Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Storms Short Study Guide

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

____ 1. A(n) ____ thunderstorm forms because of unequal heating of Earth's surface within one air mass.
a. frontal mass
b. cold front
c. air mass
d. air pressure

____ 2. The rising, moist updrafts and the falling, cool downdrafts form a convection cell that produces the ____ associated with thunderstorms.
a. temperatures
b. thunder
c. humidity
d. gusty surface winds

____ 3. Very severe thunderstorms can form when a ____ has a large continuous supply of warm air to lift and condense.
a. cold front
b. warm air mass
c. warm front
d. tornado

____ 4. When friction between updrafts and downdrafts within a cumulonimbus cloud creates regions of air with opposite charges, ____ forms.
a. warm air
b. lightning
c. precipitation
d. ozone

____ 5. ____ are often associated with very severe thunderstorms called supercells.
a. Tornadoes
b. Sea breezes
c. Hurricanes
d. Heat waves

____ 6. A mound of water driven toward coastal areas by hurricane winds is called a ____.
a. cyclone
b. supercell
c. storm surge
d. cold front

____ 7. An extended period of well-below-normal rainfall is a ____.
a. flood
b. drought
c. heat wave
d. tropical cyclone

____ 8. The phenomenon in which the effects of cold air are worsened by wind is the ____.
a. supercell
b. sea breeze
c. wind chill factor
d. cold wave

____ 9. Which of the following conditions does NOT contribute to the formation of hail?
a. the ability of water droplets to exist in a liquid state in parts of a cloud where the temperature is below freezing
b. the encounter between supercooled water droplets and ice pellets
c. the dissipation of warm, moist air at the Earth's surface by downdrafts
d. the existence of strong updrafts and downdrafts side by side within a cloud

Matching

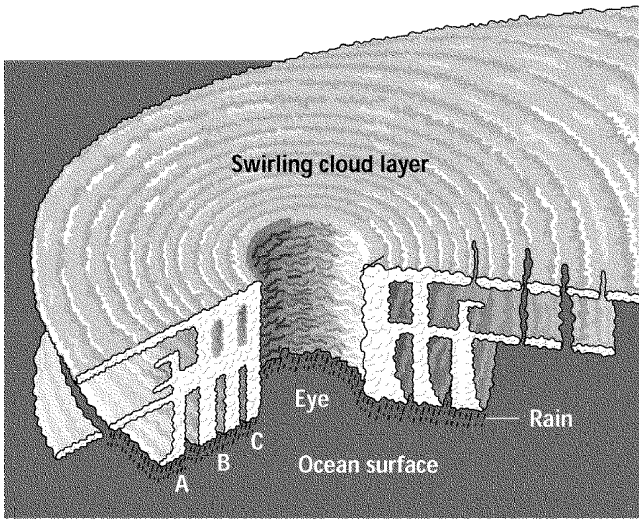
Match each item with the correct description below.

a. cold wave
b. drought
c. heat wave

____ 10. High pressure associated with continental polar or arctic air
____ 11. Large, persistent high-pressure system associated with extended periods of below-normal rainfall

Short Answer

12. Describe the formation of a frontal thunderstorm.
13. Which lettered area of the hurricane shown below would produce the greatest wind damage? Explain.



14. Describe a drought and the problems it can cause.

Compare and contrast each pair of related terms or phrases.

15. supercell, downburst
16. tornado, tropical cyclone
17. What makes some thunderstorms more severe than others?
18. Describe the weather pattern that causes droughts, and explain how it is similar to the weather pattern that causes a heat wave.
19. Could a hurricane form over the northern Atlantic, off the eastern coast of Canada? Explain your answer.

20. A Category 4 hurricane has just become a Category 5. Explain what has happened to air pressure in the storm and the strength of its winds.

Table 1 shows the effect on water level of a strong thunderstorm moving through the Green River area. The normal level of Green River at Wilson Bend is about 3 m. Three houses are located near the bank of the river along Wilson Bend. Their elevations are shown in Table 2.

Table 1
Water Level at Wilson Bend, Green River

Time	10:00 A.M.	11:00 A.M.	NOON	1:00 P.M.	2:00 P.M.	3:00 P.M.
Water Level (m)	3	3.1	3.4	4.0	5.0	5.2

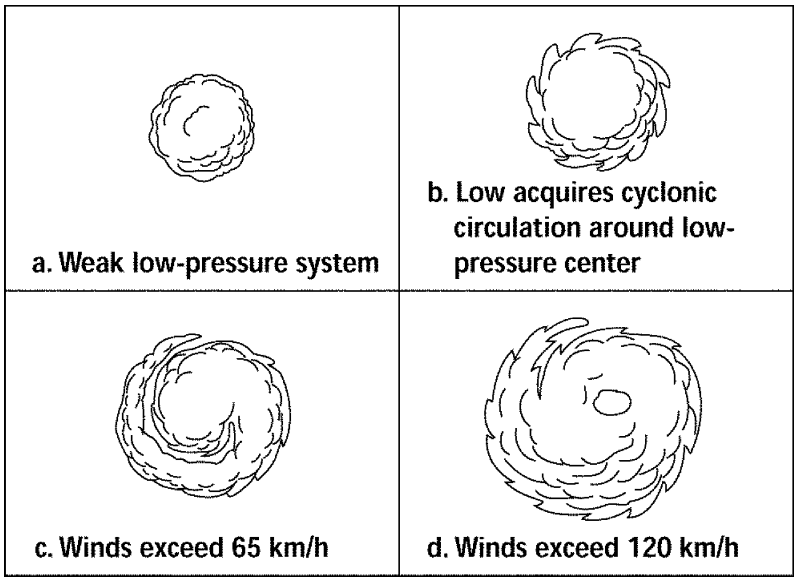
Table 2

House	Elevation (m)
X	8.0
Y	3.5
Z	4.0

21. Why is the accurate forecasting of storms such as this one important?

Problem

22. Label each illustrated stage in the development of a tropical cyclone (hurricane).



Storms Short Study Guide
Answer Section

MULTIPLE CHOICE

1. C
2. D
3. A
4. B
5. A
6. C
7. B
8. C
9. C

MATCHING

10. A
11. B

SHORT ANSWER

12. Frontal thunderstorms form when an advancing front pushes warm air rapidly up a steep cold-front boundary. The advancing front is usually a cold front.
13. Area C, the area immediately surrounding the eyewall, would produce the most wind damage. Winds become relatively weaker from the eyewall outward to the outer edge of the storm.
14. A drought is an extended period of below-normal rainfall. Droughts destroy crops and create food shortages. Droughts also increase the likelihood of forest fires.
15. Supercells and downdrafts are both characteristics of severe thunderstorms. Supercells are powerful storms characterized by intense, rotating updrafts. Updrafts transport moisture to the cool upper reaches of a cumulonimbus cloud, where the moisture condenses into cloud droplets. As these droplets fall, they cool the air around them. This cooled air then sinks, causing downdrafts that ultimately produce gusty surface winds. If these downdrafts become concentrated in a local area, they result in violent downdrafts called downbursts.
16. Both are major storms that swirl around areas of low pressure. Their high winds can cause great damage. A tornado is a whirling visible column of air in contact with the ground. A tropical cyclone is a larger, swirling system that forms over tropical oceans.
17. Occasionally, there is a continuous supply of surface moisture, so storms can continually regenerate themselves. Also, cold fronts, which cause some thunderstorms to form, are usually accompanied by upper-level, low-pressure systems with pools of cold air. This cold air can increase the temperature difference between the upper and lower parts of the storm, which increases the strength of updrafts and downdrafts, and makes the storm more severe.

18. Droughts are caused by large high-pressure systems that persist for a long time over continental areas. The sinking air in the systems prevents condensation from occurring. Heat waves are also caused by large high-pressure systems. Heat increases as the air under the system sinks and is warmed by compression, causing above-normal temperatures. The system blocks cooler air masses from moving into an area and also prevents condensation from occurring.
19. No, because conditions would not be right. Hurricanes form over warm ocean waters. The waters of the northern Atlantic would be too cold.
20. Air pressure has become lower, and the strength of the winds has increased, making the storm much stronger.
21. Accurate forecasting makes it possible to issue advanced warnings, and this is crucial in saving people from the hazards of flooding caused by storms.

PROBLEM

22. a. tropical disturbance
    b. tropical depression
    c. tropical storm
    d. hurricane