

TEACHER GUIDE

7th–8th Grade

Includes Student
Worksheets

Science



Weekly Lesson Schedule



Student Worksheets

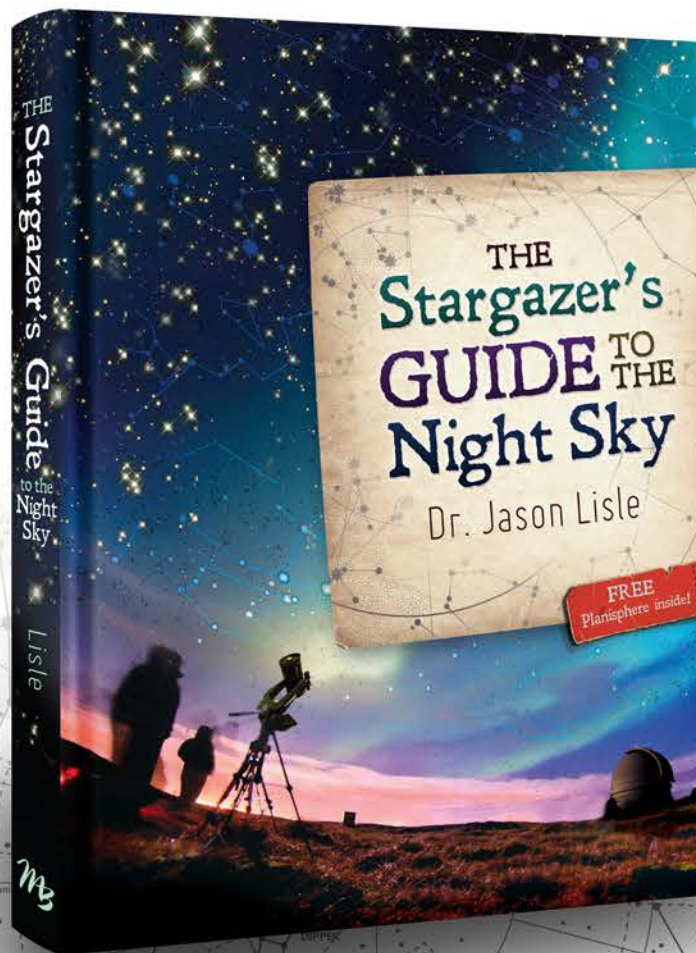


Quizzes



Answer Key

INTRO TO ASTRONOMY







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Introduction to Astronomy



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Author Bio:

Dr. Jason Lisle is the director of research and a featured speaker and writer for the Institute for Creation Research. He previously served as the planetarium director for the Creation Museum in Kentucky. He holds bachelor of science degrees in physics and astronomy, and a master's and PhD in astro-physics. As a creation scientist, Dr. Lisle effectively communicates a broad range of topics from in-depth presentations of distant starlight, Einstein's relativity, and problems with the big bang, to topics from astronomy and general science to apologetics and dinosaurs. Dr. Lisle has authored a number of other books, including *The Ultimate Proof of Creation*, *Old-Earth Creationism on Trial*, and *Taking Back Astronomy*.

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, two to three days a week
	Includes answer keys for worksheets and quizzes
	Worksheets for each chapter
	Quizzes are included to help reinforce learning and provide assessment opportunities
	Designed for grades 7 to 8 in a one-year course
	Suggested labs (if applicable)

Course Objectives: Students completing this course will

- ✓ Evaluate how the phases of the moon work
- ✓ Discover how to choose the best telescope for you
- ✓ Investigate the motions of the sky, star classification, and deep sky objects
- ✓ Identify what sort of objects can be seen with binoculars
- ✓ Learn the best ways and optimal times to observe planets and stars

Course Description

Explore the night sky, identify stars, constellations, and even planets. Learn how to stargaze with a telescope, binoculars, or even your naked eye. Allow Dr. Jason Lisle, a research scientist with a masters and PhD in astrophysics, to guide you in examining the beauty of God's Creation. Find Orion, a well-known constellation, and within it you can easily see the red super giant star Betelgeuse over 3000 trillion miles away without binoculars or a telescope! At 60,000 times the diameter of Earth, it is a celestial sight! Or marvel at our galaxy, the Milky Way, shining brightly overhead in late summer as you see the dark patches of dust as well as light spots containing entire star clusters! Includes 150 beautiful, full-color star-charts and other easy to use illustrations for success. When will the next solar eclipse take place? What is that bright star setting in the west? How do I find Saturn? Take a few moments to stand and look up at the glorious night sky, appreciating the majestic beauty of God's vast universe. Includes the Stargazer's Planisphere, a chart that helps you locate the positions of stars on any night of the year so you can better enjoy God's amazing night sky.

Suggested Optional Science Lab

Parents may assign this as a Science or Elective credit. The description "with Lab" may be added to course title if student completes about 15 hours of lab work.

Optional Lab Equipment A good telescope is highly recommended. (Materials Available from www.HomeTrainingTools.com)

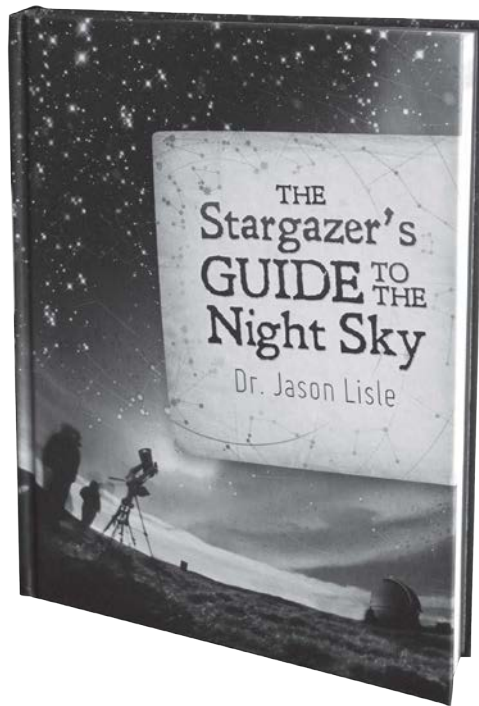
AS-ASTRLAB Astrolabe Kit

AS-STARLOC Star and Planet Locator

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				
	Day 3	Intoduction - Short Answers Stargazer Introduction: Worksheet 1 • Pages 15-16 Teacher Guide • (TG)			
	Day 4				
	Day 5	Read Pages 6-10 • ()			
Week 2	Day 6				
	Day 7	Motions in the Sky — Basic - Short Answers Stargazer Ch1: Worksheet 1 • Pages 17-18 • (TG)			
	Day 8				
	Day 9	Read Pages 11-15 • (SGNS)			
	Day 10				
Week 3	Day 11	Motions in the Sky — Basic - Short Answers Stargazer Ch1: Worksheet 2 • Pages 19-20 • (TG)			
	Day 12				
	Day 13	Read Pages 16-20 • (SGNS)			
	Day 14				
	Day 15	Motions in the Sky — Basic - Short Answers Stargazer Ch1 • Worksheet 3 • Pages 21-22 • (TG)			
Week 4	Day 16				
	Day 17	Read Pages 21-23 • (SGNS)			
	Day 18				
	Day 19	Motions in the Sky — Basic - Short Answers Stargazer Ch1 • Worksheet 4 • Pages 23-24 • (TG)			
	Day 20				
Week 5	Day 21	Read Pages 24-27 • (SGNS)			
	Day 22				
	Day 23	Motions in the Sky — Advanced - Short Answers Stargazer Ch2: Worksheet 1 • Pages 25-26 • (TG)			
	Day 24				
	Day 25	Read Pages 28-33 • (SGNS)			
Week 6	Day 26				
	Day 27	Motions in the Sky — Advanced - Short Answers Stargazer Ch2: Worksheet 2 • Pages 27-28 • (TG)			
	Day 28				
	Day 29	Read Pages 34-37 • (SGNS)			
	Day 30				

Date	Day	Assignment	Due Date	✓	Grade
Week 7	Day 31	Motions in the Sky — Advanced - Short Answers Stargazer Ch2: Worksheet 3 • Page 29 • (TG)			
	Day 32				
	Day 33	Read Pages 38-41 • (SGNS)			
	Day 34				
	Day 35	Motions in the Sky — Advanced - Short Answers Stargazer Ch2: Worksheet 4 • Page 31 • (TG)			
Week 8	Day 36				
	Day 37	The Stargazer's Guide to the Night Sky: Chapters 1-2 Quiz Pages 101-104 • (TG)			
	Day 38				
	Day 39	Read Pages 42-47 • (SGNS)			
	Day 40				
Week 9	Day 41	Understanding the Eye - Short Answers Stargazer Ch3: Worksheet 1 • Page 33 • (TG)			
	Day 42				
	Day 43	Read Pages 48-53 • (SGNS)			
	Day 44				
	Day 45	Astronomy with the Unaided Eye - Short Answers Stargazer Ch4: Worksheet 1 • Page 35 • (TG)			
First Semester–Second Quarter					
Week 1	Day 46	Read Pages 54-61 • (SGNS)			
	Day 47				
	Day 48	Astronomy with the Unaided Eye - Short Answers Stargazer Ch4: Worksheet 2 • Page 37 • (TG)			
	Day 49				
	Day 50	Read Pages 62-69 • (SGNS)			
Week 2	Day 51				
	Day 52	Astronomy with the Unaided Eye - Short Answers Stargazer Ch4: Worksheet 3 • Page 39 • (TG)			
	Day 53				
	Day 54	The Stargazer's Guide to the Night Sky: Chapters 3-4 Quiz Pages 105-106 • (TG)			
	Day 55				
Week 3	Day 56				
	Day 57	Read Pages 70-74 • (SGNS)			
	Day 58				
	Day 59	Celestial Events - Short Answers Stargazer Ch5: Worksheet 1 • Page 41 • (TG)			
	Day 60				



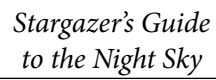
Astronomy Worksheets
for Use with
The Stargazer's Guide to the Night Sky



1. What are you expecting and hoping to learn from this course?
2. What are three different ways you can observe the night sky?
3. Is there a difference in the sky depending on whether you live in the Southern or Northern Hemisphere?

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

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



1. Why is there a trend of east-to-west motion when observing the sun, moon, and stars?

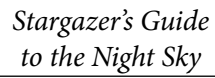
2. What is this trend of the earth's rotation called?
3. What is the approximate rotation time of the earth that relates to other objects in the sky as well?

4. Name the concept that is useful for understanding the positions and motions of stars.
5. Name the concept that involves expanding the earth's equator into space.
6. What are constellations called that are close enough to the celestial pole that they are visible all night, year-round?
7. Since the 23 hours and 56 minutes period is the length of time it takes the earth to turn as seen from a distant star, this is called a "_____."

Short Answers

1. Describe the difference between the sidereal day and the solar day.
2. Since stars rise two hours earlier every month, they rise ____ hours earlier after six months.
3. Why is it difficult to observe planets, globular clusters, and nebulae when the moon is full?
4. The moon rises (on average) about _____ later each day.

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.



1. The motion of the planets is complicated because their apparent motion in the sky is the combination of their _____ around the sun, plus the _____ in position due to Earth's motion around the sun.
2. What is responsible for the seasons on Earth?
3. Describe what the two coordinate systems widely used in astronomy are based on.
4. _____ describes how high above the horizon an object is (in angle).

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 _____.



Short Answers

1. Stars with a declination that is less than your latitude will pass _____ of zenith when they cross the meridian; and stars with a greater declination will pass _____ of zenith.

2. Which RA coordinates can be seen depends on the time of ____ and the time of ____.

3. Once calibrated on an object whose RA and Dec you know, you can use _____ circles on a telescope to find any other RA or Dec.

4. What is the best way to get a feel for the motions in the sky?

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 _____.

Answer Keys

***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 sun 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