest Neighbor — Questions, Activities <b>Our Created Moon Ch1: Worksheet 5</b> • Pages 113–114 • (TG)			
	Day 103	<b>Our Created Moon: Chapter 1 Quiz</b> Pages 197–200 • (TG)			
	Day 104	Read Pages 29–32 • (OCM)			
	Day 105	History of the Moon — Questions, Activities <b>Our Created Moon Ch2: Worksheet 1</b> • Pages 115–116 • (TG)			

Date	Day	Assignment	Due Date	✓	Grade
Week 4	Day 106	Read Pages 33–36 • (OCM)			
	Day 107	History of the Moon — Questions, Activities <b>Our Created Moon Ch2: Worksheet 2</b> • Pages 117–118 • (TG)			
	Day 108	Read Pages 37–39 • (OCM)			
	Day 109	History of the Moon — Questions, Activities <b>Our Created Moon Ch2: Worksheet 3</b> • Pages 119–120 • (TG)			
	Day 110	Read Pages 40–43 • (OCM)			
Week 5	Day 111	History of the Moon — Questions, Activities <b>Our Created Moon Ch2: Worksheet 4</b> • Pages 121–124 • (TG)			
	Day 112	Read Pages 44–46 • (OCM)			
	Day 113	History of the Moon — Questions, Activities <b>Our Created Moon Ch2: Worksheet 5</b> • Pages 125–126 • (TG)			
	Day 114	Read Pages 47–49 • (OCM)			
	Day 115	Purposes of the Moon — Questions, Activities <b>Our Created Moon Ch3: Worksheet 1</b> • Pages 127–128 • (TG)			
Week 6	Day 116	Read Pages 50–54 • (OCM)			
	Day 117	Purposes of the Moon — Questions, Activities <b>Our Created Moon Ch3: Worksheet 2</b> • Pages 129–132 • (TG)			
	Day 118	Read Pages 55–58 • (OCM)			
	Day 119	Purposes of the Moon — Questions, Activities <b>Our Created Moon Ch3: Worksheet 3</b> • Pages 133–134 • (TG)			
	Day 120	<b>Our Created Moon: Chapters 2–3 Quiz</b> Pages 201–204 • (TG)			
Week 7	Day 121	Read Pages 59–62 • (OCM)			
	Day 122	The Moon in Scripture — Questions, Activities <b>Our Created Moon Ch4: Worksheet 1</b> • Pages 135–136 • (TG)			
	Day 123	Read Pages 63–67 • (OCM)			
	Day 124	The Moon in Scripture — Questions, Activities <b>Our Created Moon Ch4: Worksheet 2</b> • Pages 137–138 • (TG)			
	Day 125	Read Pages 68–72 • (OCM)			
Week 8	Day 126	The Moon in Scripture — Questions, Activities <b>Our Created Moon Ch4: Worksheet 3</b> • Pages 139–140 • (TG)			
	Day 127	Read Pages 73–77 • (OCM)			
	Day 128	Answering the Critics — Questions, Activities <b>Our Created Moon Ch5: Worksheet 1</b> • Pages 141–142 • (TG)			
	Day 129	Read Pages 78–81 • (OCM)			
	Day 130	Answering the Critics — Questions, Activities <b>Our Created Moon Ch5: Worksheet 2</b> • Pages 143–144 • (TG)			
Week 9	Day 131	Read Pages 82–84 • (OCM)			
	Day 132	Answering the Critics — Questions, Activities <b>Our Created Moon Ch5: Worksheet 3</b> • Pages 145–146 • (TG)			
	Day 133	Read Pages 85–87 • (OCM)			
	Day 134	Observing & Living on the Moon — Questions, Activities <b>Our Created Moon Appx1–2: Worksheet 1</b> Pages 147–148 • (TG)			
	Day 135	<b>Our Created Moon: Chapters 4–5 Quiz</b> Pages 205–208 • (TG)			

Date	Day	Assignment	Due Date	✓	Grade
Second Semester–Fourth Quarter					
Week 1	Day 136	Read Pages 6-7 • <i>Taking Back Astronomy</i> • (TBA)			
	Day 137	Read Pages 8–13 • (TBA)			
	Day 138	Introduction — Questions <b>Taking Back Intro: Worksheet 1</b> • Page 151 • (TG)			
	Day 139	Introduction — Activities <b>Taking Back Intro: Worksheet 1</b> • Page 152 • (TG)			
	Day 140	Read Pages 14–19 • (TBA)			
Week 2	Day 141	The Splendor of God’s Creation — Questions, Activities <b>Taking Back Ch1: Worksheet 1</b> • Pages 153–154 • (TG)			
	Day 142	Read Pages 20–25 • (TBA)			
	Day 143	The Splendor of God’s Creation — Questions, Activities <b>Taking Back Ch1: Worksheet 2</b> • Pages 155–156 • (TG)			
	Day 144	Read Pages 26–31 • (TBA)			
	Day 145	The Universe Confirms the Bible — Questions, Activities <b>Taking Back Ch2: Worksheet 1</b> • Pages 157–158 • (TG)			
Week 3	Day 146	Read Pages 32–39 • (TBA)			
	Day 147	The Universe Confirms the Bible — Questions, Activities <b>Taking Back Ch2: Worksheet 2</b> • Pages 159–160 • (TG)			
	Day 148	Study for Quiz			
	Day 149	<b>Taking Back Astronomy: Chapters 1–2 Quiz</b> Pages 209–210 • (TG)			
	Day 150	Read Pages 40–45 • (TBA)			
Week 4	Day 151	The Age of the Universe — Questions, Activities <b>Taking Back Ch3: Worksheet 1</b> • Pages 161–162 • (TG)			
	Day 152	Read Pages 46–50 • (TBA)			
	Day 153	The Age of the Universe — Questions, Activities <b>Taking Back Ch3: Worksheet 2</b> • Pages 163–164 • (TG)			
	Day 154	Read Pages 51–59 • (TBA)			
	Day 155	The Age of the Universe — Questions <b>Taking Back Ch3: Worksheet 3</b> • Page 165 • (TG)			
Week 5	Day 156	The Age of the Universe — Activities <b>Taking Back Ch3: Worksheet 3</b> • Page 166 • (TG)			
	Day 157	Read Pages 60–65 • (TBA)			
	Day 158	The Age of the Universe — Questions, Activities <b>Taking Back Ch3: Worksheet 4</b> • Pages 167–168 • (TG)			
	Day 159	Read Pages 66–73 • (TBA)			
	Day 160	The Age of the Universe — Questions, Activities <b>Taking Back Ch3: Worksheet 5</b> • Pages 169–170 • (TG)			

Date	Day	Assignment	Due Date	✓	Grade
Week 6	Day 161	Study for Quiz			
	Day 162	<b>Taking Back Astronomy: Chapter 3 Quiz</b> Pages 211–212 • (TG)			
	Day 163	Read Pages 74–79 • (TBA)			
	Day 164	Read Pages 80–84 • (TBA)			
	Day 165	The Bible and Modern Astronomy — Questions <b>Taking Back Ch4: Worksheet 1</b> • Page 171 • (TG)			
Week 7	Day 166	The Bible and Modern Astronomy — Activities <b>Taking Back Ch4: Worksheet 1</b> • Page 172 • (TG)			
	Day 167	Read Pages 85–90 • (TBA)			
	Day 168	The Bible and Modern Astronomy — Questions, Activities <b>Taking Back Ch4: Worksheet 2</b> • Page 173 • (TG)			
	Day 169	Read Pages 91–96 • (TBA)			
	Day 170	Read Pages 97–101 • (TBA)			
Week 8	Day 171	The Bible and Modern Astronomy — Questions <b>Taking Back Ch4: Worksheet 3</b> • Page 175 • (TG)			
	Day 172	The Bible and Modern Astronomy — Activities <b>Taking Back Ch4: Worksheet 3</b> • Page 176 • (TG)			
	Day 173	Read Pages 102–107 • (TBA)			
	Day 174	War of the World Views — Questions <b>Taking Back Ch5: Worksheet 1</b> • Page 177 • (TG)			
	Day 175	War of the World Views — Activities <b>Taking Back Ch5: Worksheet 1</b> • Page 178 • (TG)			
Week 9	Day 176	Read Pages 108–116 • (TBA)			
	Day 177	War of the World Views — Questions <b>Taking Back Ch5: Worksheet 2</b> • Page 179 • (TG)			
	Day 178	War of the World Views — Activities <b>Taking Back Ch5: Worksheet 2</b> • Page 180 • (TG)			
	Day 179	Study for Quiz			
	Day 180	<b>Taking Back Astronomy: Chapters 4–5 Quiz</b> Pages 213–214 • (TG)			
		Final Grade			



**Astronomy Worksheets**

**for Use with**

***The Stargazer's Guide to the Night Sky***



4. Is there a difference in the sky depending on the season?

5. What are the two largest celestial objects we can view?







5. Why is it ironic that the moon is called “the moon” in regards to the gravitational pull of the earth and sun?
6. The phases of the moon are not related to the earth’s shadow, but to the \_\_\_\_\_ of the day side of the moon we can see from our position.
7. It takes \_\_\_\_\_ days for the moon to go through its phases, and \_\_\_\_\_ days for its orbital period.

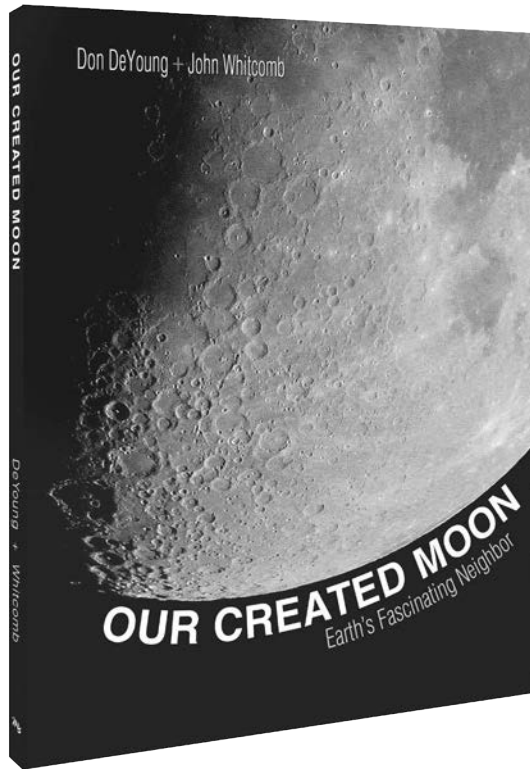


5. \_\_\_\_\_ describes how far along the horizon an object is to the right of due north.

6. Equatorial coordinates are based on the \_\_\_\_\_. In particular, they are based on the celestial \_\_\_\_\_.



5. A star wheel or planisphere helps you find stars by lining up the \_\_\_\_\_ with the \_\_\_\_\_ on the planisphere.
6. A planisphere helps find constellations, but will not help with \_\_\_\_\_ or the \_\_\_\_\_.



**Moon Worksheets**  
**for Use with**  
***Our Created Moon***



8. What is the elusive force that occurs between objects — even over large stretches of empty space — and continues to puzzle scientists?
  
  
  
  
  
  
  
  
  
  
9. What do physical laws say about the universe?
  
  
  
  
  
  
  
  
  
  
10. Who said, “That’s one small step for man; one giant leap for mankind”?

### Discussion Question

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*“If the moon’s tangent speed ceased, it then would fall directly toward the earth and collide with us. On the other hand, if gravity ceased, the moon would leave its Earth orbit on a straight line path like a stone from a whirling slingshot.”* (pg. 10, *Our Created Moon*) Secular science and evolutionary theories often rely on random events over long periods of time to explain the world we see. The Bible tells us that God created everything — including the universe — and it was good. Knowing the precision of how the moon stays in the sky, what do you think about these two opposing worldviews in explaining the moon? What details from what you have read so far support your answer?

### Bonus Activity

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Research Newton’s law of universal gravitation. How does this help us understand the effects of gravity? What do you need to know to use the following formula to determine the gravity force between two objects?

$$F = G \frac{m_1 \times m_2}{r^2}$$

- ⇒ F is the \_\_\_\_\_.
- ⇒ G is the \_\_\_\_\_.
- ⇒  $m_1$  is the \_\_\_\_\_.
- ⇒  $m_2$  is the \_\_\_\_\_.
- ⇒ r is the \_\_\_\_\_.



5. Why is the moon also referred to as a “secondary” or “double planet” companion to earth?
  
  
  
  
  
  
  
  
  
  
6. Why do we see only one side of the moon?
  
  
  
  
  
  
  
  
  
  
7. What are some of the previous theories on what created lunar craters? What is the predominant idea of their origin today?
  
  
  
  
  
  
  
  
  
  
8. How many estimated craters are thought to be on the moon, larger than one kilometer in size?
  
  
  
  
  
  
  
  
  
  
9. How does the lack of an atmosphere tie in with the presence of the craters?
  
  
  
  
  
  
  
  
  
  
10. There are impact craters on earth, but they don't look the same as those on the moon. Why?
  
  
  
  
  
  
  
  
  
  
11. What are three varieties of moon rocks that have been collected?



19. What shape are lunar rocks?

20. What do the small bright beads of colored glass in the lunar soil indicate?

### **Discussion Question**

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Although it cannot produce light on its own, how is the moon's ability as a reflector critical in understanding Genesis 1:16?

### **Bonus Activities**

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1. Research lunar mass. Can you find the answer to the following equation? Why are complex equations like this one vital to the success of the space program?

1 lunar mass = \_\_\_\_\_ x \_\_\_\_\_ kilograms

2. Research the moon as a reflector. Are there substances on the moon's surface that help to reflect light or is the sheer size of the moon and the intensity of sunlight what makes the moonlight bright?



8. Why is abiogenesis not a realistic expectation for life to occur?
9. Is there biblical support for life in space beyond that on Earth?
10. What causes the moon phases?
11. In what Bible verses is the new moon mentioned?
12. Were some Old Testament festivals timed with the phases of the moon?
13. What do the moon phases affect here on earth?
14. What is the cause for the high spring tides?
15. Though not proven, what other things are often attributed to the moon and its phases?
16. When does a lunar eclipse occur?
17. How often do lunar eclipses occur?

18. What is a solar eclipse?
  
19. Why don't lunar and solar eclipses happen every month?
  
20. How long does a total eclipse last?
  
21. What causes the earth's tides?
  
22. How does the moon's proximity to one side of the earth or the other impact tides?
  
23. How quickly can the tidal bulge move at the earth's equator?
  
24. Does the moon's gravity affect the crust of the earth?
  
25. In what quarters of the moon's phases do neap tides occur?

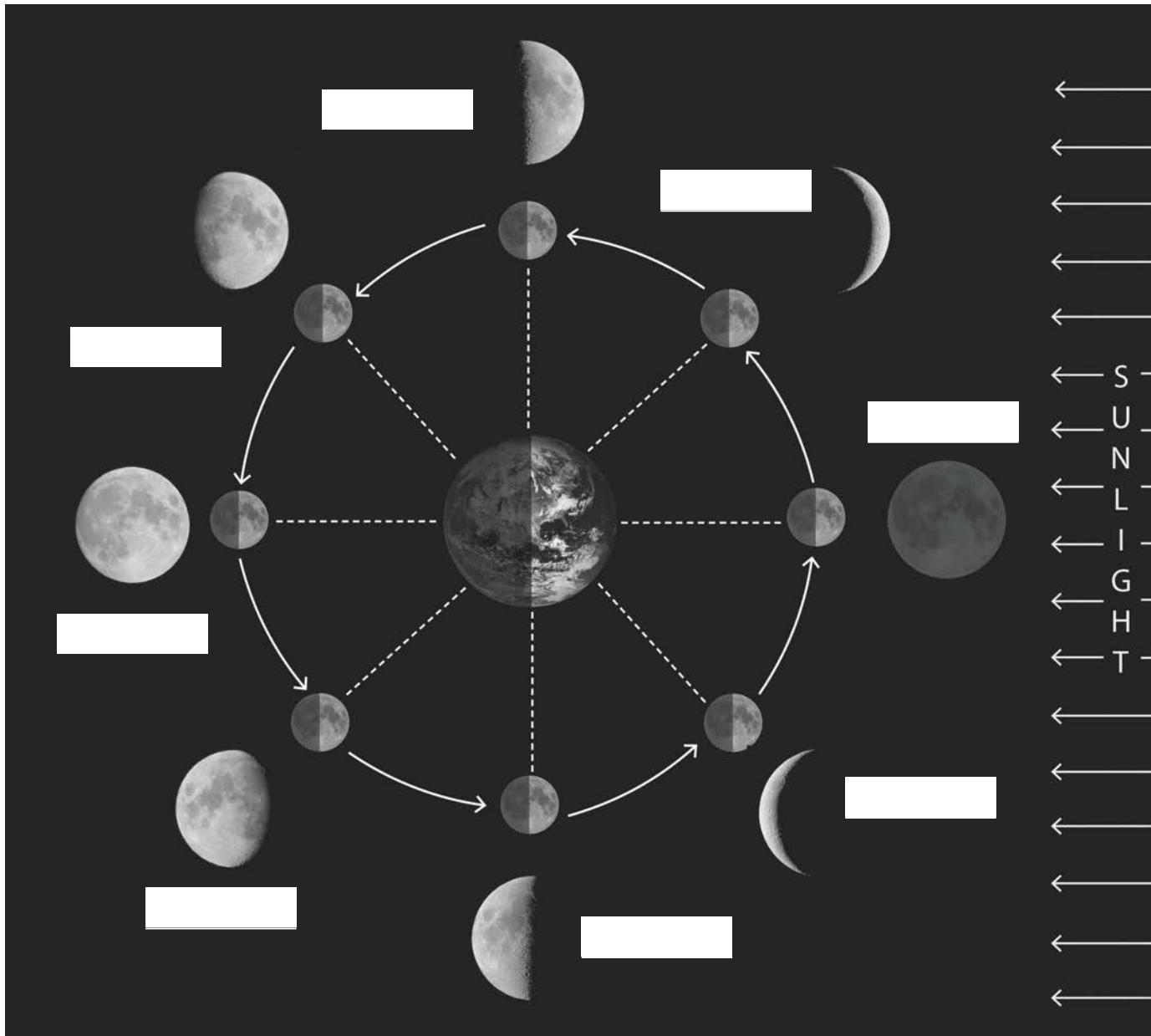
### **Discussion Question**

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Explain how the size and relative distance of the moon and the sun can help eclipses to occur.

## Bonus Activities

1. Research the latest findings on the question of whether or not the moon has water at [www.nasa.gov](http://www.nasa.gov). Why is water an important component of potential future missions to the moon?
2. Identify the various phases of the moon.





8. When were Jupiter's largest moons discovered and by whom?
  
  
  
  
  
  
  
  
  
  
9. Are there marked similarities among the moons of our solar system that would suggest a common spontaneous origin?
  
  
  
  
  
  
  
  
  
  
10. Which American president began NASA in order to study the possibilities of space exploration?

### **Discussion Questions**

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1. What global pressures helped to initiate the Apollo space program's moon exploration? How did these factors help or hurt space exploration in your opinion?
  
  
  
  
  
  
  
  
  
  
2. After reading the facts about NASA on page 25 of *Our Created Moon*, do any of the facts change some misconception you have had about the history, purpose, and events of NASA missions?

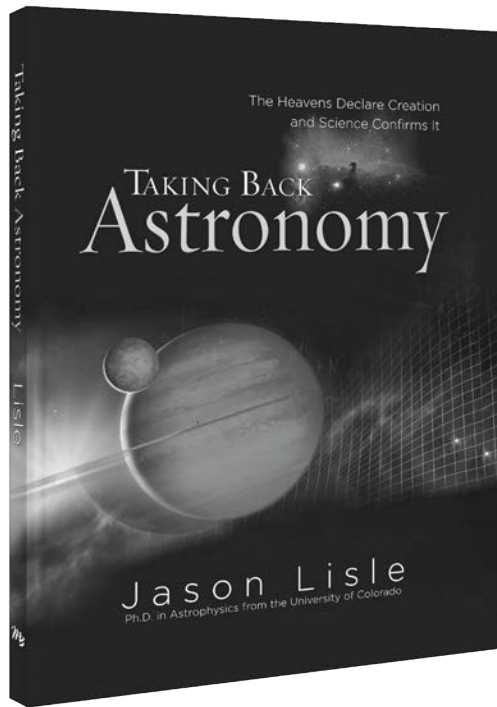
### **Bonus Activity**

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Create an informative chart and detail key factors of the Apollo Missions to the moon, or choose a particular manned Apollo mission to the moon and write a two-page essay about some aspect of the mission.







**Astronomy Worksheets**  
**for Use with**  
***Taking Back Astronomy***



## Words to Know

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worldview

naturalism

big bang

nebular accretion

## Short Answer Questions

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1. A worldview is really a kind of \_\_\_\_\_. It prevents us from being objective and “open-minded” about certain things.
2. A correct worldview can help us draw \_\_\_\_\_ about the evidence.
3. The Bible claims to be the \_\_\_\_\_.
4. Ultimately, we can base our beliefs about origins on the Word of God, or the speculations of other \_\_\_\_\_.
5. The Bible provides a \_\_\_\_\_ for the interpretation of scientific evidence in the field of astrophysics, as it does for other areas of science.

## Discussion Questions

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1. Discuss why the creation versus evolution debate is not primarily about science, but instead about worldviews.
  
  
  
  
  
  
  
  
  
  
2. What do you think it means to have the “mind of Christ”? How would having the mind of Christ affect your worldview?

## Activities

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Use your Bible to answer the following questions. Include at least one Scripture reference with each answer.

How was the universe formed?

When was the universe formed?

Where did mankind come from?

Why am I here?

Why is there so much pain and death in the world?

What is the definition of truth?



## Activities

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Write a one-page essay on one of the following prompts:

a. How do you feel when confronted with the amazing supernatural power of the Creator?

b. How do you believe the universe declares the glory of God?



## Words to Know

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nebula

galaxy

Virgo Cluster

Local Group

## Short Answer Questions

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1. When a nebula is heated by \_\_\_\_\_, it glows, often with vivid and beautiful colors.
2. The Milky Way belongs to a cluster of galaxies called the \_\_\_\_\_.
3. The sun gives off more energy every second than one billion major cities would produce in \_\_\_\_\_.
4. God has created innumerable galaxies with a wide range of shapes and sizes. Clusters of galaxies are organized into even larger bodies called \_\_\_\_\_.
5. How many stars are estimated to be in the Milky Way?

## Discussion Questions

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1. Read Psalm 8, 1 Peter 5:7, Luke 12:7, John 3:16. Discuss how it makes you feel to know that this same God cares about you individually.
  
  
  
  
  
  
  
  
  
  
2. After reading these pages, we get an idea that the universe is so vast that it is beyond our ability to comprehend, yet Genesis 1:16 states simply that God "also made the stars." Why do you think the Bible speaks more about God's plan for mankind than of all His other created works?

## Activity

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Memorize Psalm 8:3–4.

**Worksheet Answer Keys**  
**to**  
***Survey of Astronomy***

# **The Stargazer's Guide to the Night Sky — Worksheet Answer Keys**

## **Introduction – Worksheet 1**

1. Answers will vary.
2. With your eyes alone, with binoculars, or with a telescope.
3. Yes. There are many similarities, but star charts can vary.
4. Yes. The book includes star charts depending on the seasonal skies.
5. The moon and the sun.

## **Chapter 1 – Worksheet 1**

1. This is because of the earth's rotation on its axis; because the earth is spinning in the opposite direction.
2. It is called "diurnal motion."
3. It is an approximate 24-hour cycle.
4. It is called the "celestial sphere."
5. It is called the "celestial equator."
6. They are called "circumpolar" constellations.
7. Sidereal day

## **Chapter 1 – Worksheet 2**

1. The sidereal day is the true rotation rate of Earth as seen from a distant star. The solar day is how long it takes for the sun to return to its highest point in the sky as viewed from a location on Earth.
2. 12
3. It washes out nearly everything else in the sky.
4. 50 minutes
5. The gravitational pull of the sun on the moon is about twice the pull of the earth on the moon.
6. percentage
7. 29.3, 27.5

## **Chapter 1 – Worksheet 3**

1. true motion, apparent shift
2. The earth's rotation axis that is tilted relative to its orbit around the sun by 23.4 degrees.

3. The first is based on our local horizon. The second is based on the celestial sphere.
4. Altitude
5. Azimuth
6. celestial sphere, equator

## **Chapter 1 – Worksheet 4**

1. south, north
2. day, year
3. setting
4. It's best to get outside and watch.
5. date, time
6. planets, moon

## **Chapter 2 – Worksheet 1**

1. declination, 12
2. It means "equal night."
3. It means "sun stop."
4. Arctic
5. Spring/summer, fall/winter
6. Ecliptic

## **Chapter 2 – Worksheet 2**

1. On the spring equinox
2. Solar, lunar
3. Node
4. Saros
5. Umbra, penumbra
6. Photosphere
7. 400

## **Chapter 2 – Worksheet 3**

1. Annulus
2. Libration
3. Elliptical
4. Superior
5. Conjunction

# Our Created Moon — Worksheet Answer Keys

## Chapter 1 – Worksheet 1

1. Any natural satellite that orbits a planet that holds it captive by the planet's gravity force. It moves in a continuous elliptical orbit.
2. Answers will vary depending on version of Bible used. For example, "The lesser light that rules the night," which is from the NKJV.
3. *hōdesh, ya-reah, lebana*
4. *selene*; white one
5. Answers can vary: between 225,600 and 251,815 miles, with an average of 238,712 miles (384,090 km); 238,712 miles (center to center); 384,090 km; a light travel time of 1.3 seconds; a three-day trip for Apollo astronauts; at 60 mph the trip would take 52 months; equal to ten trips around the world; 400 times closer than the sun.
6. Answers can vary but should focus around the combination of gravity and the orbit in combination helping keep the moon in orbit; for example: the moon's tangent speed and falling motion add together to result in a smooth, curving orbit around the earth.
7. Center-seeking
8. Gravity
9. Answer will vary — should refer to orderliness and also being constant. It is not something that changes over time but has been in existence since the beginning.
10. Neil Armstrong

### Discussion Question

Answers will vary.

### Bonus Activity

force between the masses

gravitational constant (see if you can find this calculation in your research)

first mass

second mass

distance between the centers of the masses

## Chapter 1 – Worksheet 2

**breccias** — rocks composed of small rock fragments,

glass, and soil that have been compacted into cohesive rocks

**libration** — the "rocking" slightly back and forth of the moon in orbit

**lowlands** — large, flat areas that cover one-half of the moon's visible side

**lunar eclipse** — occurs when the earth is lined up exactly between the sun and moon

**lunar highlands** — rugged mountain ranges that appear from earth as light-colored patches

**regolith** — the general lunar surface collection of dust, pebbles, and boulders

**sidereal period** — the moon's rotation time with respect to the stars (approximately 27½ days)

**synodic period** — the time from one full moon to the next (approximately 29⅓ days)

1. Answers may vary: one-quarter the size of earth; diameter of 2,160 miles or 3,475 km; 81 times smaller than the earth
2. Fulcrum
3. It refers to a moment-by-moment analysis in terms of physics and is about the ever-changing center-of-mass position. It changes depending on the position of the various objects.
4. Answers can vary but should be related to the ratio or proportion of the moon compared to earth. Our moon is considered large in terms of proportion of size in ratio to earth when compared to other planets with moons in our solar system.
5. Because most lunar masses are less than 0.025 percent of their planets or less than 5 percent of the diameter of their planets. When you consider the size of the earth, our moon is very large in comparison.
6. Because of its orbit — it rotates once on its axis during the same time it orbits the earth.
7. Volcanic activity, giant gas bubbles, and collapsed sinkholes; impact craters
8. 200,000 craters
9. Answers may vary in wording but should note that without an atmosphere for them to burn up

23. 1,000 miles per hour
24. Yes
25. First and last quarter

*Discussion Question*

Answers will vary. Should focus on the size of the moon and the sun in relation to one another and the earth, as well as their distances to earth that allow them to appear to be the same size in the sky.

*Bonus Activities*

1. Answers will vary.

Counter clockwise from the right

1. New
2. Waxing Crescent
3. First Quarter
4. Waxing Gibbous
5. Full
6. Waning Gibbous
7. Third Quarter
8. Waning Crescent

**Chapter 1 – Worksheet 4**

1. 21
2. President John F. Kennedy
3. This means people are onboard for the duration of the space mission.
4. Three-stage, 360 feet long, generating 7.5 million pounds of thrust on liftoff
5. Sea of Tranquility
6. Apollo 17 in 1972; lunar reflectors and continued study of moon rocks
7. Phobos and Deimos
8. 1610 by Galileo
9. No — each is unique.
10. President Woodrow Wilson

*Discussion Questions*

1. Answer will vary, but should take into account the Cold War or the technological competition between the United States and the Soviet Union.
2. Answers will vary.

**Chapter 1 – Worksheet 5**

1. Yes

2. Because it creates the possibility of a manned lunar base or hydrogen fuel for spacecraft launches on the moon
3. Deliberately crashing two probes into the lunar surface
4. No — and especially not in all three states
5. Some felt frozen water might have accumulated there deep within craters that are not reached by sunlight and it is persistently cold.
6. The idea was given up when the Apollo astronauts found a sterile, lifeless lunar surface.
7. About three-quarters
8. That the earth is unique.
9. Apollo 13
10. 60 to 70 hours

*Discussion Question*

Answers will vary, but the moon must be identified by name, the planet it orbits, and what features factored in making this choice.

**Chapter 2 – Worksheet 1**

**accretion** — a growth of the earth and its moon from dust and gas occurring side by side in space

**Roche limit** — breakup of a moon occurs within about 2.44 planetary radii of its host planet

1. Fission or splitting off of material from earth; capture of an external moon by the earth's gravity; condensation of nebulous gas and dust at the same time
2. A theory that the earth was once molten and spinning rapidly, a growing tidal bulge was occurring because of the sun, which was eventually thrown or fissioned from the earth to form the moon; one of Charles Darwin's sons was a champion of this idea.
3. Rotation time of the earth would need to be ten times more than it currently is; the moon's composition materials are different than those of earth; the moon's orbit doesn't match what it should if this theory were viable; it could not have survived intact within the Roche limit.
4. A wandering moon passed too close to earth, and it was captured in the earth's gravitation; it isn't really explaining the origin of the moon

# Taking Back Astronomy — Worksheet Answer Keys

## Introduction, Worksheet 1

**worldview** — a particular philosophy of life or conception of the world; the Christian worldview is based on the Bible.

**naturalism** — a philosophical viewpoint according to which everything arises from natural properties and causes, and supernatural or spiritual explanations are excluded or discounted

**big bang** — secular theory of the origin of the universe which proposes that all mass, energy, and space were contained in a point which rapidly expanded to become stars and galaxies over billions of years

**nebular accretion** — a part of the nebular hypothesis by which celestial bodies allegedly formed when gas and dust particles coalesced in a process called accretion, forming protoplanets or planetesimals

1. bias
  2. correct conclusions
  3. authoritative Word of God
  4. human beings
  5. logical foundation
1. The debate is really about which interpretation of the evidence is best. Both creationists and evolutionists examine the same evidence and study the same principles of genetics, chemistry, and physics. They draw different conclusions about origins because they have different worldviews.
  2. Answers will vary, but a good place to start the discussion would be that having the mind of Christ implies that one would think, love, and live like Christ. As we grow in our knowledge and understanding of Christ and the Bible we will gain a deeper understanding of our worldview.

Activities – Here is one Scripture verse that addresses each question, but many more can be found!

How was the universe formed? Genesis 1:1

When was the universe formed? Exodus 20:11

Where did mankind come from? Genesis 1:27

Why am I here? Isaiah 43:7

Why is there so much pain and death in the world?  
Romans 5:12

What is the definition of truth? John 14:6

## Chapter 1, Worksheet 1

**angular size** — the angular size or diameter of an object refers to the size that it appears to be. Angular size is normally defined as an angle in proportion to the object's actual size divided by the distance from which it is observed

**fusion** — a nuclear reaction in which the nuclei of atoms combine to form more massive nuclei which releases energy in the process

1. moon
2. stars, hydrogen gas
3. helium
4. night, day
5. Milky Way

1. According to Psalm 19:1, the universe reveals the majesty of the Creator. God also created the celestial bodies to be for signs, seasons, days, and years (Gen. 1:14).
2. The sun is about 400 times more distant than the moon and, remarkably, it is also 400 times larger than the moon thus making both celestial bodies appear to be the same size. This is an example of angular size.

Activities — Answers will vary.

## Chapter 1, Worksheet 2

**nebula** — a cloud in outer space made of hydrogen gas

**galaxy** — a system of millions or billions of stars, together with gas and dust, held together by gravitational attraction

**Virgo Cluster** — the massive cluster of about 2,000 galaxies that lies in the constellation Virgo

**Local Group** — the cluster of a few dozen galaxies of which our galaxy is a member

1. nearby stars
2. Local Group
3. one year
4. superclusters
5. 100 billion

1. Discussions will vary.
2. Discussions will vary but the student should understand that mankind is God's crowning achievement, His masterpiece, and should understand that every person is precious and important to Him. Suggested Scriptures: Ephesians 2:10, Psalm 139:13-14.

## Chapter 2, Worksheet 1

**astronomy** — the branch of science that deals with celestial objects, space, and the physical universe as a whole

**astrophysics** — the branch of astronomy concerned with the physical nature of stars and other celestial bodies, and the application of the laws and theories of physics to the interpretation of astronomical observations

**terminator** — the dividing line between the light and dark part of a planetary body

**redshift** — the displacement of spectral lines toward longer wavelengths (the red end of the spectrum) in radiation from the distant galaxies and celestial objects

**Pythagoras** — Greek philosopher known as Pythagoras of Samos. He sought to interpret the entire physical world in terms of numbers and founded their systematic and mystical study. He is best known for the theorem of the right-angled triangle.

**general relativity** — a theory of gravitation developed by Albert Einstein in which gravity is described as a geometrical curvature in space and time. One prediction of this theory is that gravitational fields slow the passage of time — a phenomenon that has been verified using atomic clocks.

1. Isaiah 40:22, Job 26:10
2. 70%
3. Doppler effect
4. distance

## 5. Hubble law

1. Most astronomers believe that expansion of the universe is the most likely cause for redshifting because expansion would naturally lead to this result. More distant galaxies would be more redshifted because their light has been traveling longer and has thus been expanded by a greater amount. The Hubble law is the evidence — distant galaxies show greater redshifts than nearby galaxies.

An expanding universe does not necessarily support the big-bang theory. Just because the universe is apparently expanding does not mean that it was ever infinitely small; nor does this indicate that a big bang caused the expansion. The big bang is a theory which intends to explain universal expansion within the framework of naturalism. It is interesting that the Bible recorded the notion of an expanding universe thousands of years before secular science came to accept the idea.

## Chapter 2, Worksheet 2

**Ptolemy** — Greek astronomer and geographer of the 2nd century, A.D.

**gravity** — the natural force which causes objects to fall toward the earth

1. mass
2. mass, energy
3. 10,000
4. ordinances
5. secular science
1. The principle of conservation of energy states that energy cannot be created nor destroyed. There are many kinds of energy: heat, light, sound, electricity, etc. . . . We can change one type of energy into another and we can move energy from one place to another, but the total quantity of energy in the universe is constant and cannot be changed.

## Chapter 3, Worksheet 1

**circular reasoning** — the logical fallacy in which a premise presupposes the conclusion in some way, yet provides no reason at all to believe its conclusion