

Name: _____

Date: _____ Period: _____

Water and Climate

Earth Science

Water and Climate

Practice Test

Directions: For questions 1-25 record your answers on the scantron provided. Some questions may require the use of the 2011 Edition Reference Tables for Physical Setting/Earth Science.

1) Which processes of the water cycle return water vapor directly to the atmosphere?

- | | |
|----------------------------------|---------------------------------|
| 1) evaporation and transpiration | 2) infiltration and capillarity |
| 3) freezing and precipitation | 4) water retention and runoff |

2) Which processes are most likely to cause a rise in the water table?

- | | | | |
|-----------------------|------------------------------------|--------------------------|-----------------------------------|
| 1) runoff and erosion | 2) solidification and condensation | 3) deposition and burial | 4) precipitation and infiltration |
|-----------------------|------------------------------------|--------------------------|-----------------------------------|

3) During a rainstorm, when soil becomes saturated, the amount of infiltration

- | | |
|-----------------------------------|-----------------------------------|
| 1) increases and runoff decreases | 2) decreases and runoff increases |
| 3) decreases and runoff decreases | 4) increases and runoff increases |

4) The least amount of surface water runoff will occur when soil pore spaces are

- | | |
|--|--------------------------------------|
| 1) unsaturated and the slope is steep | 2) saturated and the slope is steep |
| 3) unsaturated and the slope is gentle | 4) saturated and the slope is gentle |

5) A paved blacktop parking lot was built on what was once a soil-covered field. This area will now experience increased runoff when rain occurs because the paved parking lot has

- | | | | |
|---------------------|----------------------|---------------------|-------------------------|
| 1) greater porosity | 2) less permeability | 3) less capillarity | 4) greater infiltration |
|---------------------|----------------------|---------------------|-------------------------|

6) In which planetary wind belt do most storms move toward the northeast?

- | | | | |
|---------------|---------------|-----------------|-----------------|
| 1) 0° to 30°N | 2) 0° to 30°S | 3) 30°N to 60°N | 4) 30°S to 60°S |
|---------------|---------------|-----------------|-----------------|

7) Which ocean current warms the climate of northwestern Europe?

- | | | | |
|---------------------|-----------------------------|-------------------|---------------------------|
| 1) Labrador Current | 2) North Equatorial Current | 3) Canary Current | 4) North Atlantic Current |
|---------------------|-----------------------------|-------------------|---------------------------|

8) The Gulf Stream and North Atlantic Current modify the climate of northwestern Europe by making the climate

- | | | | |
|--------------------------|---------------------|--------------------------|---------------------|
| 1) warmer and more humid | 2) warmer and drier | 3) cooler and more humid | 4) cooler and drier |
|--------------------------|---------------------|--------------------------|---------------------|

9) A city located on the coast of North America has warmer winters and cooler summers than a city at the same elevation and latitude located near the center of North America. Which statement best explains the difference between the cities climates?

- 1) Wind speeds are usually greater over land surfaces than over ocean surfaces.
- 2) Ocean surfaces change temperature more slowly than land surfaces.
- 3) Warm, moist air rises when it meets cool, dry air.
- 4) Ocean surfaces have a lower specific heat than land surfaces.

10) Which natural event temporarily slows or reverses surface ocean currents in the equatorial region of the Pacific Ocean, causing a disruption of normal weather patterns?

- 1) volcanic eruptions
- 2) El Niño
- 3) monsoons
- 4) deforestation

11) Which climate condition generally results from both an increase in distance from the equator and an increase in elevation above sea level?

- 1) cooler temperatures
- 2) warmer prevailing winds
- 3) increased precipitation
- 4) increased air pressure

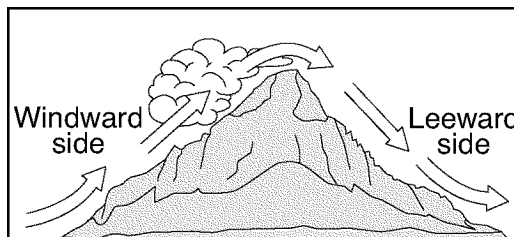
12) Near which two latitudes are most of Earth's dry climate regions found?

- 1) 0° and 60°N
- 2) 30°N and 60°N
- 3) 0° and 30°S
- 4) 30°N and 30°S

13) What is the primary source of energy for Earth's weather systems?

- 1) subtropical jet streams
- 2) precipitation from clouds
- 3) incoming solar radiation
- 4) heat from Earth's interior

14) The diagram below shows air movement over a mountain.



Compared to the climate on the windward side of the mountain, the climate on the leeward side of the mountain is

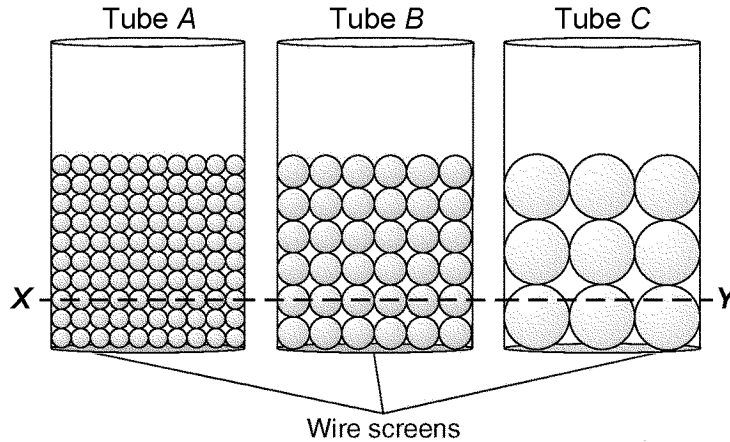
- 1) drier and warmer
- 2) more humid and cooler
- 3) drier and cooler
- 4) more humid and warmer

15) According to the Earth Science Reference Tables, the climate of which location in New York State is influenced *least* by large bodies of water?

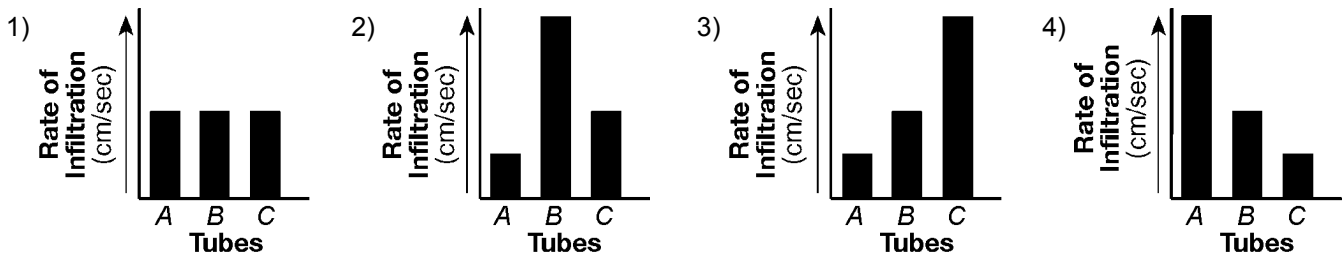
- 1) Buffalo 2) New York City 3) Jamestown 4) Binghamton

Questions 16 and 17 refer to the following:

The diagram below represents three tubes, A, B, and C, each containing an equal volume of uniform-sized spherical beads. The bottom of each tube is covered with a wire screen. XY is a reference line.



16) Which one of the following bar graphs would best represent the rate of water infiltration through tubes A, B, and C in the diagram shown?



17) The tubes in the given diagram are placed in water up to the level of line XY to demonstrate capillarity. After one hour, the height of the water above line XY will be

- 1) the same height in all three tubes 2) highest in tube A 3) highest in tube B 4) highest in tube C

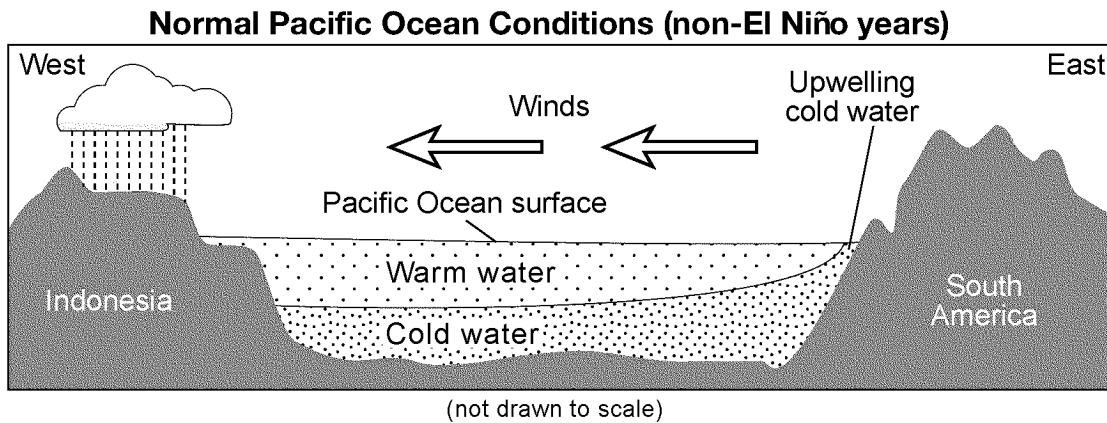
Questions 22 through 25 refer to the following:

The cross section below represents a generalized region of the Pacific Ocean along the equator during normal (non-El Niño) conditions. The relative temperatures of the ocean water and the prevailing wind direction are indicated.

EL NIÑO

Under normal Pacific Ocean conditions, strong winds blow from east to west along the equator. Surface ocean water piles up on the western part of the Pacific due to these winds. This allows deeper, colder ocean water on the eastern rim of the Pacific to be pulled up (upwelling) to replace the warmer surface water that was pushed westward.

During an El Niño event, these westward-blowing winds get weaker. As a result, warmer water does not get pushed westward as much, and colder water in the east is not pulled toward the surface. This creates warmer surface ocean water temperatures in the east, allowing the thunderstorms that normally occur at the equator in the western Pacific to move eastward. A strong El Niño is often associated with wet winters along the northwestern coast of South America and in the southeastern United States, and drier weather patterns in Southeast Asia (Indonesia) and Australia. The northeastern United States usually has warmer and drier winters in an El Niño year.





22) Which statement best describes the planetary wind belts that produce the winds represented in the cross section shown?

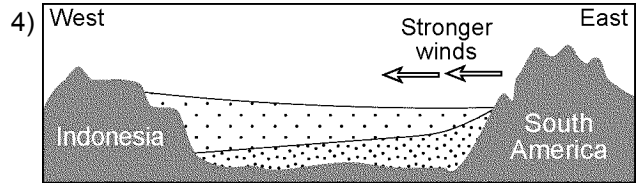
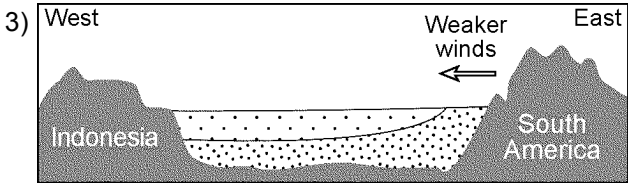
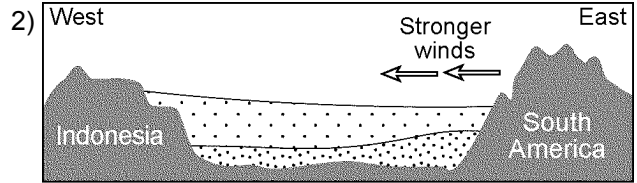
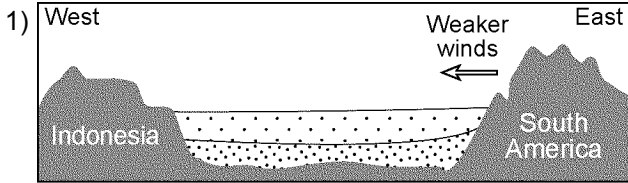
- 1) Northeast and southeast winds converge at the equator and blow toward the east.
- 2) Southwest and northwest winds diverge at the equator and blow toward the east.
- 3) Southwest and northwest winds diverge at the equator and blow toward the west.
- 4) Northeast and southeast winds converge at the equator and blow toward the west.

23) Compared to non-El Niño years, which climatic conditions exist near the equator on the western and eastern sides of the Pacific Ocean during an El Niño event?

- 1) The western Pacific is wetter and the eastern Pacific is drier.
- 2) The western and the eastern Pacific are both drier.
- 3) The western Pacific is drier and the eastern Pacific is wetter.
- 4) The western and the eastern Pacific are both wetter.

24) Which cross section best represents the changed wind conditions and Pacific Ocean temperatures during an El Niño event? [Diagrams are not drawn to scale.]

KEY:	
	Warm water
	Cold water



25) During an El Niño year, winter climatic conditions in New York State will most likely be

- 1) warmer and drier 2) colder and wetter 3) warmer and wetter 4) colder and drier