

# Weather Guided Reading Packet

## Chapter 3

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Name

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Period

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Room Number

**CHAPTER 3**

**WEATHER PATTERNS**

**SECTION 3-1 Air Masses and Fronts**  
(pages 76-82)

*This section describes huge bodies of air, called air masses, and explains how they move. The section also explains how the meeting of different air masses affects weather.*

**► Introduction (page 76)**

1. What is an air mass? \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

**► Types of Air Masses (pages 76-78)**

2. Scientists classify air masses according to \_\_\_\_\_ and \_\_\_\_\_.
3. Is the following sentence true or false? Polar air masses have low air pressure. \_\_\_\_\_
4. Complete the compare/contrast table.

Types of Air Masses and Their Characteristics	
Type of Air Mass	Characteristics
	Warm and humid
	Cool and humid
	Warm and dry
	Cool and dry

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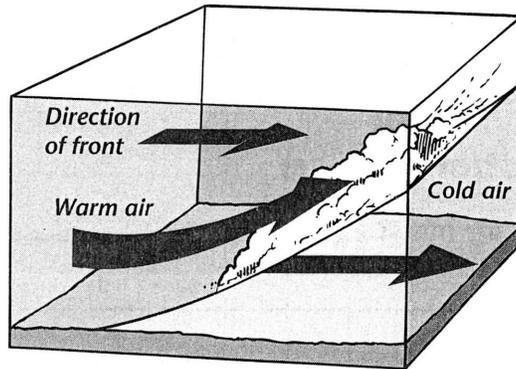
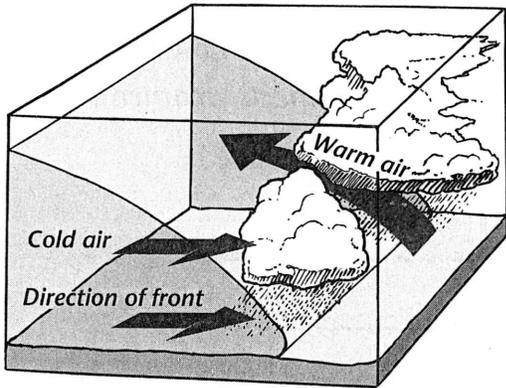
**CHAPTER 3, Weather Patterns** (continued)

► **How Air Masses Move** (page 79)

5. In the continental United States, major wind belts generally push air masses from \_\_\_\_\_ to \_\_\_\_\_.

► **Fronts** (pages 79–81)

6. Label the drawings to indicate a cold front and a warm front.



Match the type of front with how it forms.

Type of Front	How It Forms
_____ 7. cold front	a. A moving warm air mass collides with a slowly moving cold air mass.
_____ 8. warm front	b. A warm air mass is caught between two cooler air masses.
_____ 9. stationary front	c. A rapidly moving cold air mass runs into a slowly moving warm air mass.
_____ 10. occluded front	d. A cold air mass and a warm air mass meet and remain stalled over an area.

11. Circle the letter of each sentence that is true about fronts.

- a. Cold fronts can cause violent thunderstorms.
- b. Warm fronts are associated with clouds and rain.
- c. Stationary fronts may bring many days of clouds and precipitation.
- d. Occluded fronts always bring fair weather.

► **Cyclones and Anticyclones** (pages 81–82)

12. A swirling center of low air pressure is called a(n) \_\_\_\_\_.

13. Is the following sentence true or false? Winds spiral inward toward the center of a cyclone. \_\_\_\_\_

14. What type of weather is associated with cyclones? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

15. Is the following sentence true or false? Winds in an anticyclone spin clockwise in the Northern Hemisphere. \_\_\_\_\_

16. What type of weather is associated with anticyclones? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

.....

**SECTION** **Storms**  
**3-2** (pages 83–91)

*This section explains how thunderstorms, tornadoes, hurricanes, and snow storms form. The section also describes how people can stay safe in the different types of storms.*

► **Introduction** (page 83)

1. What is a storm? \_\_\_\_\_

\_\_\_\_\_

► **Thunderstorms** (pages 84–85)

2. Circle the letter of the type of clouds in which thunderstorms form.

- a. cumulus
- b. nimbus
- c. nimbostratus
- d. cumulonimbus

3. A sudden energy discharge between parts of a cloud, between nearby clouds, or between a cloud and the ground is called \_\_\_\_\_.

**CHAPTER 3, Weather Patterns** *(continued)*

4. Circle the letter of each sentence that is true about thunder.
- a. It is the sound of an explosion.
  - b. It occurs after lightning.
  - c. It occurs because lightning heats the air.
  - d. It occurs because light travels faster than sound.
5. Circle the letter of each sentence that is a way to stay safe in a thunderstorm.
- a. Avoid touching metal objects.
  - b. Get out of the water.
  - c. Don't use the telephone.
  - d. Get out of your car and go under a tree.

► **Tornadoes** (pages 85–88)

6. What is a tornado? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
7. Is the following sentence true or false? Tornadoes develop in the same clouds that bring thunderstorms. \_\_\_\_\_
8. Circle the letter of each sentence that is true about where and when tornadoes occur.
- a. Tornadoes are most likely in late summer and early fall.
  - b. Tornadoes occur often in the Great Plains.
  - c. Tornadoes occur more often in the United States than in any other country.
  - d. Tornadoes occur in just a few parts of the United States.
9. Where is the safest place to be during a tornado? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

► **Hurricanes (pages 88–90)**

10. Circle the letter of each sentence that is true about a hurricane.
- a. It is a tropical storm.
  - b. It has winds of at least 159 kilometers per hour.
  - c. It is typically about 60 kilometers across.
  - d. It forms over water.
11. The quiet center of a hurricane is called the \_\_\_\_\_.
12. Is the following sentence true or false? Hurricanes do not last as long as other storms. \_\_\_\_\_
13. A “dome” of water that sweeps across the coast where the hurricane lands is called a(n) \_\_\_\_\_.
14. Is the following sentence true or false? If you hear a hurricane warning and are told to evacuate, you should leave the area immediately.

\_\_\_\_\_

► **Winter Storms (pages 90–91)**

15. When does snow fall? \_\_\_\_\_
- \_\_\_\_\_
16. Circle the letter of each sentence that is true about lake-effect snow.
- a. It occurs in Detroit and Chicago.
  - b. It occurs because land cools more rapidly than water.
  - c. It occurs on the south and west sides of the Great Lakes.
  - d. It occurs when humid air rises and cools over land.
17. What should you do if you are caught in a snowstorm? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

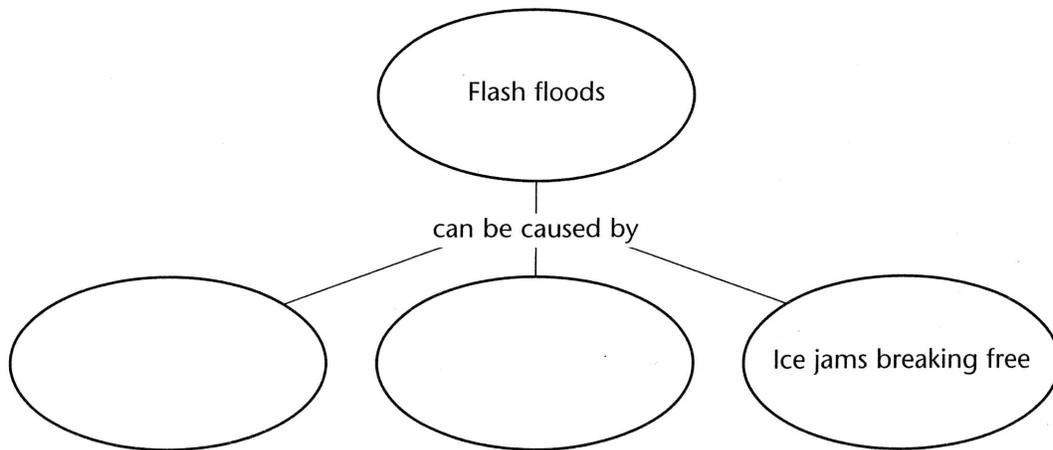
## CHAPTER 3, Weather Patterns (continued)

### SECTION **Floods** 3-3 (pages 95-98)

This section explains why floods occur and describes how to stay safe in floods.

#### ► Flash Floods (page 96)

1. Is the following sentence true or false? Floods are the most dangerous weather-related events in the United States. \_\_\_\_\_
2. A sudden, violent flood that occurs within a few hours, or even minutes, of a storm is called a(n) \_\_\_\_\_.
3. Complete the concept map.



#### ► Flood Safety Measures (pages 96-98)

4. Why do scientists try to predict floods? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
5. An announcement describing the area in which flooding is possible is a(n) \_\_\_\_\_.
6. An announcement that floods have already been reported or are about to occur is a(n) \_\_\_\_\_.

Name \_\_\_\_\_ Date \_\_\_\_\_ Class \_\_\_\_\_

7. What is the first rule of flood safety? \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

8. Circle the letter of each choice that is a flood hazard.

- a. power outages
- b. landslides
- c. polluted drinking water
- d. interruption of emergency services



### **Reading Skill Practice**

As you read, identifying the sentence that best expresses the main topic under each heading can help you focus on the most important points. For each heading in Section 3-3, identify and copy the sentence that best expresses the main topic under that heading. Do your work on a separate sheet of paper.

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### CHAPTER 3, Weather Patterns *(continued)*

#### ► Weather Technology (page 101)

3. In what two areas have changes in technology occurred in weather forecasting? \_\_\_\_\_  
\_\_\_\_\_
4. Is the following sentence true or false? Weather forecasts for over three days into the future are never reliable. \_\_\_\_\_
5. Circle the letter of each sentence that is true about weather balloons or weather satellites.
  - a. Weather balloons carry instruments as high as the stratosphere.
  - b. Weather balloons carry computers to analyze weather data.
  - c. The first weather satellite was launched in 1940.
  - d. Weather satellites take pictures of Earth from the exosphere.
6. Circle the letter of each sentence that is true about computer forecasts of the weather.
  - a. Computers are rarely used to help forecast weather.
  - b. Computer forecasts are based on weather conditions from many weather stations.
  - c. Computers only make long-term forecasts of a week or more.
  - d. When new weather data come in, computers revise their forecasts.

#### ► El Niño (page 102)

7. A warm-water event that occurs periodically in the Pacific Ocean is called \_\_\_\_\_.
8. Circle the letter of each sentence that is true about El Niño.
  - a. When it occurs, warm surface water is pushed toward South America.
  - b. It replaces cold water that usually rises to the surface near the coast of South America.
  - c. It occurs once every five to ten years.
  - d. It can affect weather patterns in places as far away as Florida.

► **Reading Weather Maps** (pages 102-105)

9. What data are shown on a weather map? \_\_\_\_\_

\_\_\_\_\_

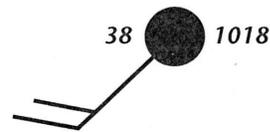
\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

10. What are the temperature, air pressure, and wind direction at the weather station represented by the symbol shown here? \_\_\_\_\_



\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Match the term with its definition.

Term	Definition
_____ 11. isobars	a. Lines on a weather map joining places that have the same temperature
_____ 12. isotherms	b. Lines on a weather map joining places that have the same air pressure

► **The Butterfly Effect** (page 104)

13. Why is weather forecasting tricky, even with current technology?

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

14. Is the following sentence true or false? The butterfly effect refers to the fact that a small change in the weather today can mean a larger change in the weather a week later. \_\_\_\_\_

**CHAPTER 3, Weather Patterns** (continued)

**WordWise**

Solve the clues by filling in the blanks with key terms from Chapter 3. Then write the numbered letters in the correct order to find the hidden message.

**Clues**

**Key Terms**

Violent disturbance in the atmosphere

— — — — —  
1 2

Type of air mass that forms north of 50° north latitude or south of 50° south latitude

— — — — —  
3 4

Type of air mass that forms over oceans

— — — — —  
5

Lines on a map joining places that have the same air pressure

— — — — —  
6 7 8

Type of front in which a warm air mass is cut off from the ground by cool air beneath it

— — — — —  
9 10

Type of air mass that forms in the tropics

— — — — —  
11

A sudden spark when electrical charges jump between nearby clouds or parts of a cloud or between a cloud and the ground

— — — — —  
12 13

Lines on a map joining places that have the same temperature

— — — — —  
14 15

Rapidly whirling, funnel-shaped cloud that reaches down from a storm cloud to touch Earth's surface

— — — — —  
16

Tropical storm with winds of 119 kilometers per hour or higher

— — — — —  
17

Scientist who studies the causes of weather and tries to predict it

— — — — —  
18

**Hidden Message**

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18