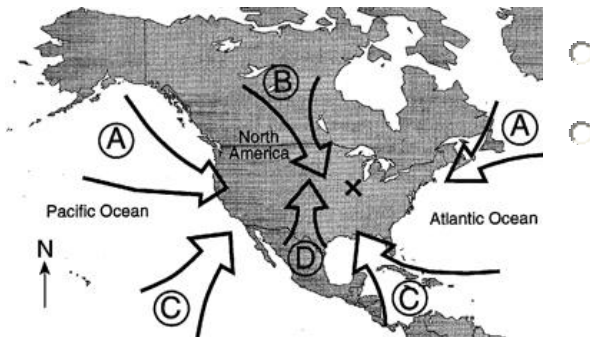


Pretest 4.3

1. Which of the following is true with respect to air masses B and C on the map?



- (A) Air mass B is cold polar and air mass C is maritime polar.
(B) Air mass B is cold polar and air mass C is maritime tropical.
 (C) Air mass B is cold arctic and air mass C is maritime tropical.
 (D) Air mass B is cold arctic and air mass C is maritime polar.

2. An air mass from the North Pacific Ocean that moves south over Vancouver, British Columbia, would likely be labeled as which of the following?

- (A) Maritime tropical
(B) Maritime polar
 (C) Continental polar
 (D) Continental tropical

3. Which of the following statements is true regarding wind direction, given the following chart that records air pressure readings for Vancouver and Victoria?

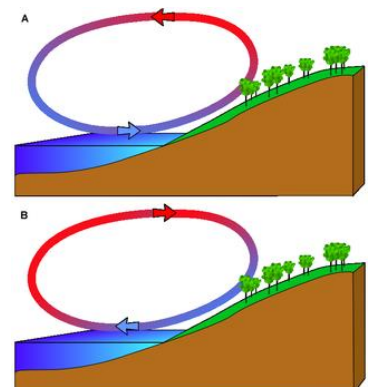
	Air Pressure (mb)	
Day	Vancouver	Victoria
1	1004.0	1004.0
2	1000.1	1002.9
3	1000.5	1011.1
4	1009.0	1012.0

(mb) = millibars Hg= pressure unit

- (A) The wind is blowing from Vancouver to Victoria and the wind is strongest on day 1.
 (B) The wind is blowing from Vancouver to Victoria and the wind is strongest on day 2.
 (C) The wind is blowing from Victoria to Vancouver and the wind is strongest on day 4.
(D) The wind is blowing from Victoria to Vancouver and the wind is strongest on day 3.
(it has the largest pressure difference)

4. Which of the following best describes why offshore breezes develop on the seashore after sunset?

- (A) Ocean remains warmer at night. Then warm air moves towards land, generating onshore breezes.
 (B) Rapid cooling of water at night generates offshore breezes.
(C) Land cools rapidly at night and cool air can push below the ocean's warm rising air. This generates offshore breezes. Explained by diagram B
 (D) Land remains warmer at night, generating offshore breezes.

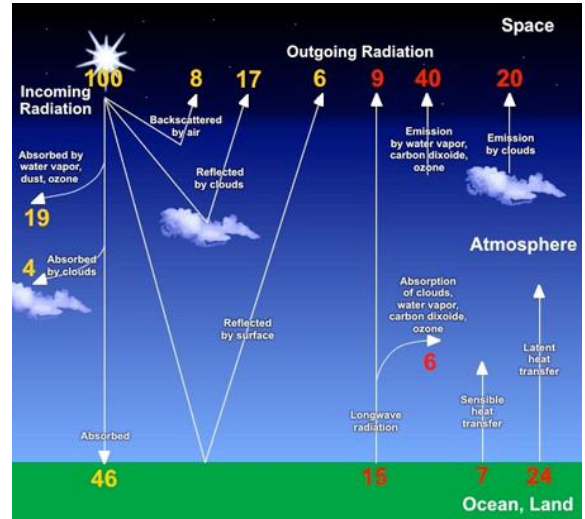


5. Examine the diagrams in #4 again. Which diagram would apply to a daytime sea breeze when the land heats more rapidly than the sea? A

6. What happens to most of the solar radiation that enters the Earth's atmosphere?

(A) It is absorbed at the Earth's surface.
It then turns into heat and greenhouse gases absorb some of that

- (B) It is reflected by the surface of the Earth.
- (C) It is absorbed by clouds.
- (D) It is reflected by clouds.



7. Which two atmospheric gases are thought to increase global warming by absorbing heat from the atmosphere?

- (A) Carbon dioxide and methane
- (B) Hydrogen and helium
- (C) Oxygen and nitrogen
- (D) Chlorine and argon

8. Which greenhouse gas is more powerful than all others but is not considered a pollutant because whatever we add is only a small fraction of what's naturally in the atmosphere? H₂O

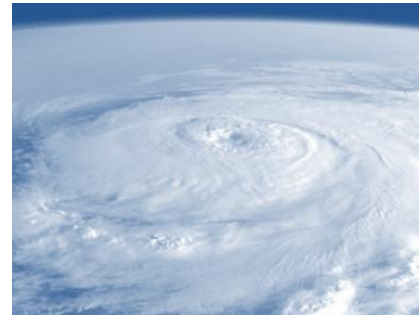
9. Which atmospheric gas is consumed whenever we produce carbon dioxide but we don't worry about it because we only consume a very tiny fraction of what is naturally available? O₂

10. What term is given to a large atmospheric expanse with consistent temperature and humidity?

- (A) prevailing winds
- (B) air mass
- (C) depression (low pressure system)
- (D) anticyclones

11. Which type of air mass supplies the moisture and produces the excessive winds that characterize hurricanes?

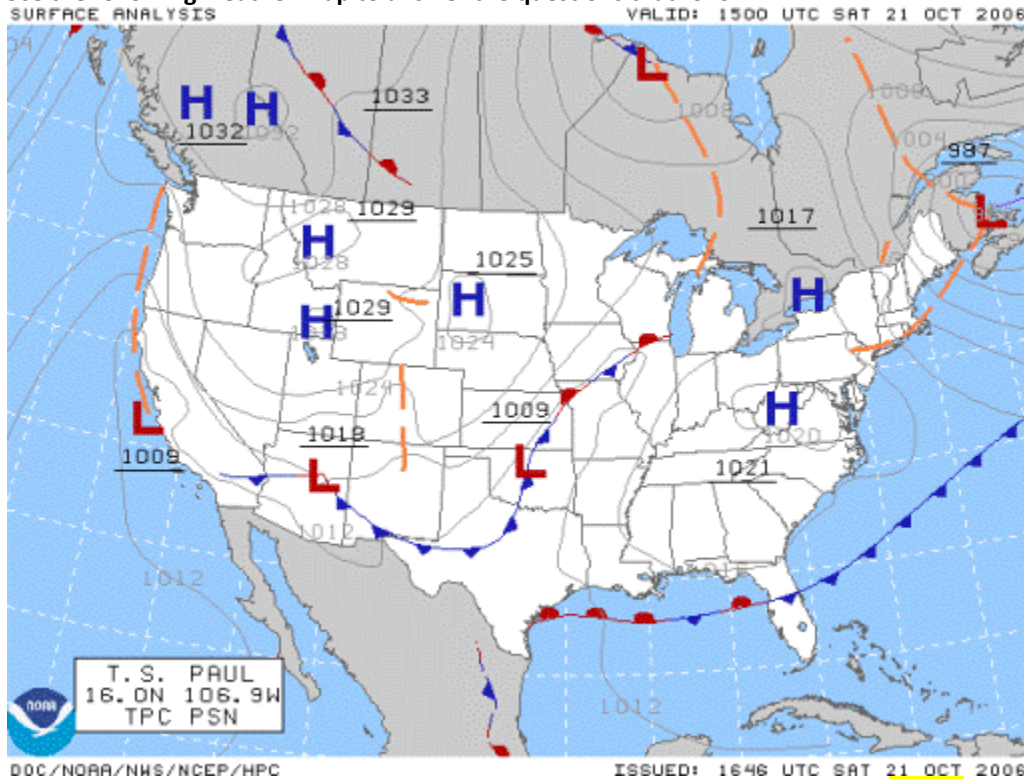
- (A) Continental polar
- (B) Maritime polar
- (C) Maritime tropical
- (D) Continental tropical



12. Fill in the blanks: In the northern hemisphere, an anticyclone is a high pressure system in which the air moves in a clockwise direction.

13. Anticyclones are typically associated with cloudy conditions and precipitation. True? or False?

14. Use the following weather map to answer the questions that follow:

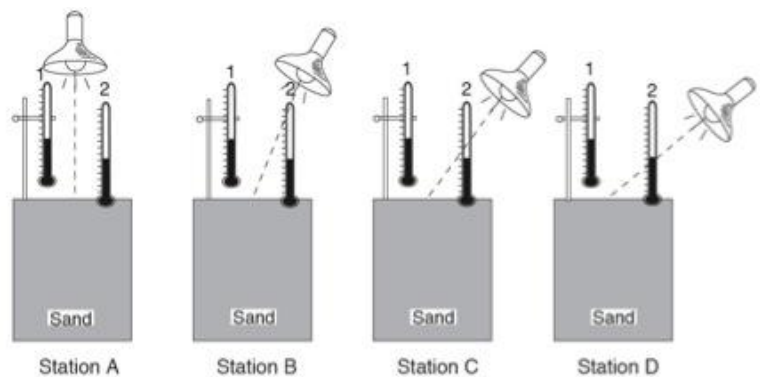


- How many anticlockwise pressure systems are represented on the weather map? **5 Lows**
- What kind of front is Texas experiencing as cold air moved in? **cold**
- What kind of front is Alberta experiencing as a cold front invaded a warm front? **occluded**
- Is it sunny in British Columbia? **yes (high pressure)**

15. A one-megawatt wind turbine can produce enough electricity for approximately 200 families. Which of the following is NOT a benefit of wind energy?

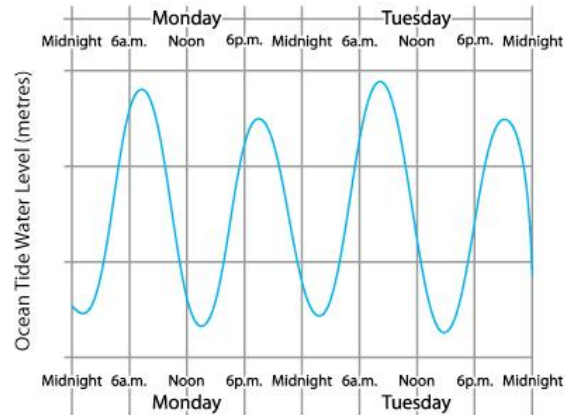
- Wind turbines do not produce greenhouse gases.
- Wind energy creates additional revenue for farmers who lease their land.
- Wind energy can be stored for peak periods of energy consumption.**
- Wind energy is a renewable resource.

16. Which station receives the most intense radiation from the lamp? This is related to why the equator receives the most radiation from the sun?



A

17. a) On the diagram indicate when the two high tides occur on Monday.
After 6 AM and after 6 pm
- b) On the diagram indicate when the two low tides occur on Monday.
After midnight and 12PM
- c) Why does it take more than 24 hours for the tide cycle to repeat?
The moon revolves around the earth-moon center of mass while the Earth turns on its axis.
- d) What is the strongest force involved in pulling on the oceans in causing tides?
Moon's gravity

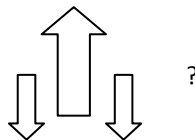


18. If the moon were to increase its distance from the Earth, then which of the following best describes how the tides would respond?
- (A) Both high and low tides would get higher.
(B) High tides would get lower and low tides would get higher.
 (C) High tides would get higher and low tides would get lower.
 (D) Both high and low tides would get lower

19. Which of the following is **not** a thermoplastic?
- (A) polyethylene
 (B) polypropylene
 (C) polystyrene
(D) melamine

20. Which twisting constraint is experienced by buildings during earthquakes?
- (A) Shearing
(B) Torsion
 (C) Tension
 (D) Compression

21. What constraint is symbolized by



deflection

22. List two elements with an atomic number less than 4 that have poor thermal conductivity.
He and H
23. What third period material has decent electrical conductivity but lousy thermal conductivity?
Si
24. All ceramic materials contain oxides that include Al_2O_3 . What charge does aluminum have? Show why using simple algebra. (STE)
 $2Al + 3(-2) = 0$.
 $2Al = 6$

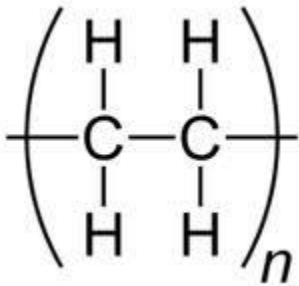
AI = 3

25. Complete the table revealing the composition and uses of composite materials.

Composite	Matrix material	Reinforcing material	Uses
wood			House construction; furniture; floors
Carbon fiber		Carbon fiber	
Plastic- fiberglass		fiberglass	

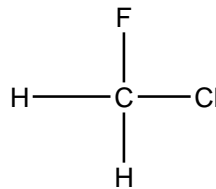
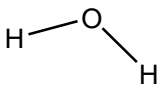
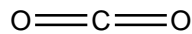
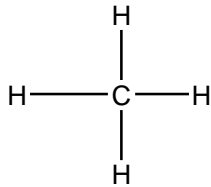
26. Explain what is meant by a monomer in the context of plastics?

A monomer is the repeating link in the molecular chain that is called a plastic.



In this case (polyethylene) the monomer is C_2H_4

27. Draw a dot structure for 4 different greenhouse gases. (STE)



28. Do the center of mass calculation used to explain why the earth-moon center of mass is 1700 km below the Earth's surface. (STE)

$$X_1 + X_2 = 384\,400 \text{ km; radius of earth} = 6378 \text{ km}$$

$$\text{mass of earth} = 81.17 \times \text{mass of moon}$$

$$M_e X_1 = M_m X_2$$

$$81.17 M_m X_1 = M_m X_2$$

$$81.17 x_1 = x_2$$

$$81.17 x_1 = (384\,400 - X_1)$$

$$x_1 = 4678 \text{ km or } 6378 \text{ km} - 4678 = 1700 \text{ km below surface}$$

