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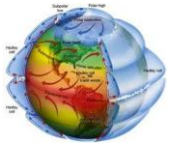
Weather Systems Study Guide:



1. Draw a diagram of Earth's **water cycle** and label each part.

2. Explain how the **water cycle** works.

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3. What happens in the troposphere and stratosphere?

Atmosphere Level	**What happens?**
Troposphere	
Stratosphere	

4. List 1 example of each kind of **heat transfer and explain how heat is transferred.**

	Examples	Explanations:
Radiation		
Convection		
Conduction		

5. What happens in **warm and cold front?**

Warm Fronts	**Cold Fronts**

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6. Illustrate how the **Jet Stream, Trade Winds, Polar Easterlies, and Prevailing Westerlies** work and where they can be found.

Jet Stream	**Trade Winds**
Prevailing Westerlies	**Polar Easterlies**

7. What **global wind systems** impact our weather in Raleigh, NC? **How**?

_____
_____
_____
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_____

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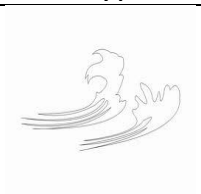
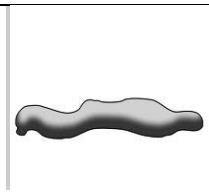
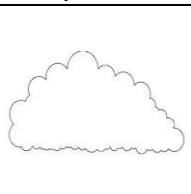
8. Identify the 4 main clouds. What level in the sky can they be found? What do they contain? What type of weather does each cloud produces?

Illustration				
Cloud Type				
Level				
Description				
Composition				
Type of Weather				

9. How does **altitude** affect **temperature**?

_____
_____
_____
_____
_____
_____
_____
_____

10. What temperature does **water** become a **solid**? _____ F 0° C

11. What temperature does **water** become a **gas**? _____ F 100° C

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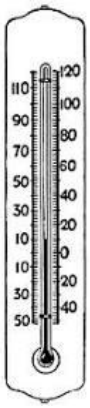
12. Match the **weather instrument** with what it measures.

.



_____ thermometer	A. humidity
_____barometer	B. wind speed
_____ wind vane(weathervane)	C. air pressure
_____ rain gauge	D. wind direction
_____ anemometer	E. temperature
_____hygrometer	F. amount of rainfall

13. Match the stage of the **water cycle** with its definition.

_____ evaporation	A. changing from a water vapor to liquid
_____condensation	B. excess water the ground cannot absorb
_____ precipitation	C. water evaporating from plant leaves
_____ collection	D. changing from liquid to water vapor
_____ runoff	E. when precipitation accumulates in a body of water
_____transpiration	F. form of water that falls from a cloud to Earth

14. What are 3 examples of **precipitation?**

15. Using your **data chart** of Raleigh, Sydney and Alert Bay, what can you infer about the relationship between latitude and temperatures?

_____
_____
_____
_____
_____
_____
_____
_____

38. Pretend yesterday was a warm summer day. At what time during the day was the temperature most likely at its **coldest**?

A. 9:00 pm
B. 12:00 noon
C. 5:00 am
D. 4:00 pm

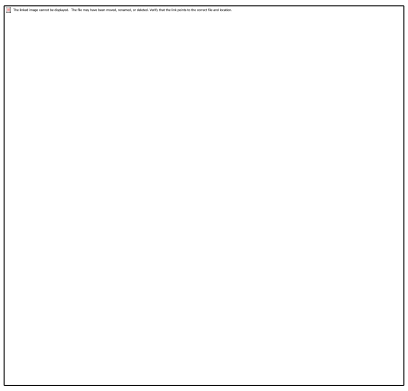
39. A barometer shows an **atmospheric pressure** of about 28.3 inches of mercury. Based on the readings of the barometer in the picture, what type of weather is *most likely* happening where the picture was taken?

A. The weather is changing.

B. The weather is fair.

C. The weather is stormy.

D. The weather is very dry.



40. The movement of air across the planet creates _____.

A. new species of animals.

B. new layers of atmosphere.

C. large bodies of water.

D. global weather patterns.

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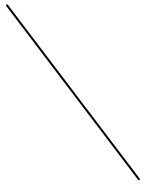
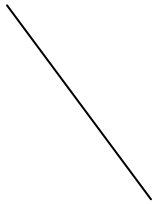
41. Weather Fronts: Describe the fronts and include what type of weather they bring and what type of conditions follow. Draw the shapes on the diagonal line.

Front	Describe	Weather it produces	Conditions that follow
Warm 			
Cold 			

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16. _____ weather

17. _____ climate

18. _____ meteorologist

19. _____atmosphere

20._____sea level

21._____ elevation

22._____latitude

23._____ longitude

24._____ local wind

25._____ global wind

26._____ jet stream

27._____ sea breeze

28._____ land breeze

29._____ Gulf Stream

30._____ Equatorial current

31._____ Humboldt Current

32._____ El Nino

33._____ La Nina

34._____ watch

35._____ warning

36. _____Rain Shadow Effect

37. _____Greenhouse Effect

****Match the word to its definition. Place letter on blank.**

a. unusual warming of the surface waters of the eastern tropical Pacific Ocean that causes changes in wind patterns
b. scientist who studies weather
c. height of a place above sea level
d. condition of the outside air at any time or place that is constantly changing
e. distance north or south of the Equator
f. weather of a particular area over a long period of time
g. unpredictable wind that moves across small distances close to Earth's surface
h. layer of gases surrounding a planet
i. air current in the upper atmosphere that has powerful influence over weather conditions and flows from west to east
j. convection current where air flows from sea to land during the daytime
k. level of the sea surface
l. conditions are favorable for a specific type of weather to occur
m. convection current where air flows from land to sea during the nighttime
n. distance west or east of the Prime Meridian
o. a specific type of weather is occurring right now
p. predictable and stable wind that moves great distances over the globe
q. heating of the Earth's atmosphere
r. widespread cooling of the surface waters of the eastern tropical Pacific Ocean
s. lack of precipitation on the leeward side of the mountain
t. warm swift current in the Atlantic Ocean that flows from the Gulf of Mexico along the eastern coast of the US
u. ocean current near the Equator that flows east-to-west

42. All of the following may affect our weather, EXCEPT:

A) the Sun
B) temperature
C) wind
D) meteorologist

Explain your answer: _____

_____

_____

43. The Earth has varied winds, rain, and weather conditions because of:

A) temperature
B) night air
C) the Sun
D) clouds

Explain your answer: _____

_____

_____

44. You live in Wake County, North Carolina. You may experience a decrease in temperature in each of the following scenarios, EXCEPT when:

A) Hiking in the Rocky Mountains
B) Relaxing on Wrightsville Beach in June
C) Going on a safari in central Africa
D) Visiting relatives in Alaska

Explain your answer: _____

_____

_____

45. At 6,684 feet above sea level and located in Burnsville, North Carolina, Mount Mitchell is the highest point east of the Mississippi River (in the USA). You and a friend decide to hike from the base to the peak! As you climb closer to the peak of the mountain, you notice the temperature...

A) Gets warmer because you are getting closer to the Sun
B) Gets cooler because air pressure decreases, and also you are farther up from the ground (sea level or zero elevation) where the land is reflecting heat from Sun rays
C) Gets warmer because heat rises, and air pressure increases
D) Gets cooler because you are closer to the peak, and many mountains and places of high elevation have snow

Explain your answer: _____

_____

_____

46. All of these statements about the *factors that drive weather* are true, EXCEPT:

A) The Sun radiates heat to the Earth's surface, causing uneven heating.
B) The Sun radiates heat to the Earth's surface, causing evaporation and the water cycle.
C) The Sun radiates heat to the Earth's surface, creating wind.
D) Convection currents transfer heat through water and wind, causing warm molecules to sink and cool molecules to rise.

Explain your answer: _____

_____

_____

47. As a meteorologist, you must know the properties of air masses in order to predict air mass movements in the daily weather forecast. Which of the following air mass descriptions is correct?

A) Hot Air Mass = less dense, light, rising, expanding, and spreading out
B) Hot Air Mass = more dense, light, rising, sinking, coming together
C) Cold Air Mass = more dense, heavy, sinking, contracting, coming together
D) Both A & B

Explain your answer: _____

_____

_____

48. Which statement is false?

A) High pressure blows toward low pressure, like when letting a balloon go.
B) Meteorologists don't worry about air pressure, because it's the last thing they need to know to forecast weather.
C) High pressure means that cool air is sinking, pressing down more air into the columns of air. High pressure systems have fair, stable weather.
D) Low pressure means that warm air is rising, and cool air is blowing in to replace it. Low pressure systems have changing, unstable weather.

Explain your answer: _____

_____

_____

49. Which of the following most represents a weather system?

A) temperature, wind speed, precipitation, air pressure
B) air pressure, wind direction, Fahrenheit, gravity
C) wind speed, rain, rain gauge, warm front
D) pencil, graph paper, ruler, weather data

Explain your answer: _____

_____

_____

50. Weather patterns and trends are helpful, because:

A) We can memorize patterns easily.
B) They help us measure the daily climate.
C) We can look at compiled weather data from the past to forecast weather in the future.
D) We can call our friends and decide what to wear to school tomorrow.

Explain your answer: _____

_____

_____

51. A handle on a pot is going to get hot as the pot and the water are heated on the stove. This is because:

a. the heat moves only through the air to the handle
b. the heat moves through the metal of the pot to its metal handle
c. the heat travels through the water, into the air and then into the handle
d. the heat radiates from the gas burner into the handle

Explain your answer: _____

_____

_____

52. The temperatures in Wilmington, NC, tend to be mild, even during the winter months. This is most likely due to:

A. the Jet Stream
B. La Nina
C. the Gulf Stream
D. the trade winds

Explain your answer: _____

_____

_____

53. Given these conditions - dark, cloudy skies, barometer (air pressure) falling, temperatures in the 60s falling to 50s, high humidity - which weather would most likely be predicted? Explain your rationale.

A. blizzard
B. heat wave
C. rain storm
D. ice storm

Explain your answer: _____

_____

_____