

THE
WEATHER
BOOK

STUDY GUIDE
& WORKBOOK

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Printed in the United States of America

www.AnswersInGenesis.org

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Answer Key available at
www.answersingenesis.org/cec/guides.asp

1

Introduction to Weather

Text: Introduction (pp. 4–5)

Vocabulary Words:

atmosphere

climate

blizzard

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. Name three ways that weather can affect our daily lives.

3. Paul says, “All things were created by God, things in heaven and on earth, visible and invisible” (Colossians 1:16). Would you consider wind to be invisible? Why?

4. How is the Holy Spirit like the wind?

5. How long have seasons existed on the earth?

6. As a result of Adam and Eve’s sin against God, the weather was affected. What do you think the weather would have been like if man had never sinned?

Text: Chapter 1—God Created (pp. 6-7)

Vocabulary Words

ultraviolet light

carbon dioxide

ice age

tide

nitrogen

ozone

oxygen

pollution water

vapor

latitudes

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. What effect does the moon have on the earth?
3. What would happen to the earth if the moon were farther than 240,000 miles away?
4. Why do the sun and moon look the same size in the sky even though they are not?

5. Earth spins on its axis once every day. Why is that perfect for weather on Earth?

6. Why is the tilt of the earth's axis important to our weather?

7. What percentages of various gasses comprise our atmosphere?

8. Why is it important for fair-skinned people to apply sunscreen when out in the sun for extended periods of time?

9. How many meteors hit the earth's atmosphere each day?

10. What happens to most of these meteors?

2

Chapter 2 Part 1

Text: What Causes Weather? (pp. 8–9)

Vocabulary Words

Coriolis force

precipitation

axis

equator

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.

2. Name the seven main components of weather.
3. What are the five main forms of precipitation?
4. What happens to sunlight that reaches the ground?
5. What is infrared radiation?
6. How does infrared radiation affect the temperatures in summer and in winter?
7. As the air is forced upwards from the Coriolis force, what is formed?

Text: World Climate Zones (pp. 10–11)

Vocabulary Words

ice cap

arid

tropical

humid

subarctic

tundra

Discussion Questions

1. Locate the vocabulary words in the glossary. Write a definition for each.
2. The weather may change from day to day, or season to season, but climate is the average weather condition for a particular place at a particular time. Look at the world climate map on page 11. Locate where you live. By using the key at the bottom of the map, classify your climate. Describe it briefly using five words.
3. Are there any tropical rain forests found in the high or mid latitudes? Why?

3

Chapter 2 Part 2

Text: Weather Facts (pp. 12–13)

Vocabulary Words

monsoon

typhoon

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. What was the highest recorded surface wind speed?

3. Why does the air above snow stay so cold?

4. Which two American states tied for the largest amount of rainfall in one hour?

5. Where is the lowest air pressure found (naturally) on Earth?

6. Why is the Antarctic ice sheet called a polar desert?

7. Write a poem about your favorite weather fact.
Remember, poems don't have to rhyme, but they should express a strong feeling or emotion.

Text: How to Read a Weather Map (pp. 14–15)

Vocabulary Words

cold front

dew point

meteorologist

warm front

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition of each word.
2. What are two types of weather observations?
3. How often are the measurements taken for each observation?
4. What role do computers perform in predicting the weather?
5. Even with a computer, why is it sometimes difficult for a meteorologist to predict the weather?

6. Suppose you are planning an outdoor activity, such as hiking or camping, for the next day. When you watch the weather report, do you hope to see an approaching high pressure or low pressure area? Explain your choice.
7. Look at the graphic symbols on page 14 that are used by weather forecasters. Design some new ones that could be used for the following weather conditions: sunshine, partly cloudy, rain and thunderstorm.

Text: Jet Stream (pp. 16–17)

Discussion Questions

1. What is the jet stream?
2. What causes the jet stream?
3. What is the average speed of the jet stream during the summer and winter months?

4. What effect does the jet stream have on the weather?

5. Which direction do storms generally move?

6. Does the wind speed stay the same in the jet stream?
Explain your answer.

7. Why are jet stream charts important to meteorologists?

8. How fast would a balloon circle the world if placed in the jet stream?

Text: El Niño (pp. 18–19)

Vocabulary Words

El Niño

plankton

Discussion Questions

1. Locate the vocabulary words in the glossary and write the definition for each.
2. Name at least three unpleasant effects of El Niño on the lives of people in Peru and Ecuador.
3. What are some of the things that scientists are trying to learn about El Niño?
4. Why is the warm weather condition of El Niño not good for fishermen?

Unit One Quiz

Text: pages 4–20

Questions

1. What effect does the moon have on the earth?
2. Why is the tilt of the earth's axis important to the weather?
3. Name the seven main components of weather.
4. What are the five forms of precipitation?
5. How does the distance from the ocean affect the weather?

6. Why is the Antarctic ice sheet called a polar desert?

7. Which is associated with good weather, high or low areas of pressure?

8. What is the jet stream?

9. What is one of the major problems that El Niño brings to people in Peru and Ecuador?

4

Chapter 3

Text: Water in the Atmosphere (pp. 20–21)

Vocabulary Words

condensation

evaporation

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. Half of the water for rain or snow comes from plants, wet ground, rivers and lakes. Where does the other half come from?

3. When ocean water evaporates into the air as water vapor, what replaces it?
4. Where the water table is deep in the ground, the land is dry. Where in the world is this the case? (Use the map on page 11.)
5. Runoff from rainstorms carries chemicals from the soil to the ocean. If the chemical composition is off-balance and becomes harmful to plankton, how could the rest of the ocean suffer?

Text: Clouds (pp. 22–25)

Vocabulary Words

cirrus clouds

convection clouds

cumulus clouds

fog

relative humidity

stratus clouds

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. How do clouds form?
3. Which holds more water: warm air or cool air?
4. What do fog, mountain clouds, convection clouds, and frontal clouds all have in common?
5. What are the three basic cloud types?
6. When are cumulus clouds usually seen?
7. Which of the three basic cloud types contain ice crystals?
8. Which cloud type is found at low altitudes?
9. Clouds are classified according to their _____ in the sky.

10. Which two cloud types may contain rain?

Text: Warm Fronts and Cold Fronts (pp. 26–29)

Discussion Questions

1. What is a warm front?
2. What causes most cloud and precipitation formation?
3. What force pulls water droplets to the ground?
4. What are the indications of an approaching warm front?
5. What weather conditions occur along with a warm front?
6. From which direction do cold fronts usually come in the northern hemisphere?
7. Which is more dense: cold air or warm air?
8. During summer, what weather conditions indicate that a cold front is passing through?

Text: Fog (pp. 30–31)

Discussion Questions

1. List and describe the four types of fog.
2. The air can hold no more water when it reaches its _____.
3. When could fog prove to be hazardous to people?
4. What is the difference between fog and clouds?
5. Which types of fog occur over water?
6. Which types of fogs occur over land?

5

Chapter 4

Text: Thunderstorms (pp. 32–35)

Vocabulary Words

electricity

thunderstorm

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. Where do most of the world's thunderstorms occur?
3. From which cloud type do thunderstorms develop?

4. Why is there a better chance of a thunderstorm occurring in the afternoon than in the morning or late at night?
5. What causes a cumulus cloud to change into a huge towering cumulus?
6. Why does a cumulus cloud stop growing when it hits the stratosphere?
7. In what ways are thunderstorms blessings from God?
8. How can thunderstorms remind us that God has promised to never flood the earth again?

Text: Lightning (pp. 36–37)

Vocabulary Words

electrons

static electricity

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. How is lightning like static electricity?
3. What is thunder?
4. What does lightning sound like when it is near?
5. How fast does thunder travel?
6. Which travels faster: thunder or lightning? Why?
7. Are electrons negatively charged or positively charged?
8. Is the ground positively charged or negatively charged?
9. What are some problems with the following theory?
Lightning is formed when electricity builds up in the cloud as a result of ice particles collecting.
10. A large amount of energy is released with each lightning bolt. If scientists could somehow harness this energy, in what ways could it be used to help mankind?

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Chapter 5

Text: Dangerous Thunderstorms (pp. 38–39)

Vocabulary Words

flash flood

updraft

downdraft

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. What percentage of yearly thunderstorms in the United States are considered dangerous?
3. How has God provided for our safety in dangerous weather?

4. What conditions are needed for a thunderstorm to develop? What is needed for a severe thunderstorm?

5. What geographical features contribute to severe thunderstorms in the United States?

6. Which regions of the United States receive the highest number of severe thunderstorms?

7. Look at the map of the United States on page 38. Florida has the most thunderstorms per year. Why?

8. Which three states have fewer than ten thunderstorms each year?

9. Name three reasons that flash floods occur.

10. Nearly half of the people that die in flash floods do so in their cars. In your opinion, how could such future deaths possibly be prevented?

Text: Hail and Wind Damage (pp. 40–41)

Vocabulary Word

hailstones

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. Which cloud type is associated with hail?
3. Describe the formation of a hailstone.
4. What factors determine how fast hail falls to Earth?

5. If you find a hailstone consisting of a large amount of cloudy ice, what can you deduce about how it was formed?

6. True or false: all hailstones are smooth and round. Explain your answer.

7. What damage can be caused by hailstorms?

8. Describe three safety tips helpful for those experiencing a hailstorm.

9. What damage can be caused by a windstorm?

Text: Tornadoes (pp. 42–47)

Vocabulary Words

Doppler radar

supercell

tornado

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. What is the difference between tornadoes and hurricanes?
3. What is the difference between how tornadoes and thunderstorms form?
4. Who are storm-chasers?
5. A tornado forms in a certain spot under a thunderstorm. Where is that spot?

6. Describe the most-dangerous tornadoes. Tell what they look like, how fast they move and how far they can travel.

7. Why are tornadoes considered unpredictable?

8. What does a “tornado watch” indicate?

9. What does a “tornado warning” indicate?

10. What makes a tornado visible?

11. Where do the largest number of waterspouts occur?

Unit Two Quiz

Text: pages 20–47

Questions

1. Describe the path that a drop of water takes as it cycles through the atmosphere.
2. What are the three basic cloud types?
3. Under what conditions are most clouds and precipitation formed?
4. What is the difference between fog and clouds?
5. From which cloud type does a thunderstorm develop?

6. How is thunder created?

7. What three conditions are needed to develop a thunderstorm?

8. During the formation of hail inside a cloud, what processes are happening to the water drop as it travels to the top of the cloud?

9. How is lightning similar to static electricity?

10. Name one reason that a flash flood occurs.

11. What is the difference between tornadoes and hurricanes?

12. What does a “tornado watch” indicate?

13. What does a “tornado warning” indicate?

7

Chapter 6

Text: Hurricanes (pp. 48–53)

Vocabulary Words

Intertropical

Convergence Zone

tropical depression

tropical storm

hurricane

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.

2. What is a monsoon?
3. List and describe the three storm types that occur in the tropics.
4. How are hurricane hunters similar to tornado chasers?
5. How are scientists able to predict the months during which hurricanes will most likely form?
6. Where is the eyewall located in a hurricane?
7. How does barometric pressure affect wind speeds in a hurricane?
8. What do the Japanese call a hurricane? The Australians?

9. What causes nine out of ten deaths in a hurricane?

10. What causes the sea level to rise as a hurricane passes overhead?

11. What were the geographical and economic factors in Bangladesh that caused so many deaths during the hurricane of 1970?

12. What killed most of the people who died after Hurricane Andrew passed through?

13. What is the National Weather Service's National Hurricane Center?

14. How has this agency been able to save lives?

15. How is Doppler radar useful in tracking hurricanes?

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Chapter 7

Text: Winter Storms (pages 54–59)

Vocabulary Words

ice storms

Northeaster

sleet

wind chill factor

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. What causes the earth's seasons?
3. What causes temperatures to be cooler in the winter?

4. What causes temperatures to be warmer in the summer?
5. What are the seasons in the tropics like?
6. Why do the west coasts of the United States, Canada and Europe very seldom have snow?
7. What would happen if snow melted as soon as it hit the ground?
8. Describe some benefits of winter rainstorms to the southern United States.
9. In California, what problems result from heavy rainstorms?
10. What weather conditions determine if a snowstorm is called a “blizzard”?
11. What is a “Northeaster”?
12. What causes ice storms?
13. What problems do ice storms and winter storms cause?

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Chapter 8

Text: Wild Weather (pp. 60–63)

Vocabulary Words

chinook

winds

Santa Ana

winds

St. Elmo's Fire

ball lightning

Discussion Questions

1. Locate the vocabulary words in the glossary and write the definition for each.

2. When does “St. Elmo’s Fire” normally occur?
3. What causes the continuous rainfall at Mt. Waialeale?
4. Which American state has both a rain forest and a desert?
5. What is a foehn wind?
6. What cloud type makes up the foehn wall?
7. What are foehn winds called in the United States?
8. What damages can chinooks cause?
9. Describe the effect an arctic cold front has on the Great Lakes area.
10. Describe a “lake effect snowstorm.”
11. Describe “ball lightning.”

Unit Three Quiz

Text: pages 42–63

Questions

1. What causes the earth to have seasons?
2. What causes temperatures to be cooler in the winter?
3. What causes temperatures to be warmer in the summer?
4. What weather conditions determine if a snowstorm is called a “blizzard”?
5. What is a monsoon?

10

Chapter 9

Text: Climate in the Past (pp. 64–65)

Discussion Question

1. Why do scientists believe the earth's climate may have been different in the past?

For more information, read about Buddy Davis's Alaskan dinosaur adventure in *The Great Alaskan Dinosaur Adventure!*

Text: Noah's Flood—Key to the Past (pp. 66–67)

Discussion Questions

1. Why is it important that one understands the assumptions one has about the past?

2. What does the uniformitarian model assume about the past?

3. What does the biblical view assume about the past?

4. Why is Noah's Flood considered key when understanding past geological events?

5. What are some problems with trying to fit uniformitarian assumptions into the biblical view?

6. Why is there, technically, no such thing as "prehistoric past"?

See also www.AnswersInGenesis.org/Flood, www.AnswersInGenesis.org/geology, www.AnswersInGenesis.org/fossils

Text: The Ice Age (pp. 68–69)

Vocabulary words

permafrost

bogs

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. Describe how Noah's Flood caused the Ice Age.
3. How long did the Ice Age last?
4. Why has the Ice Age ended?

For more information, see www.AnswersInGenesis.org/IceAge and www.AnswersInGenesis.org/mammoth

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Chapter 10

Text: Future Climate (pp. 70–73)

Vocabulary Words

greenhouse warming

environment

fossil fuels

ozone

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.
2. Why should the Ice Age be considered a “one-time” event?

3. How does carbon dioxide affect the earth's atmosphere?

4. What causes the amount of carbon dioxide in the atmosphere to increase?

5. What are potential effects of increased "greenhouse" gases in the atmosphere?

6. What variables can cause fluctuations in the thickness of the ozone layer?

7. Explain how the existence of the ozone layer presents serious problems for those who believe in evolution.

12

Chapters 11–12

Text: Observing the Weather (pp. 74–77)

Vocabulary words

weather vane

thermometers

barometer

weather balloons

rain gauge

Discussion Questions

1. Locate the vocabulary words in the glossary. Write the definition for each.

2. You are able to observe the current weather situation in just about any part of the world by logging on to weather.com. For one week, chart the weather pattern of a place on the opposite side of the world from where you live. How does it compare to the weather in your area?

Text: God, Creation, and You (pp. 78–79)

Discussion Questions

1. God gave Adam dominion over His creation (Genesis 1:28). How should we apply the “dominion mandate” to our lives today?
2. Define “pantheism.” How is this different from the biblical view of God?
3. Even more important than caring for the earth itself is caring for the eternal lives of those who live on the earth. How are you involved in sharing the good news of the Creator who became our Savior with those around you?

Unit Four Quiz

Text: pages 64–79

Questions

1. Contrast the uniformitarian view of the past with the biblical view of history.
2. Describe how the Flood of Noah's day would have initiated an Ice Age.
3. Why should the Ice Age be considered a one-time event?
4. How does the ozone layer impact life on Earth?

