

TEACHER GUIDE

7th–12th Grade

Includes Student
Worksheets

Science



Answer Keys



Weekly Lesson Schedule



Worksheets



Quizzes & Tests

GENERAL SCIENCE 1: SURVEY OF EARTH AND SKY







TEACHER GUIDE

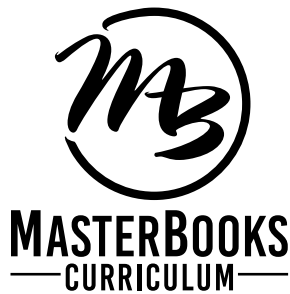
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General Science 1



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About Our Creationist Authors

The New Weather Book: **Michael Oard** earned his master's degree in atmospheric science in 1973 from the University of Washington. He was a meteorologist with the National Weather Service beginning in 1973 and lead forecaster in Great Falls, Montana from 1981 to 2001. He has written numerous books related to the Ice Age, geology, and the Great Flood.

The New Astronomy Book: **Dr. Danny R. Faulkner** has a BS in math, MS in physics, MA and PhD in astronomy from Indiana University. He previously taught physics and astronomy at the University of South Carolina — Lancaster, and is now on staff at Answers in Genesis and the Creation Museum.

The Mineral Book: **David R. McQueen** was trained in mineralogy at the University of Tennessee (BA in geology) and at the University of Michigan (MS in geology). McQueen taught college geology at George Mason University, Virginia State University, East Tennessee State University, and the Institute for Creation Research's Graduate School.

The New Ocean Book: **Frank Sherwin** received his bachelor's degree in biology from Western State College and later obtained a master's degree in zoology. He is currently a Research Associate, Senior Lecturer, and Science Writer for the Institute for Creation Research.

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, quizzes, and tests



Worksheets for each section



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



Designed for grades 7 to 12 in a one-year course to earn 1 science credit

Course Description

This is the suggested course sequence that allows one core area of science to be studied per quarter. You can change the sequence of the quarters per the needs or interests of your student; materials for each quarter are independent of one another to allow flexibility. In the quarter on meteorology, students will learn about God’s design of this complex world and its weather patterns that affect our lives every day. The quarter on astronomy extends God’s design to the universe itself, and how all creation declares the glory and power of God. The universe is beautiful and breathtaking in its scale, and the earth and vast expanse of the universe is a struggle to study, understand, or even comprehend in terms of its purpose and size. The quarter on minerals shows how minerals are a gift of God’s grace, from the diamond in an engagement ring to copper chains to components of video games. And the quarter on the oceans teaches about the oceans and the abundance and diversity of life, the wealth of resources, the latest discoveries, and the simple mysteries that have intrigued explorers and scientists for centuries. A better understanding of the world ensures careful stewardship of its grandeur and beauty for future generations, and leads to a deeper respect for the delicate balance of life that God created on planet Earth.

Course Objectives

Students completing this course will:

- ✓ Investigate how clouds form and how to identify the different types
- ✓ Review how to read a weather map, and what our responsibility is to the environment
- ✓ Learn how to survive in dangerous weather
- ✓ Identify what we know and are still trying to discover about planets, moons, and comets within our own solar system
- ✓ Evaluate up-to-date astronomical data and concepts
- ✓ Explore the dynamics of planets, stars, galaxies, and models for the cosmology of the universe
- ✓ Discover the best ways to observe the heavens
- ✓ Demonstrate a deeper understanding of the ocean tides, waves, and currents
- ✓ Explore the vast world of giant squids and other sea “monsters”
- ✓ Discover the impact of weather systems and the Great Flood on Earth’s land and seas
- ✓ Learn about the order and beauty of minerals shaped by the Creator
- ✓ Find out the properties of minerals, where they can be found, and how they are used, along with fun facts.

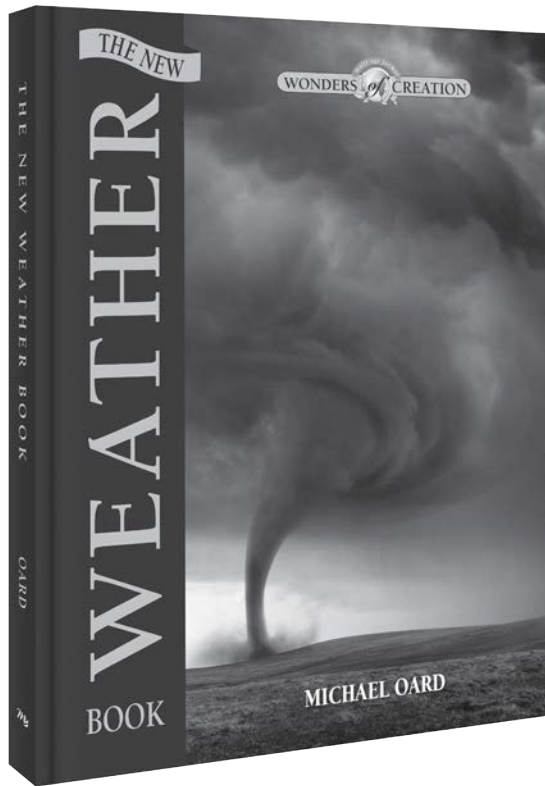
Optional Science Labs: Please see MasterBooks.com for recommended science labs and kits. These are not a part of the schedule, so they can be completed however you decide.

Note on Activities: High school students who take the course are expected to do a majority of the activities. The activities can be modified based on student interests and creativity, but should reflect an understanding of the core concepts being learned. Since specific activities are not mentioned on the schedule, you may decide which activities the students need to complete.

First Semester Suggested Daily Schedule

Date	Day	Assignment	Due Date	✓	Grade
First Semester-First Quarter — <i>The New Weather Book</i>					
Week 1	Day 1	Read Pages 4–7 • <i>The New Weather Book</i> • (NWB)			
	Day 2	God Created Weather Chapter 1: Worksheet 1 Page 17 • Teacher Guide (TG)			
	Day 3	Read Pages 8–11 • (NWB)			
	Day 4	Read Pages 12–19 • (NWB)			
	Day 5	What Causes Earth's Weather? Weather Chapter 2: Worksheet 1 • Pages 19–20 • (TG)			
Week 2	Day 6	What Causes Earth's Weather? Weather Chapter 2: Worksheet 2 • Pages 21–22 • (TG)			
	Day 7	Read Pages 20–27 • (NWB)			
	Day 8	Read Pages 28–31 • (NWB)			
	Day 9	Water in the Atmosphere Weather Chapter 3: Worksheet 1 • Pages 23–24 • (TG)			
	Day 10	Water in the Atmosphere Weather Chapter 3: Worksheet 2 • Pages 25–26 • (TG)			
Week 3	Day 11	Weather Chapter 1–3: Quiz 1 • Pages 153–154 • (TG)			
	Day 12	Read Pages 32–36 • (NWB)			
	Day 13	Read Pages 37–39 • (NWB)			
	Day 14	Thunderstorms Weather Chapter 4: Worksheet 1 • Pages 27–28 • (TG)			
	Day 15	Thunderstorms Weather Chapter 4: Worksheet 2 • Page 29 • (TG)			
Week 4	Day 16	Read Pages 40–44 • (NWB)			
	Day 17	Read Pages 45–51 • (NWB)			
	Day 18	Dangerous Thunderstorms Weather Chapter 5: Worksheet 1 • Pages 31–32 • (TG)			
	Day 19	Dangerous Thunderstorms Weather Chapter 5: Worksheet 2 • Pages 33–34 • (TG)			
	Day 20	Dangerous Thunderstorms Weather Chapter 5: Worksheet 3 • Pages 35–36 • (TG)			
Week 5	Day 21	Read Pages 52–54 • (NWB)			
	Day 22	Read Pages 55–59 • (NWB)			
	Day 23	Hurricanes Weather Chapter 6: Worksheet 1 • Pages 37–38 • (TG)			
	Day 24	Hurricanes Weather Chapter 6: Worksheet 2 • Pages 39–40 • (TG)			
	Day 25	Weather Chapter 4–6: Quiz 2 • Pages 155–156 • (TG)			

Date	Day	Assignment	Due Date	✓	Grade
Week 6	Day 26	Read Pages 60–67 • (NWB)			
	Day 27	Winter Storms Weather Chapter 7: Worksheet 1 • Pages 41–42 • (TG)			
	Day 28	Winter Storms Weather Chapter 7: Worksheet 2 • Pages 43–44 • (TG)			
	Day 29	Winter Storms Weather Chapter 7: Worksheet 3 • Page 45 • (TG)			
	Day 30	Read Pages 68–73 • (NWB)			
Week 7	Day 31	Wild Weather Weather Chapter 8: Worksheet 1 • Pages 47–48 • (TG)			
	Day 32	Wild Weather Weather Chapter 8: Worksheet 2 • Pages 49–50 • (TG)			
	Day 33	Read Pages 74–81 • (NWB)			
	Day 34	Climate in the Past Weather Chapter 9: Worksheet 1 • Page 51 • (TG)			
	Day 35	Climate in the Past Weather Chapter 9: Worksheet 2 • Pages 53–54 • (TG)			
Week 8	Day 36	Climate in the Past Weather Chapter 9: Worksheet 3 • Page 55 • (TG)			
	Day 37	Weather Chapter 7–9: Quiz 3 • Pages 157–158 • (TG)			
	Day 38	Read Pages 82–91 • (NWB)			
	Day 39	Climate Change Weather Chapter 10: Worksheet 1 • Page 57 • (TG)			
	Day 40	Climate Change Weather Chapter 10: Worksheet 2 • Page 59 • (TG)			
Week 9	Day 41	Climate Change Weather Chapter 10: Worksheet 3 • Pages 61–62 • (TG)			
	Day 42	Read Pages 92–94 • (NWB) God, Creation and You Weather Chapter 11: Worksheet 1 • Page 63 • (TG)			
	Day 43	God, Creation and You Weather Chapter 11: Worksheet 2 • Page 65 • (TG)			
	Day 44	Weather Chapter 10–11: Quiz 4 • Pages 159–160 • (TG)			
	Day 45	The New Weather Book Test • Pages 161–164 • (TG)			
First Semester-Second Quarter — <i>The New Astronomy Book</i>					
Week 1	Day 46	Read Pages 6–7 • <i>The New Astronomy Book</i> • (NAB) Astronomy Intro: Worksheet 1 • Pages 69–70 • (TG)			
	Day 47	Read Pages 8–11 • (NAB) • The Night Sky - Words on Astronomy Chapter 1: Worksheet 1 • Page 71 • (TG)			
	Day 48	The Night Sky - Questions/Activity on Astronomy Chapter 1: Worksheet 1 • Page 72 • (TG)			
	Day 49	Read Pages 12–16 • (NAB)			
	Day 50	The Moon - Words/Questions on Astronomy Chapter 2: Worksheet 1 • Page 73 • (TG)			



Meteorology Worksheets

for Use with

The New Weather Book



Words to Know (Definitions can be found in the Glossary in the back of this Teacher Guide.)

atmosphere

axis

carbon dioxide

climate

latitudes

nitrogen

oxygen

tide

Short Answer

1. How did Adam and Eve's first sin affect the weather?

2. Why can humans predict the weather?

3. Explain how weather affects your life.

4. Explain the anthropic principle in relation to the following terms:
 - a. Tides:

 - b. Seasons:

 - c. Temperature:

 - d. Atmosphere:



Words to Know

arid

barometer

condensation

dew point

Doppler radar

Short Answer, Fill in the Blank, and True or False

1. _____ is the momentary condition of the air.
2. Weather is composed of seven components. What are they?
 - a.
 - b.
 - c.
 - d.
 - e.
 - f.
 - g.
3. Why is the sun called the weather engine?
4. _____ act like a blanket to keep the earth warmer at night.
5. What causes the earth's winds?
6. Describe what causes the Coriolis Force.

7. True or False: The Coriolis force moves in a clockwise rotation.
8. What causes the jet stream?

Activity

Sketch a picture of the globe and jet streams on page 11 of *The New Weather Book*. Be sure to label the jet streams and the equator.



Words to Know

equator

low-pressure system

ice cap

meteorologist

precipitation

weather balloon

Short Answer and Fill in the Blank

1. Where are storms usually found?
2. Give the memory tip to tell the difference between a cold and warm front.
3. Give two types of weather observations and how they are taken.
 - a.
 - b.
4. Draw and label the four types of weather fronts.
 - a.
 - b.
 - c.
 - d.
5. Why are weather forecasts sometimes incorrect?

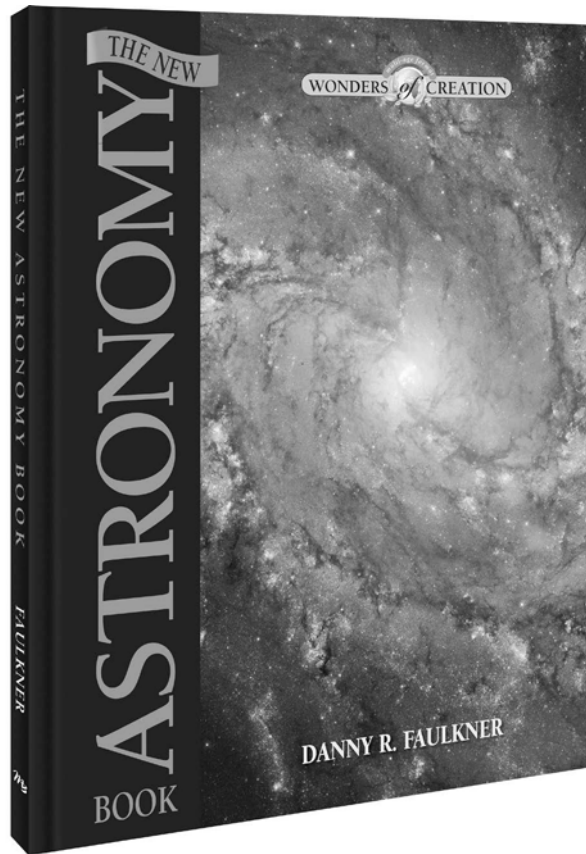
6. Explain how general circulation causes climate.

7. What is the general circulation?

8. The earth has a total of _____ average circulations.

Activities (Note: Always ask a parent or teacher before using the Internet for research.) _____

1. Write a report on your weather. Describe the climate and features of the area that you live in and what affects your weather. (You may want to contact a local station and ask if you can interview a weather person.)
2. Write a report on the history of meteorology.
3. Write a report on NOAA. Describe what NOAA does, including the various components.
4. Produce a weather show detailing weather extremes and strange facts. (You may use information found on pages 18–19 of *The New Weather Book*, but be sure to find some of your own.) Make it fun. Gather your friends and family to listen to your television show! Hint: Write notes on note cards as reminders of facts you want to give.



Astronomy Worksheets
for Use with
The New Astronomy Book

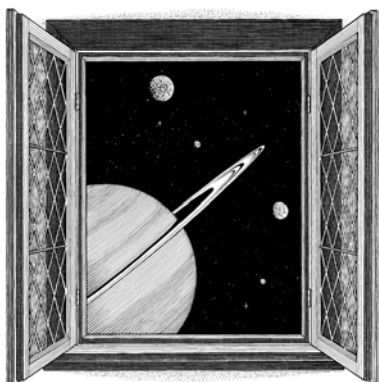
Special Course Activity Options

(NOTE: These can be done in combination with or rather than activities on each worksheet as noted on the daily schedule.) All project options will have the opportunity to score 100 points for their selected project. NASA, creation ministries, and libraries can be important sources of information for the projects of choice. Please be aware when searching other space-related sites that most do not include a biblical worldview.

Project notebook: This is a way to record results from the various suggested activities on *The New Astronomy Book* worksheets. NOTE: Grading should be based on the quality of research, coherence of presentation, good essay structure, and attribution of sources used.

Creative or Conceptual Projects: Artistic or engineering-focused; these are projects that include drawing or conceptualizing based on limited information. Could include various forms, for example:

- Drawing a series of images of imaginative colonies and facilities on the moon or Mars, ship designs that consider use of alternative renewable energy sources as fuel, exploration of potential commercial aspects of space-related activities.
- Student may choose to incorporate space-themed selections as part of a separate art course, or choose to imagine and draw structures, buildings, or dwellings related to space travel or colonization. (For example: imagine and draw a space library with no printed books, or greenhouses on Mars.)
- Younger students may want to fashion a children's story that they write and illustrate related to travel and study on another planet. Or they may do simple drawings.



Historical

- History of man's race to space
- The story of NASA's formation and operations
- A landmark space-related achievement
- Development of telescopes or other technology aiding in man's study of stars

Cultural

- Which countries have achieved reaching space and why? Why have some not?
- What areas of possible dispute arise in terms of the space race (i.e., military functions, claiming of resources, potential monopolies by one or a small number of countries)?

Scientific

- Write an 8- to 10-page biography of a scientist, astronomer, or astronaut mentioned in the book
- Discuss any theory noted in the book or related to space exploration or understanding the universe

Futuristic

- Imagine how a space-based governing body would function when the focus is no longer on individual countries or planets.
- What are the biggest challenges of manned exploration in distant space, and what solutions can you imagine to solve them?
- What viable reasons can you discuss that would justify spending vast amounts of money to colonize other areas of space or seek possible life in other places in space despite having no evidence that it exists, especially with the challenges already facing mankind on earth?



Words to Know

astronomical

comet

astrophysics

astronomy

spectroscopy

Short Answer

1. According to verses 14–15, what were the three purposes of stars?
2. What were the two great lights — the one that governs the day and the one that governs the night?
3. Verses 17–18 echo which of the other verses in the passage?
4. In verse 18, how does God describe this part of creation?
5. On what day of the creation week did these events occur?

Activity

Take a look at the night sky!

Go out this evening just after dark. Mark your position on this drawing in relation to your house or a tree, and then draw in the moon and the constellations you recognize. Wait a few moments for your eyes to get used to the dark, and then note three other things that catch your attention in the night sky.

Hint! You can go to the following link: <http://nightsky.jpl.nasa.gov/planner.cfm>. You will find some helpful information and other links — including information on how clear it will be for night viewing and even a link for a site that allows you to download monthly evening sky maps for free. There are also free apps that help you identify what you see in the night sky.

You can also use the charts on pages 90 and 91 to help identify constellations.





Words to Know

constellations

axis

celestial

circumpolar

revolution

pagan

retrograde motion

Short Answer

1. Describe how stars move in the north near the North Pole.
2. How do circumpolar stars move in the Southern Hemisphere, and does the South Pole have a main star like Polaris is in the north?
3. Is Orion a winter or summer constellation in the Northern Hemisphere? Which would it be in the Southern Hemisphere?
4. What is a NEO? Can you give a recent example of a NEO that was mentioned on the news?
5. Is the study of the constellations a result of discoveries by modern science and space probes?
6. Which has the faster orbit cycle, the moon or the sun?

7. How long is the rotation of the sun? How long is the rotation of the moon?

8. Is rotation or revolution the circular motion around an axis that passes through the center of a body, such as a planet or moon?

9. List the five planets that appear as bright as stars in the sky.
 - a.

 - b.

 - c.

 - d.

 - e.

10. The light of which two planets is too faint to be seen with the naked eye, and was not discovered until the invention of telescopes?

Activity

Try to create a model out of things readily available in your home that will allow you to demonstrate retrograde motion. Remember, you can be as creative as you want to be, but it doesn't have to be a costly activity. For example, it could be done with balls, marbles, or even small rocks. Use chalk on a piece of cardboard to trace the path of objects and demonstrate retrograde motion.



Words to Know

unmanned

maria

highlands

lunar

impact basins

asteroids

bombardment

Short Answer

1. Compared to earth, how large is the moon?
2. What is the radius of the moon's orbit in miles?
3. Name one of three NASA space programs that focused on developing manned spaceflight.
4. What landmark of human achievements in space occurred on July 20, 1969?
5. What is synchronous orbit? Does the earth or the moon exhibit this orbit?
6. Who was the first person to see craters on the moon?
7. What two theories were debated in trying to explain the craters on the moon?

8. Why are some areas of the moon's surface darker than others?

9. How do evolutionists use EHB and LHB to explain the moon?

10. How does the moon produce light?

Activity

Find a calendar that marks the phases of the moon. Highlight the following moon phases on this calendar, marking up six different months:

First Quarter

Gibbous

Waxing Gibbous

Full Moon

Waning Gibbous

Third Quarter

New Moon

Discover if the phases always land on the same days of the month. Is there a set number of days between the same phases in consecutive months? Is there a set number of days between each of the various phases within a given month?



Fill in the Blank

Fill in the missing word in the paragraph below using the words from this list:

sun high full lunar spring tide
difference neap tide quarter small

The _____ also produces tides, but because it is so much farther away than the moon, its tides aren't nearly as high. At new and _____ moon, both _____ and solar tides work together, and we say that this is _____. This name refers to how much the tides leap from very low levels at low tide to very high levels at high tide. On the other hand, at the _____ phases, the lunar and solar tides compete. This is a _____, and low tide is large, but the _____ between high and low tide is _____ at neap tide.

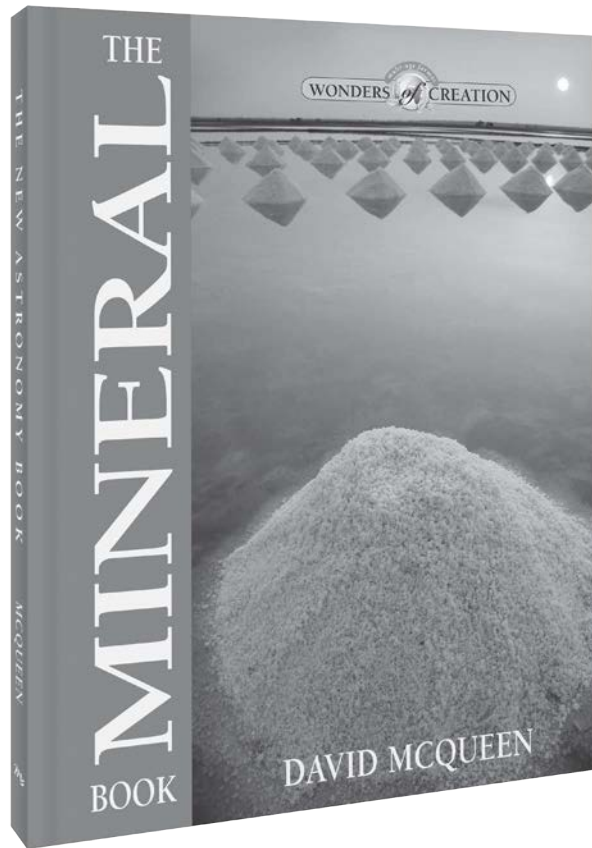
Short Answer

1. How does gravity from both the moon and the earth impact one another?
2. Is the moon's gravity pull on earth evenly distributed?
3. What is a lunar eclipse?
4. What is the only time a lunar eclipse can occur, and why?
5. What is the other name for the earth's shadow?
6. What clues helped lead ancient astronomers to realize that the earth was round?

7. Did the early church or Christians really teach that the world was flat?
8. During total solar eclipses, what are the corona and the prominences?
9. Why do the sun and the moon appear to be the same size during a solar eclipse?
10. What is the shape of the moon's orbit?

Activities

1. In a short, one-page essay, explain how the sun and the moon and stars help to mark the passage of time.
2. Go to the library and see if you can find a book about astronauts Neil Armstrong, Buzz Aldrin, or Michael Collins. See if you can discover the training they had to undergo in order to become astronauts. Imagine space travel today with all of the amazing technological advances. What kinds of skills do you think you would need in order to become an astronaut today? Write down five possible skills you feel would be needed. Visit www.nasa.gov and search for astronaut training to see if any of your guesses are part of the program!



Mineralogy Worksheets

for Use with

The Mineral Book



Words to Know

rare minerals

chemical interactions

native mineral

evaporation

deep-shaft mining

solution mining

Short Answer

1. How many minerals are there estimated to be in the world?
2. What was salt used for in 2 Chronicles?
3. Where is the largest salt mine in the United States? The world?
4. Why does solution mining (or salt panning) take a toll on the health of the workers?
5. Name the seven minerals we benefit from in a typical morning.

Activities

 (Note: Always ask a parent for permission to use the internet for research.)

1. Write a report on the how the “Scarlet Thread” winds it way through Scripture. With a parent’s permission, research the work done by Dr. W. A. Criswell. Use both your research and the Bible to write your report.
2. Make a list of minerals that remind you of teachings in the Bible. You may start with the the three given on page 9.
3. Test yourself on “The Mysteries of Life” on page 5. Have a parent or friend ask you the questions and give them an answer.

**Short Answer**

1. How do we get the minerals our bodies need?
2. Write out Romans 1:20 and memorize it.
3. Write out Hebrew 11:6 and memorize it.
4. What are the three types of rocks, and when were they formed?
5. Name the three types of breaker boys and what their job was.
6. What kinds of expenses go into operating a mineral mine?
7. What kind of rock did Michelangelo use to sculpt his figure of Moses?
8. What kinds of minerals have been used to create lasting color in paints for artwork?

Activities (Note: Always ask a parent for permission to use the internet for research.)

1. Create a chart that show the minerals our body needs listed on page 14. Include the kinds of food that contain the minerals we need. Record what you eat for a week. Check off each kind of food that that you eat that contains the minerals your body needs.
2. Write a report on what can happen when we are missing a needed mineral in our diet.
3. Write a report on rare minerals.
4. Write a report on the working conditions of breaker boys.
5. Write a report on the types of equipment and vehicles modern mining operations use.
6. Compare the definitions of minerals from three mineral or geology books in your library or from online sources. If you can, obtain a copy of *The Geology Book* and read chapter 8. Note the differences between secular sources and Christian sources.



Words to Know

geodes

Johannes Gutenberg (1395 — 1468)

cuprous

cupric

compounds

inorganic

valence

Short Answer

1. What does Exodus 28:15 say Amethyst was used for?
2. Explain how geodes are formed.
3. How can we be more extraordinary than a geode?
4. What does it mean to subdue the earth according to God's command, and how does it apply to minerals?
5. What gift was given to the United States by France that is completely covered in copper?

Activities

(Note: Always ask a parent for permission to use the internet for research.)

1. Look in your house for pennies older than 1983. After 1982, pennies have actually been copper-plated zinc coins, which are cheaper to produce. How many did you find?
2. Write a report on the many uses of copper. Describe the attributes of copper that make it so useful.



Short Answer and Fill in the Blank

1. What metal did Johannes Gutenberg use to construct a printing press?
2. Name the five foundations the book has given to define a mineral.
3. What terms should we be aware of and why?
4. What are the six basic types of crystal structure?
5. List 5 things that indicate something is not a mineral.
6. _____ make up a rock just as _____ make up a brick wall, in a great variety of _____.
7. What mineral is the metal tungsten refined from?
8. Write out Philippians 4:19 and memorize it.

Activities

(Note: Always ask a parent for permission to use the internet for research.)

1. Do a word search on copper in the Bible. How many times is it used? Is copper (or brass or bronze) mentioned more in the Old Testament than the New? What is the Greek word for copper? The Hebrew? Try using various versions to see if copper is used more often by certain translators.
2. Write a report on the many uses of tungsten. Describe the attributes of tungsten that make it so useful.



Create a Mineral Notebook!

Create a Mineral Notebook!

- ✓ You will need a 3-ring binder.
- ✓ Make at least 10 copies of the next page. Make as many as you will need to study the minerals you are interested in. 3-hole punch them and put them into your binder.
- ✓ You may also want to use divider pages with tabs to make it easier to find certain minerals.
- ✓ Go to page 21. Complete your first mineral page using the information given here on the amethyst. Write the name on the page. Draw or print out a picture of the mineral, then fill out the mineral identification information. Write about the mineral, and include a fun fact. Find and copy a Bible verse about the mineral.
- ✓ Continue to fill out a new mineral page each time you come to a new one in the book.
- ✓ Fill out a new mineral page for any mineral you are interested in studying.

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Large blank box with rounded corners for drawing or notes.

Horizontal lines for writing notes.

MINERAL FOCUS

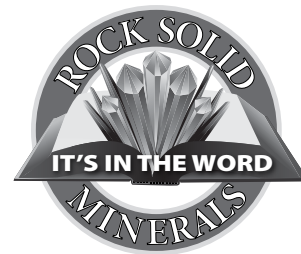
CHEMICAL FORMULA

CRYSTAL SYSTEM

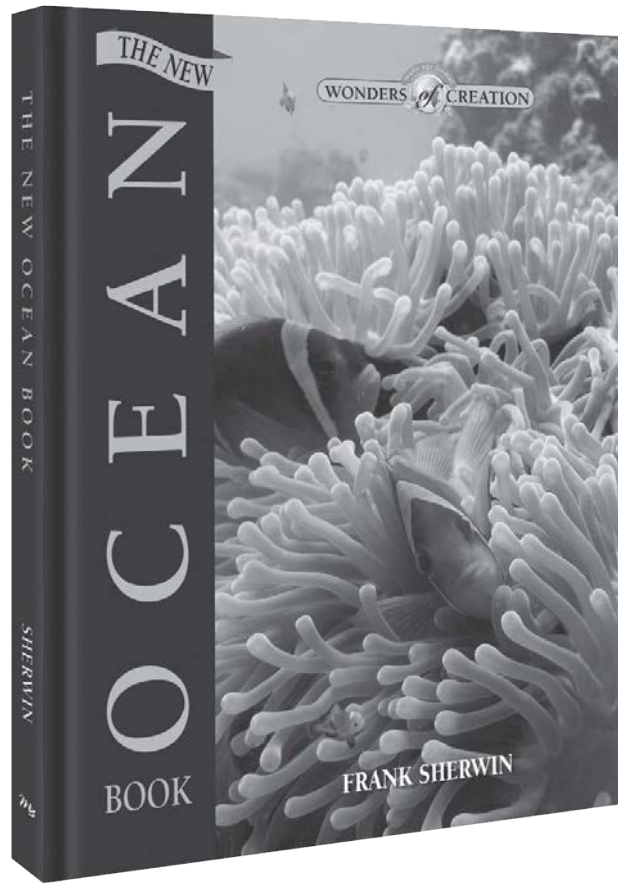
HARDNESS

LUSTER

STREAK



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Oceanography Worksheets

for Use with

The New Ocean Book



Words to Know

photosynthetic organisms

Ring of Fire

Short Answer

1. What is Earth's nickname?
2. Describe the size of the Earth's oceans.
3. What do oceans help regulate?
4. Name the two things that each provide half our atmosphere's oxygen.
5. Write out Nehemiah 9:6 and commit it to memory.
6. How much of the American population live within fifty miles of the coast of an ocean?
7. Name the five distinct oceans that scientists recognize in order of size.

Activities

(Note: Always ask a parent for permission to use the internet for research.)

1. Write a report on the how the ocean gets its varieties of color.
2. Write a report on the effects the ocean has on our weather.
3. Write a report on what we know about the bottom of the ocean.
4. Draw a map as shown on page 9. Research the trade routes and draw them on the map. Continue to add new information you learn in this course to your map.



Words to Know

oceanography

meteorology

Short Answer and Fill in the Blank

1. Name diverse fields studied as part of oceanography, or marine science.
2. What disciplines should a good oceanographer be knowledgeable in?
3. What ship set out for England to conduct the first expedition devoted to oceanographic research? When did it set off? How long was the expedition to last?
4. What belief held by Professor Edward Forbes was proven wrong by the HMS *Challenger* scientists?
5. There has been more exploration of the ocean bottom since _____ than in all the rest of recorded history.
6. What does the book of Genesis say about water?

Activities

(Note: Always ask a parent for permission to use the internet for research.)

1. Research the various fields in oceanography. Write a report on one of them. Include a job description and how it benefits mankind. Discuss what people are learning about the ocean through the study of the field you have chosen.
2. Write a report on the expedition of the HMS *Challenger*. Discuss some of the discoveries made on this voyage.
3. Write a report on the Mindanao Trench. Include the information we have learned about this area through technology.



Short Answer and Fill in the Blank

1. What did the Deep Sea Drilling Project do?
2. How and where are the core sample stored?
3. What was the main emphasis of oceanography in the mid-90s?
4. What have scientists used to determined where to penetrate the sea floor with drill holes tens-of-thousands of feet deep?
5. In 2012 the deepest drilling to date was conducted by R/V Chikyu, a vessel of the International Ocean Drilling Program. The borehole went to an amazing depth of _____ feet.

Multiple Choice

Match the areas of study to each branch of oceanography.

- | | |
|--------------------------|--------------------------------|
| a. Marine Biology | b. Marine Geology & Geophysics |
| c. Physical Oceanography | d. Chemical Oceanography |
6. _____ the study of the chemical composition of seawater and material in suspension, the nature of dissolved gases and solids, chemical cycles like the carbon cycle, the acidity of seawater in relationship to the ocean bottom and the atmosphere
 7. _____ the application of the scientific method to the ocean's animal and plant life
 8. _____ the study of the physical features of the ocean's water, such as temperature, density, waves, currents, tides, sea ice, air-sea interaction, the ability to transmit sound and light
 9. _____ the study of the nature and physics of the ocean's solid structure, including all aspects of the continental slopes and shelves and the ocean basins

Activities

(Note: Always ask a parent for permission to use the internet for research.)

1. Write a report on why and how we should care for our oceans. Include Scriptural reasons why we should care about our oceans. Include specific things we can do to keep oceans healthy and why it matters.
2. Write a report on one of the areas of oceanographic research disciplines (on page 13) and how it helps us to understand God's creation.

Quizzes & Tests Section



Define: (5 Points Each Answer)

1. climate: _____

2. nitrogen: _____

3. oxygen: _____

4. precipitation: _____

5. cirrus clouds: _____

6. cold front: _____

7. evaporation: _____

8. stratus clouds: _____

9. warm front: _____

10. water vapor: _____

Short Answer: (5 Points Each Question)

1. How did Adam and Eve's first sin affect the weather?
2. Why can humans predict the weather?
3. Why is the sun called the weather engine?

4. Draw and label the four types of weather fronts.
5. Why are weather forecasts sometimes incorrect?
6. Explain how general circulation causes climate.
7. Describe the water cycle.
8. Which two cloud classifications are made of only water drops?
9. Describe the differences between warm fronts and cold fronts.
10. What is the most common way for fog to form?

Answer Keys

The Weather Book — Worksheet Answer Keys

God Created Chapter 1 Worksheet 1

atmosphere — the body of gasses that surround the earth.

axis — an imaginary straight line through the center of the earth on which it rotates

carbon dioxide — a colorless, odorless gas formed during respiration, combustion, and organic decomposition

climate — the weather conditions that are particular to a certain area, such as wind, precipitation, and temperature.

latitudes — the distance north or south of the equator measured with imaginary lines on a map or globe

nitrogen — a naturally occurring element that is responsible for around four-fifths of the earth's atmosphere

oxygen — a colorless, odorless gas that is 21 percent of our atmosphere essential for plant and animal respiration

tide — a raising and lowering of the water in the oceans and seas caused by the gravitational pull of the moon. The sun causes some, but to a lesser degree.

1. When Adam and Eve disobeyed God's commands, they allowed evil to enter the world. Bad weather is a result of the presence of sin in the world.
2. God created the world with a perfect design and order, which allows us to predict hours of daylight, seasons, and weather.
3. Answers will vary.
4. a. Tides: God placed the moon at exactly the right distance to maintain oceanic tides, which prevent flooding and pollution.
b. Seasons: God tilted the earth's axis; the earth's tilt and rotation creates seasons.
c. Temperature: God created just the right amount of gasses in the air to make sure the earth isn't too hot or too cold.

- d. Atmosphere: God created an atmosphere around the earth that shields it from harmful rays and meteors

What Causes Weather Chapter 2 Worksheet 1

arid — a dry climate lacking moisture

barometer — a weather instrument used to measure the pressure of the atmosphere

condensation — the act of water vapor changing from a gas to a liquid

dew point — the temperature at which air becomes saturated and dew forms

Doppler radar — a special type of radar used to track severe weather by detecting wind speed and direction

1. weather
2. a. temperature; b. precipitation; c. wind direction and speed; d. visibility; e. water vapor in the air; f. cloud conditions; g. air quality
3. The sun is responsible for differences in heating around the earth. At night, infrared radiation cools the earth, and the sunrise warms the earth during the day.
4. Clouds
5. The difference between daytime sunshine and nighttime infrared cooling causes temperature differences between the tropics and polar latitudes. These temperature differences cause air pressure changes, which push the earth's winds.
6. Because of the earth spinning on its axis, air flow in the atmosphere is more complicated. The spin causes air to move to the right in the Northern Hemisphere and to the left in the Southern Hemisphere. This deflecting force on the air is called the Coriolis force.
7. False; the Coriolis force moves in a counterclockwise rotation
8. The jet stream is caused by the difference in temperature between the tropical and polar latitudes.

The New Astronomy Book — Worksheet Answer Keys

What is Astronomy?

Introduction Worksheet 1

astronomical — part of or related to aspects within astronomy; also used to describe extremely large distances or amounts

comet — small bodies in space that contain frozen dust, gases, and even rocks that have orbits of their own; made up of a nucleus, often with a trail of particles and dust that follows it

astrophysics — the application of modern physics to the study of astronomy

astronomy — the study of heavenly bodies, things outside of the earth, including the sun, moon, and stars

spectroscopy — the study of spectra

1. To separate night and day; signs to mark sacred times, days, and years; to give light on the earth
2. Sun for the day, moon for the night
3. Verses 14–15
4. As being good
5. Day three

The Night Sky

Chapter 1 Worksheet 1

constellations — a group of stars that seems to form a pattern or shape

axis — an imaginary line, vertical and horizontal, around which a planet or other body rotates

celestial — a reference term related to the universe and objects within it

circumpolar — means “around the pole,” referring to stars that from a given location neither rise nor set but appear to circle the pole

revolution — circular motion around another body

pagan — refers to ancient cultures that were not based on Christianity, Islam, or Judaism

retrograde motion — when a planet appears to move east to west with respect to the stars, opposite from its normal motion

1. They don't rise or set, but instead move in a counterclockwise circle.
2. They appear to move clockwise around the south celestial pole; no, it does not.
3. Winter; summer
4. A NEO is a near earth object. NEOs include comets and asteroids close to earth; answers will vary.
5. No. Study of them can be traced back to ancient civilizations like Egypt, Greece, and Babylon.
6. The moon
7. A year; one month
8. Rotation
9. a. Mercury
b. Venus
c. Mars
d. Jupiter
e. Saturn
10. Uranus and Neptune

The Moon

Chapter 2 Worksheet 1

unmanned — refers to missions or spacecraft that do not have humans onboard to operate them in space

maria — Latin for “seas”; refers to the darker areas of the moon's surface, at lower elevations; so called because astronomers once thought they might be bodies of water

highlands — areas of the craters on the surface of the moon that appear lighter and are at a high elevation

lunar — referring to features and aspects related to and upon the moon

The Mineral Book — Worksheet Answer Keys

Where Do We Find Minerals

Chapter One Worksheet 1

rare minerals — Those minerals that are more uncommon, generally more valuable, and often harder to gather because of the process involved.

chemical interactions — The reaction that occurs when two or more chemicals are combined.

native mineral — A native element (or mineral) you pick up that looks like a rock, but is actually a mineral composed mostly of a metal.

evaporation — In drier coastal climates, near salty sea water or salt lakes, salt water is directed into shallow pools, where the wind and sun help evaporate the water and leave behind the salt.

deep-shaft mining — Much like regular mining for minerals like zinc and copper, this involves drilling shafts into the earth where salt deposits are found, crushing the salt, and bringing it to the surface, usually to be used as rock salt.

solution mining — Most table salt is made from gathering salt from salt beds and injecting water into the mix to remove the salt. This brine solution is then evaporated in salt pans at a processing plant.

1. 5,000
2. A covenant salt; a sign of an unbreakable agreement
3. New York; Ontario, Canada
4. They are often exposed to salty brine with little protective gear and very harsh weather conditions.
5. 1. Salt, 2. Iron, 3. Chromium, 4. Quarts, 5. Graphite, 6. Gypsum, 7. Clay

Where Do We Find Minerals

Chapter 1 Worksheet 2

1. By eating the right kind of food
2. “For the invisible things of him from the creation of the world are clearly seen, being understood by the things that are made, even

his eternal power and Godhead; so that they are without excuse”

3. “But without faith it is impossible to please him: for he that cometh to God must believe that he is, and that he is a rewarder of them that diligently seek him”
4. igneous (like lava), metamorphic (like marble) and sedimentary (like sandstone). All three kinds of rocks were formed both during the Creation week and the Flood year.
5. Praggers — slowed the racing mine cars down with sprags, pieces of wood used as manual breaks.
Nippers — would open the doors when the mule and driver pulling the coal cars passed through, often sitting alone in the damp darkness.
Mule drivers — older boys who helped bring down empty coal cars throughout the entire mine, and pulled out the loaded carts.
6. equipment, the land rights, environmental regulations, trained personnel, transportation, time of processing, etc.
7. marble
8. red and brown clay, as well as greens from malachite, blues from azurite, and yellows from fool’s gold.

What is a Mineral?

Chapter 2 Worksheet 1

geodes — Spherical and hollow stones that contain quartz crystals inside them.

Johannes Gutenberg (1395–1468) — Found a way to use copper and other metals to construct a printing press.

cuprous — Something that contains copper in the monovalent state.

cupric — Something that contains copper in the bivalent state.

compounds — Objects that contain two or more parts.

The New Ocean Book Worksheet Answer Keys

Introduction to the Oceans

Chapter 1 Worksheet 1

photosynthetic organisms — Free-floating ocean life that release oxygen.

Ring of Fire — A ring of volcanic activity that circles the Pacific Ocean.

1. Blue Planet
2. The Earth's oceans contain 97 percent of all the surface water on the planet. Filling an average depth of 2½ miles, Earth's oceans would cover the surface of her moon nine times!
3. Along with the atmosphere, the oceans help to regulate the climate and weather of the world.
4. Plants, tiny ocean organisms
5. "You alone are the Lord; You have made heaven, The heaven of heavens, with all their host, The earth and everything on it, The seas and all that is in them, And You preserve them all. The host of heaven worships You." — Nehemiah 9:6
6. Three-quarters
7. Pacific Ocean, Atlantic Ocean, Indian Ocean, Southern Ocean, and Arctic Ocean

Research and the Deep Oceans

Chapter 2 Worksheet 1

oceanography — the exploration and scientific study of phenomena associated with the world's seas, oceans, and their surrounding environment.

meteorology — Study that determines weather patterns.

1. zoology, physics, meteorology
2. chemical oceanography, physical oceanography, marine geology and geophysics, and biological oceanography
3. HMS *Challenger*, December of 1872, three and half years
4. life below 1,800 feet (549 m) was impossible
5. 1950

6. The book of Genesis states the earth began as a watery chaos thousands of years ago. Water was present from the beginning.

What is a Mineral?

Chapter 2 Worksheet 2

1. They extracted core samples from the ocean bottom. Scientists sometimes placed sensors into the hole to gather more information, such as temperature readings. Scientists examined, and continue to examine, the composition of the thin multicolored bands of core sediments.
2. They are stored in cold, hermetically sealed (airtight) rooms throughout the world.
3. exploration
4. satellites
5. 25,394
6. d.
7. a.
8. c.
9. b.

Physical Characteristics of the Ocean

Chapter 3 Worksheet 1

abyssal — A term used for animals, water, or land in the deepest part of the ocean, 13,000 feet (4,000 m) or deeper.

bathyscaph — A deep-diving submersible designed like a blimp. Its name means "deep ship."

continental shelf — The submerged land adjacent to a continent.

continental slope — Begins at the edge of the continental shelf and reaches into the ocean's greater depth.

1. The shoreline
2. 275,000 miles
3. The coast

The New Weather Book — Unit Quiz Answer Key

Unit One Quiz, Chapters 1-3

1. **climate** — the weather conditions that are particular to a certain area, such as wind, precipitation, and temperature
 2. **nitrogen** — a naturally occurring element that is responsible for around four-fifths of the earth's atmosphere
 3. **oxygen** — a colorless, odorless gas that is 21 percent of our atmosphere; essential for plant and animal respiration
 4. **precipitation** — falling moisture in the form of rain, sleet, snow, hail, or drizzle
 5. **cirrus clouds** — a high altitude cloud made of ice crystals that appears thin, white, and feathery
 6. **cold front** — a boundary of cold air, usually moving from the north or west, which is displacing the warm air
 7. **evaporation** — to change into a vapor such as the evaporation of water by the warming of the sun
 8. **stratus clouds** — low-altitude gray clouds with a flat base
 9. **warm front** — a boundary of warm air that is pushing out cold air in the atmosphere
 10. **water vapor** — invisible water distributed throughout the atmosphere
1. When Adam and Eve disobeyed God's commands, they allowed evil to enter the world. Bad weather is a result of the presence of sin in the world.
 2. God created the world with a perfect design and order, which allows us to predict hours of daylight, seasons, and weather.
 3. The sun is responsible for differences in heating around the earth. At night, infrared radiation cools the earth, and the sunrise warms the earth during the day.
 4. Cold front: line with triangles. Warm front: line with semicircles. Stationary front: line with triangles on top and semicircles on the bottom. Occluded front: line with alternating triangles and semicircles on top.
 5. Meteorologists can only interpret weather maps created by computers, which are not perfect. Despite all the tools they have, meteorologists do not have a complete understanding of the earth and its atmosphere.
 6. The general circulation is the average flow of air in various locations. The earth has six average circulations, which determines the climate in different areas.
 7. Rain falls from clouds in the sky and runoff goes into bodies of water that eventually go to the oceans. Water in the ocean evaporates into the atmosphere, where it turns into precipitation. Some water soaks deep into the ground, creating the water table.
 8. Stratus and cumulus
 9. Both are low-pressure systems, but warm fronts replace cold air with warm air, while cold fronts replace warm air with cold air. Cold fronts move faster than warm fronts. Both fronts bring precipitation.
 10. Most commonly, fog forms on clear nights when the temperature drops and the relative humidity rises to 100 percent, or the dew point. The air's water vapor condenses into liquid drops, forming fog.

Unit Two Quiz, Chapters 4-6

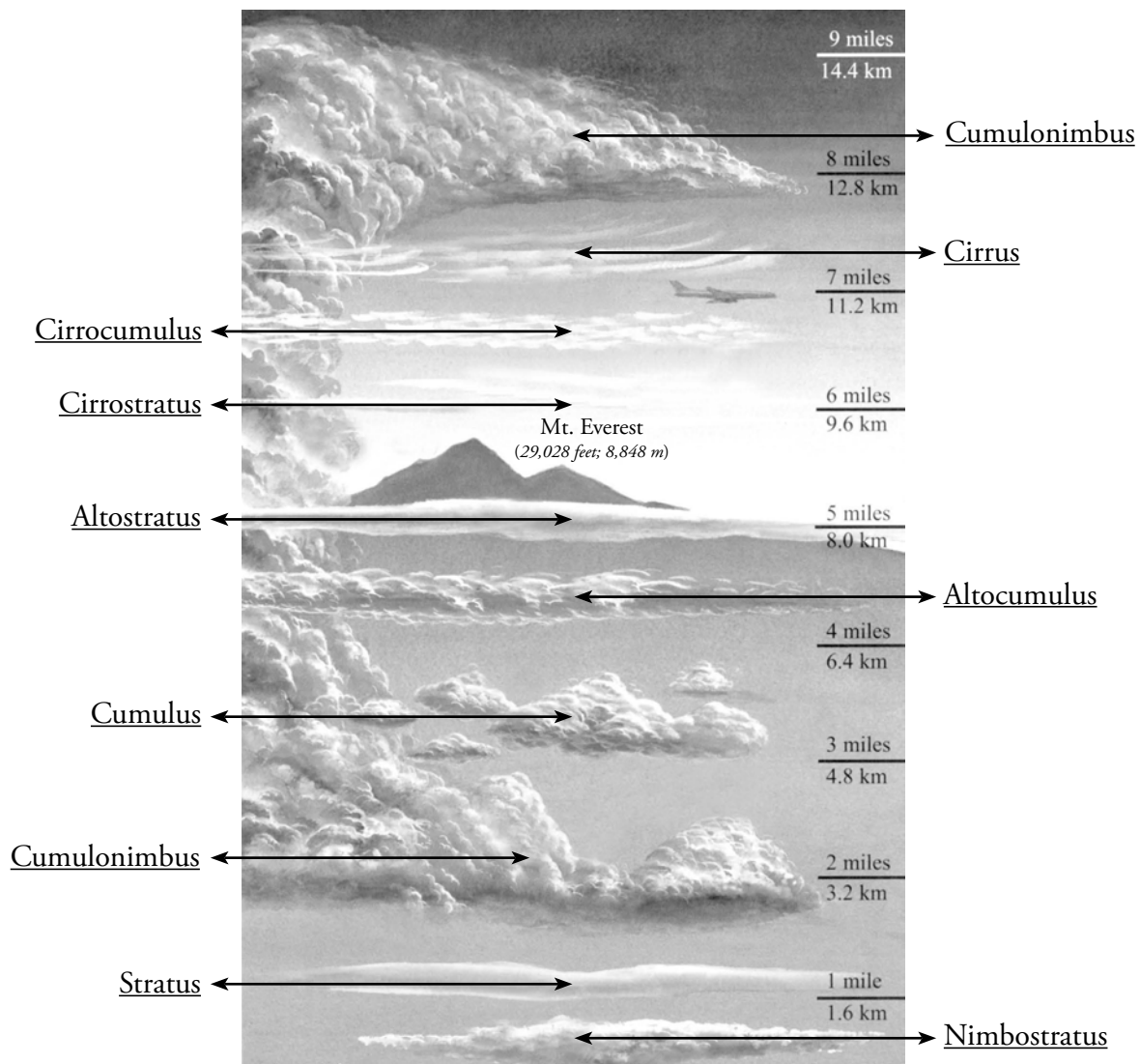
1. **electrons** — a subatomic particle with a negative electrical charge
2. **static electricity** — a build-up of electricity charge on an insulated body
3. **latent heat** — the energy released or absorbed at constant temperature during a change in phase
4. **supercell** — a severe, well-organized thunderstorm with warm, moist air spiraling upwards
5. **tornado** — a funnel-shaped column of air rotating up to 300 mph touching the ground
6. **supercooled drops** — drops of water that remain liquid below freezing

The New Weather Book — Test Answer Key

1. **cirrus clouds** — a high altitude cloud made of ice crystals that appears thin, white, and feathery
2. **stratus clouds** — low-altitude gray clouds with a flat base
3. **static electricity** — a build-up of electricity charge on an insulated body
4. **tornado** — a funnel-shaped column of air rotating up to 300 mph touching the ground
5. **blizzard** — a very heavy snowstorm with violent winds
6. **thermometer** — an instrument used to indicate the temperature
7. **El Niño** — a warm current from the west that replaces the cool ocean current along Peru and Ecuador
8. **ozone** — a gas in the earth's upper atmosphere that screens most of the sun's harmful ultraviolet radiation
9. **La Niña** — an ocean/atmospheric phenomenon that is the opposite of El Niño
10. **creation** — the formation of everything by God
 1. When Adam and Eve disobeyed God's commands, they allowed evil to enter the world. Bad weather is a result of the presence of sin in the world.
 2. The sun is responsible for differences in heating around the earth. At night, infrared radiation cools the earth, and the sunrise warms the earth during the day.
 3. The general circulation is the average flow of air in various locations. The earth has six average circulations, which determines the climate in different areas.
 4. Rain falls from clouds in the sky, and runoff goes into bodies of water that eventually go to the oceans. Water in the ocean evaporates into the atmosphere, where it turns into precipitation. Some water soaks deep into the ground, creating the water table.
 5. Count the number of seconds between the lightning and the thunder and divide the seconds by five to determine the distance in miles.
6. A tornado watch means conditions are favorable for a tornado to form. A tornado warning means a tornado or strong funnel cloud has been spotted.
7. Doppler radar detects wind speed and direction inside thunderstorms up to 20 minutes before a tornado touches ground.
8. Hurricane hunters are pilots who fly into hurricanes and drop weather sensors into the storm that send back information about the hurricanes' characteristics.
9. Snow's white color creates a high albedo, which means it reflects the sun, allowing the snow to melt slowly. This means the melted water soaks into the ground rather than causing floods.
10. Answers will vary, but they should include examples involving extreme cold, avalanches, heavy snow, frostbite, hypothermia, etc.
11. The side toward the wind, or the windward side, receives rain, while the side away from the wind, the leeward side, receives very little rain.
12. Areas in the United States along the east slopes of the Rocky Mountains from Alberta, Canada, to New Mexico.
13. St. Elmo's Fire is a high charge of electricity in the air that causes pointed objects to glow when thunderstorms are in the area.
14. The scientific method requires observation. Because past weather conditions cannot be repeated or observed, we can only make educated guesses, which does not fulfill the scientific method.
15. A scientist must make an assumption about a past climate, create a model based on that assumption, and test how well data observed in the present fits the model.
16. Volcanic ash blocked sunlight from entering the atmosphere, causing cooler temperatures. The volcanoes also warmed the water, creating more evaporation and greater amounts of snowfall in northern regions.
17. 1 Thessalonians 5:21: "Examine everything carefully; hold fast to that which is good"

(NASB).

18. Answers will vary, but possibilities include the heat island effect, changing instrument shelter location, placing shelters near heat sources, and changing instruments.
19. Hurricane landfalls, droughts, floods, tornadoes or thunderstorms, East Coast winter storms, heat waves, and cold spells.
20. Genesis 2:15: "The LORD God took the man and put him into the garden of Eden to cultivate it and keep it" (NASB).
- 21.



The New Astronomy Book — Unit Quiz Answer Key

Quiz One, Introduction – Chapter 3

1. **astronomy** — the study of heavenly bodies, things outside of the earth, including the sun, moon, and stars
 2. **spectroscopy** — the study of spectra
 3. **comet** — small bodies in space that contain frozen dust, gases, and even rocks, which have orbits of their own; made up of a nucleus, often with a trail of particles and dust that follow it
 4. **axis** — an imaginary line, vertical and horizontal, around which a planet or other body rotates
 5. **retrograde motion** — when a planet appears to move east to west with respect to the stars, opposite from its normal motion
 6. **maria** — Latin for “seas”; refers to the darker areas of the moon’s surface, at lower elevations; so called because astronomers once thought they might be bodies of water
 7. **highlands** — areas of the craters on the surface of the moon that appear lighter and are at a high elevation
 8. **lunar** — referring to features and aspects related to and upon the moon
 9. **satellites** — another word to describe moons that orbit planets
 10. **minor planets** — another name preferred by astronomers and given to bodies orbiting the sun that are also called asteroids, smaller than planets
1. They appear to move clockwise around the south celestial pole; no, it does not.
 2. A NEO is a near earth object.
 3. The moon
 4. Mercury, Venus, Mars, Jupiter, and Saturn
 5. Rotation
 6. When an object in space rotates on its axis at the same rate that it revolves around another body, like a planet; the moon
 7. Galileo
 8. It doesn’t. It reflects light it gets from the sun.
 9. The earth’s gravity pulls on the moon, causing the moon to orbit the earth. But the moon’s gravity also pulls on the earth and even alters its shape a little. The moon’s gravity also impacts the ocean tides.
 10. They knew the earth’s shadow caused lunar eclipses, and that it was always circular. They also realized that only a sphere casts a circular shadow.
 11. The corona is the outermost layer of the sun; prominences are loops of gas that follow the sun’s magnetic fields.
 12. Pluto, Eris, Ceres, Haumea, Makemake
 13. Mercury, Mars, Earth, Venus, Jupiter
 14. Saturn, Uranus, Neptune, Pluto
 15. Wearing out, collision with a planet, or being ejected from the solar system

Quiz Two, Chapters 4–7

1. **Astronomical unit** — a unit of distance, AU, which is based on the average distance between the earth and sun
2. **Density** — measure of how closely packed matter is, expressed in grams/cubic centimeter
3. **Rotation periods** — The period of time that it takes an object to spin on its axis once
4. **Galilean satellites** — refers to the four largest moons of Jupiter, named for the person who discovered them
5. **parallax** — the visual shift slightly back and forth each year of the stars, based on where we are viewing it from either side of earth’s orbit
6. **fission** — a process where a large atom, such as uranium, fissions or breaks into smaller atoms, releasing a lot of energy
7. **fusion** — smaller atoms combining into larger atoms, creating energy
8. **wavelengths** — refers to how long a light wave is
9. **electromagnetic radiation** — the name for invisible wavelengths of light
10. **infrared radiation** — also known as heat radiation, refers to the radiation that has

wavelengths longer than what is visible to the human eye

1. Because distances in space like miles and kilometers don't work well across vast areas; they would be enormous and impractical to use.
 2. Venus and Uranus
 3. terrestrial and jovian
 4. terrestrial
 5. Jovian
 6. The gravitational pull of moons, like those of Saturn, tear rings apart — making their chance of surviving millions or billions of years after being formed very unlikely.
 7. It traps the infrared radiation rather than letting it radiate away.
 8. Mars
 9. No; they think it has stayed closed to current temperatures.
 10. Photosphere
 11. They are regions of magnetic fields, and the sunspots in the pair have opposite polarity.
 12. Refractors and reflectors
 13. Different elements form different spectral lines so they can be used to tell the composition of the body.
 14. The phases of Venus, craters on the moon, and four moons orbiting Jupiter
 15. Eratosthenes; by measuring how high the sun was in the sky on the same date from two locations running along the north and south line. Then with the distance between the locations, the difference in the height of the sun in the two locations, he calculated the circumference of the earth.
4. **white dwarf stars** — stars that are a lot smaller than the sun, about the size of the earth, but they are so hot, they are white
 5. **extrasolar** — planets that orbit a star beyond our solar system
 6. **transit** — when a smaller body passes in front of a larger body; a type of eclipse where a much smaller body blocks out only a small portion of a bigger body's light
 7. **habitable zone** — the theoretical range of distance between a star and an orbiting planet that might have liquid water on the surface
 8. **star clusters** — groups of stars spaced much closer together than surrounding stars and held together by their gravity
 9. **interstellar medium** — thin gas and other small materials that exist between stars
 10. **Local Group** — the group of galaxies that includes the Milky Way and another spiral galaxy, M31
1. How bright a star appears to be to us
 2. Its temperature
 3. Hydrogen
 4. Magnitude
 5. Look for motion in the star as the planet orbits it
 6. By decreasing the amount of the brightness we see
 7. Less
 8. Open and globular
 9. Globular
 10. Open
 11. Yes
 12. About 100,000 light years
 13. Barred spiral galaxy
 14. They were solar systems in development.
 15. Virgo Cluster

Quiz Three, Chapters 8-11

1. **light years** — the distance that light travels in a year; used to express distances between stars and other space objects
2. **absolute magnitude** — how bright a star would be if it were at the standard distance of 10 parsecs
3. **parsec** — a unit of measure of distance that astronomers use that is equal to 3.26 light years

Quiz Four, Chapters 12-15

1. **dimension** — a fundamental quantity of space or time, usually associated with a direction and measured in meters or seconds
2. **Ex Nihilo** — Latin word that means “out of nothing”; can refer to the creation, when God created everything from nothing

3. **general relativity** — the current theory of gravity, and how it relates space and time to matter and energy
 4. **Hubble relation** — concept that redshifts and the distances of galaxies are related, such as the greater the redshift of a galaxy, the greater the distance of the galaxy
 5. **blueshifted** — when the Doppler shift moves light to shorter wavelengths (toward blue), indicating objects are moving toward us
 6. **standard candle** — an object for which we think we know the actual brightness, or absolute magnitude, that can be used to determine distances
 7. **quasars** — small, high redshift objects that likely are very far away and very bright
 8. **synchrotron radiation** — a special form of radiation created by very strong magnetic fields interacting with fast-moving charged particles
 9. **cosmology** — the study of the structure of the universe
 10. **filaments** — lines and flat or curved surfaces where galaxies seem to cluster
1. How we can see any galaxies if they are millions or billions of light years away if the universe is only 6,000 years old.
 2. Going long distances in a short period of time, manning spacecraft for long voyages taking into account the average human life span, vehicle design that provides food, shelter, care, water, and scientific study equipment
 3. Edwin Hubble in 1929
 4. How fast or slow an object or source of light is moving toward or away from us
 5. No
 6. They were thought to be supermassive black holes.
 7. 1950s
 8. It is not as bright as those being fed large amounts of matter.
 9. Yes, they are.
 10. A physicist or astronomer who specializes in the study of cosmology or structure of the universe
11. The horizon problem and the flatness problem
 12. Scientists changed the big-bang model to fit the data.
 13. Project Moon-Blink
 14. A larger expansion rate, inclusion of inflation and dark matter, dark energy, and the string theory
 15. Most of what were thought to be nebulae of the time were redshifted.

The New Astronomy Book — Test Answer Key

1. **parsec** — a unit of measure of distance that astronomers use that is equal to 3.26 light years
2. **minor planets** — another name preferred by astronomers and given to bodies orbiting the sun that are also called asteroids, smaller than planets
3. **electromagnetic radiation** — the name for invisible wavelengths of light
4. **Astronomical unit** — a unit of distance, which is based on the average distance between the earth and sun
5. **axis** — an imaginary line, vertical and horizontal, around which a planet or other body rotates
6. **wavelengths** — refers to how long a light wave is
7. **maria** — Latin for “seas”; refers to the darker areas of the moon’s surface, at lower elevations
8. **parallax** — the visual shift slightly back and forth each year of the stars, based on where we are viewing it from either side of earth’s orbit
9. **highlands** — areas of the craters on the surface of the moon that appear lighter and are at a high elevation
10. **light years** — the distance that light travels in a year; used to express distances between stars and other space objects
1. They appear to move clockwise around the south celestial pole; no, it does not.
2. Mercury, Venus, Mars, Jupiter, and Saturn
3. When an object in space rotates on its axis at the same rate that it revolves around another body, like a planet; the moon
4. The earth’s gravity pulls on the moon, causing the moon to orbit the earth. But the moon’s gravity also pulls on the earth and even alters its shape a little. The moon’s gravity also impacts the ocean tides.
5. The corona is the outermost layer of the sun; prominences are loops of gas that follow the sun’s magnetic fields.
6. Pluto, Eris, Ceres, Haumea, Makemake
7. Saturn, Uranus, Neptune, Pluto
8. Wearing out, collision with a planet, or being ejected from the solar system
9. Because distances in space like miles and kilometers don’t work well across vast areas; they would be enormous and impractical to use.
10. Venus and Uranus
11. terrestrial and jovian
12. The gravitational pull of moons, like those of Saturn, tear rings apart — making their chance of surviving millions or billions of years after being formed very unlikely.
13. It traps the infrared radiation rather than letting it radiate away.
14. Mars
15. No; they think it has stayed closed to current temperatures.
16. They are regions of magnetic fields, and the sunspots in the pair have opposite polarity.
17. Different elements form different spectral lines so they can be used to tell the composition of the body.
18. How bright a star appears to be to us
19. Its temperature
20. Hydrogen
21. Magnitude
22. By decreasing the amount of the brightness we see
23. Less
24. Open
25. Yes
26. Barred spiral galaxy
27. How we can see any galaxies if they are millions or billions of light years away if the universe is only 6,000 years old.
28. How fast or slow an object or source of light is moving toward or away from us
29. It is not as bright as those being fed large amounts of matter.
30. The horizon problem and the flatness problem

The Mineral Book — Quiz Answer Key

Quiz 1 Chapters 1–2 Each question 4 points

1. **evaporation** — In drier coastal climates, near salty sea water or salt lakes, salt water is directed into shallow pools, where the wind and sun help evaporate the water and leave behind the salt.
2. **deep-shaft mining** — Much like regular mining for minerals like zinc and copper, this involves drilling shafts into the earth where salt deposits are found, crushing the salt, and bringing it to the surface, usually to be used as rock salt.
3. **solution mining** — Most table salt is made from gathering salt from salt beds and injecting water into the mix to remove the salt. This brine solution is then evaporated in salt pans at a processing plant.
4. **geodes** — Spherical and hollow stones that contain quartz crystals inside them.
5. **inorganic** — Containing no plant or animal material.
 1. 5,000
 2. New York
 3. By eating the right kind of food
 4. “For the invisible things of him from the creation of the world are clearly seen, being understood by the things that are made, even his eternal power and Godhead; so that they are without excuse”
 5. “But without faith it is impossible to please him: for he that cometh to God must believe that he is, and that he is a rewarder of them that diligently seek him”
6. igneous (like lava), metamorphic (like marble), and sedimentary (like sandstone). All three kinds of rocks were formed both during the Creation week and the Flood year.
7. Answers may include equipment, the land rights, environmental regulations, trained personnel, transportation, time of processing, etc.
8. marble
9. Geodes are created in sedimentary and volcanic rock. The round or sphere-shaped oddities are formed because there are cavities inside them, often left behind from gas bubbles, which water and minerals pass through. The rock exterior hardens and crystals form on the inside.
10. God takes us and pours His Spirit into us, saving us and forming His beautiful life and power within us. No matter how ordinary one may look on the outside, if one is in Christ, He has made us so much more extraordinary than any geode!
11. We should make good and wise use of the things He created. Minerals are a precious gift to us. It is our job to find ways they can be used to glorify Him.
12. Answers should include four of the following:
 1. A mineral is a special group of compounds created by God.
 2. A mineral has a fixed chemistry.
 3. A mineral contains a crystalline structure.
 4. A mineral is inorganic.
 5. A mineral exists as a solid.
13. Naturally occurring and Mother Earth; they write God completely out of the picture!
14. Answers should include four of the following: cubic, tetragonal, orthorhombic, hexagonal, monoclinic, triclinic
15. “But my God shall supply all your need according to his riches in glory by Christ Jesus”

Quiz 2 Chapters 3–4 Each question 4 points

1. **mineralogy** — The part of geology that deals with the science of minerals.
2. **Friedrich Mohs (1773–1839)** — Developed the Mohs’ scale to help determine the hardness of minerals.
3. **symmetry** — The balance of opposite sides of an object in regard to size and form
4. **geologist** — One who studies the rocks and minerals of Earth, including how they formed.

5. **atonement** — A reconciling or repairing of a relationship, as done by Christ in His sacrifice so we could stand forgiven before God.

1. Chemistry
2. Crystallize, six
3. Creation
4. large, feet, evolutionary
5. Christ
6. It appears like broken glass.
7. Answers should include four of the following:
 1. Luster: Metallic to dull characteristics.
 2. Specific Gravity: Compares a mineral's weight to that of an equal volume of water.
 3. Color: Should never be the primary means of identification.
 4. Hardness: Mohs' scale measures this from 1 (soft) to 10 (hard).
 5. Streak: Scraping a mineral and examining this powder.
 6. Crystal Symmetry: Cubic, tetragonal, orthorhombic, hexagonal, monoclinic, or triclinic.
8. Cyprus, 1,000
9. "And he that sat was to look upon like a jasper and a sardine stone: and there was a rainbow round about the throne, in sight like unto an emerald."
10. "a good name is rather to be chosen than great riches"
11. The blood of Christ
12. It is thought that a birthstone representing each particular month of the year has its origin in the breastplate and the 12 stones the priests wore in the Old Testament.
13. "And I will make thy windows of agates, and thy gates of carbuncles, and all thy borders of pleasant stones."
14. God
15. "For the invisible things of him from the creation of the world are clearly seen, being understood by the things that are made, even

his eternal power and Godhead; so that they are without excuse."

Quiz 3 Chapters 5–6 Each question 4 points

1. **crystallize** — To change or form into solid crystals through a chemical process.
 2. **BIF** — Banded iron formation; in a rock this contains several kinds of iron ore
 3. **radioactive halos** — Concentric circles (circles within circles) left behind by radioactive decay.
 4. **radioactive atoms** — Atoms that are internally unstable so that they change by radioactive decay at a specific level.
 5. **radioactive decay** — The breakdown inside an atom that happens so it changes or decays to become stable.
1. "For other foundation can no man lay than that is laid, which is Jesus Christ. Now if any man build upon this foundation gold, silver, precious stones, wood, hay, stubble; Every man's work shall be made manifest: for the day shall declare it, because it shall be revealed by fire; and the fire shall try every man's work of what sort it is"
 2. Diamonds State Park in Arkansas
 3. 80%
 4. Unbreakable
 5. They were very competent in brass and iron metallurgy.
 6. "Pride goeth before destruction and an haughty spirit before a fall"
 7. simple, unevolved, stupid, metallurgy
 8. "He is the image of the invisible God, the firstborn of all creation. For by him all things were created: things in heaven and on earth, visible and invisible, whether thrones or powers or rulers or authorities; all things were created by him and for him, He is before all things, and in him all things hold together"
 9. "Favour is deceitful, and beauty is vain: but a woman that feareth the Lord, she shall be praised."
 10. Biotite
 11. Radiometric dating gives a false age of the earth.

12. because the mineral world was obviously designed by a wise and organized Creator
 13. “Having the glory of God: and her light was like unto a stone most precious, even like a jasper stone, clear as crystal”
 14. Assumptions include: radioactive atoms have all changed at a constant rate, and that there is a specific number of parent atoms to start with based on how many parent and daughter atoms they find in their sample. They also have to assume that all the daughter atoms were formed through radioactive decay.
 15. These assumptions do not take into account forces that could add to or impact the isotopes over the period of their existence.
6. by visiting gift shops in museums, collecting at an outcrop along the highway, or even trading minerals with a friend
 7. Always take a notebook, pencil or pen, a marker, and clear plastic bags that zip or tie closed.
 8. When you find a rock or mineral, write in your notebook where and when you found it. Place the rock in the baggie and use your marker (permanent ink) to write a number on the bag.
 9. Deep green
 10. “Lay not up for yourselves treasures upon earth, where moth and rust doth corrupt, and where thieves break through and steal: but lay up for yourselves treasures in heaven, where neither moth nor rust doth corrupt, and where thieves do not break through nor steal. For where your treasure is, there will your heart be also.”

Quiz 4 Chapters 7–8 Each question 4 points

1. **mineralogy** — A specialist study within geology that focuses on the properties of minerals.
 2. **crystallography** — The study of crystals, their specific properties and structures.
 3. **crystallographic symmetry** — Symmetry in crystal systems shows a beautiful balance in their creation.
 4. **inorganic chemistry** — Chemistry that focuses on non-living chemical interactions.
 5. **alloy** — A mixture or solution that combines a metal and other metals and elements
1. Jesus commended the woman for what she did, and further stated that wherever the gospel was preached, she would be remembered for her act of anointing.
 2. “Receive my instruction, and not silver; and knowledge rather than choice gold.”
 3. “The words of the Lord are pure words: as silver tried in a furnace of earth, purified seven times”
 4. Creation, Corruption, Catastrophe, Confusion, Christ, Cross, and Consummation
 5. “That in the ages to come he might shew the exceeding riches of his grace in his kindness toward us through Christ Jesus. For by grace are ye saved through faith; and that not of yourselves: it is the gift of God: Not of works, lest any man should boast. For we are his
11. loan it out to your local or school library, or take it to Sunday school, so others can enjoy it.
 12. share them so everyone can marvel at His amazing, creative design
 13. “He is the Rock, his work is perfect: for all his ways are judgment: a God of truth and without iniquity, just and right is he.”
 14. The destruction and suffering of divine judgment.
 15. Covenants

The Mineral Book — Test Answer Key

1. **symmetry** — The balance of opposite sides of an object in regard to size and form
2. **geologist** — One who studies the rocks and minerals of Earth, including how they formed.
3. **atonement** — A reconciling or repairing of a relationship, as done by Christ in His sacrifice so we could stand forgiven before God.
4. **crystallize** — To change or form into solid crystals through a chemical process.
5. **radioactive halos** — Concentric circles (circles within circles) left behind by radioactive decay.
 1. 5,000
 2. igneous (like lava), metamorphic (like marble), and sedimentary (like sandstone). All three kinds of rocks were formed both during the Creation week and the Flood year.
 3. We should make good and wise use of the things He created. Minerals are a precious gift to us. It is our job to find ways they can be used to glorify Him.
 4. Answers should include 2 of the following:
 1. A mineral is a special group of compounds created by God.
 2. A mineral has a fixed chemistry.
 3. A mineral contains a crystalline structure.
 4. A mineral is inorganic.
 5. A mineral exists as a solid.
 5. occurring and Mother Earth; they write God completely out of the picture!
 6. Chemistry
 7. Christ
 8. Answers should include 2 of the following:
 1. Luster: Metallic to dull characteristics.
 2. Specific Gravity: Compares a mineral's weight to that of an equal volume of water.
 3. Color: Should never be the primary means of identification.
 4. Hardness: Mohs' scale measures this from 1 (soft) to 10 (hard).
 5. Streak: Scraping a mineral and examining this powder.
 6. Crystal Symmetry: Cubic, tetragonal, orthorhombic, hexagonal, monoclinic or triclinic.
 9. The blood of Christ
 10. God
 11. They were very competent in brass and iron metallurgy.
 12. simple, unevolved, stupid, metallurgy
 13. Biotite
 14. Radiometric dating gives a false age of the earth.
 15. because the mineral world was obviously designed by a wise and organized Creator
 16. These assumptions do not take into account forces that could add to or impact the isotopes over the period of their existence.
 17. Creation, Corruption, Catastrophe, Confusion, Christ, Cross, and Consummation
 18. share them so everyone can marvel at His amazing, creative design

The New Ocean Book — Quiz Answer Key

Quiz 1 Chapters 1-3

1. e.
 2. f.
 3. h.
 4. g.
 5. d.
 6. c.
 7. a.
 8. b.
1. Along with the atmosphere, the oceans help to regulate the climate and weather of the world.
 2. Plants, tiny ocean organisms
 3. “You alone are the Lord; You have made heaven, The heaven of heavens, with all their host, The earth and everything on it, The seas and all that is in them, And You preserve them all. The host of heaven worships You.” — Nehemiah 9:6
 4. Pacific Ocean, Atlantic Ocean, Indian Ocean, Southern Ocean, and Arctic Ocean
 5. d.
 6. a.
 7. c.
 8. b.
 9. “Or who shut in the sea with doors, When it burst forth and issued from the womb; When I made the clouds its garment, And thick darkness its swaddling band; When I fixed My limit for it, And set bars and doors; When I said, ‘This far you may come, but no farther, And here your proud waves must stop!’” — Job 38:8-11
 10. Any four: wave action, currents, tides, the action of oysters, mussels, other sea creatures, and various types of vegetation
 11. The Mariana Trench
 12. It formed suddenly (violently) and includes “mature” looking beaches.

Quiz 2 Chapters 4-6

1. f.
 2. g.
 3. c.
 4. a.
 5. d.
 6. e.
 7. h.
 8. b.
1. Approximately 97%
 2. The kidneys need three liters of water for every liter of salt consumed. Due to the high salt content, drinking seawater speeds up the rate of dehydration and leads to a slow and painful death
 3. Less than one-tenth of one percent
 4. 90
 5. The fear of grounding a ship against uncharted reefs or sandbars, the flow of water is a powerful force, and sailors want to use this energy to their favor
 6. The law of gravitation
 7. The Gulf Stream
 8. Benjamin Franklin
 9. El Niño
 10. La Niña
 11. The Coriolis effect
 12. They drown due to storm-surge induced flooding.

Quiz 3 Chapters 7-9

1. f.
2. g.
3. b.
4. e.
5. h.
6. d.