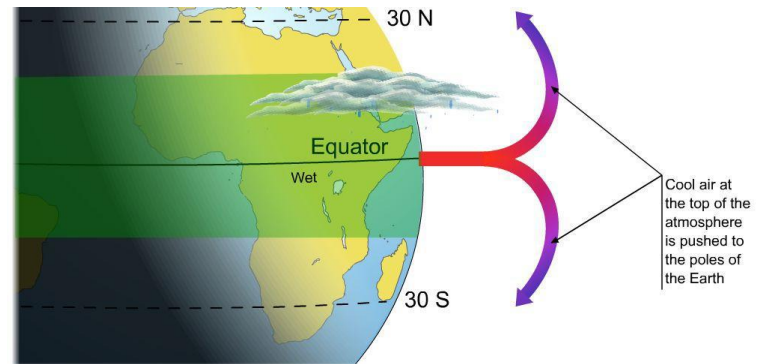
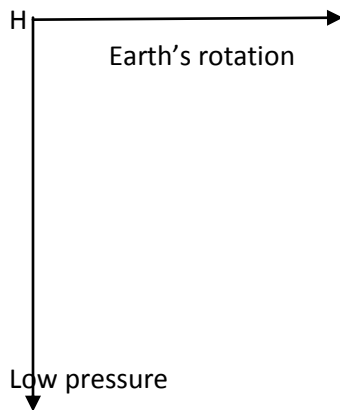


## ST Pretest 2.2

1. Use the diagram to explain why the Hadley cell exists.

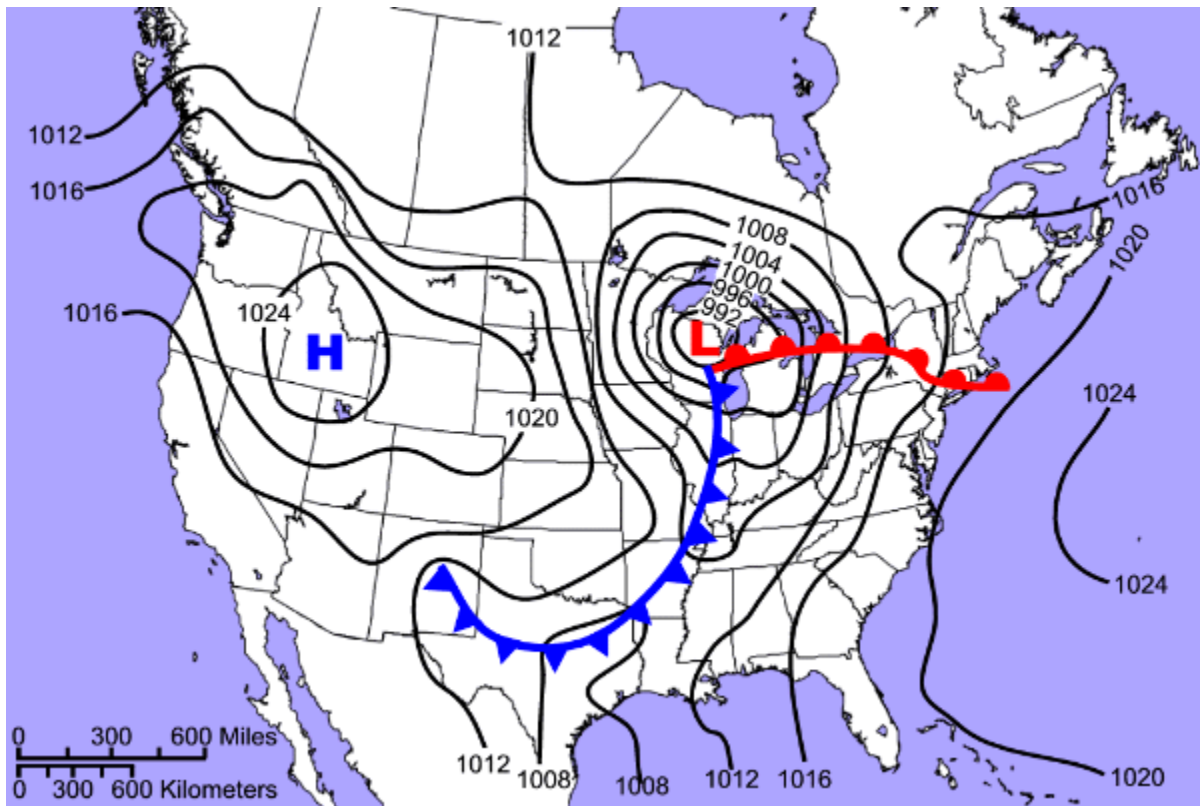


2. a) Predict the resulting direction of the wind



3.
  - a) What is the most powerful greenhouse gas?
  - b) Which fossil fuel derived greenhouse gas has become a major pollutant?
  - c) How can carbon dioxide be filtered?
  - d) When you compare a greenhouse to the actual atmosphere, why is glass like the greenhouse gases?

4.



- Idaho is having the most beautiful weather today. Locate Idaho based on the weather map, not on your knowledge of US geography.
- Which Canadian province is having the rainiest weather. Why?
- What large American state is experiencing thunderstorms?
- If there is a large warm air mass south of the 1008 isobar, what is on the other side of the triangular boundary?
- What kind of rain and clouds would you see along the triangular boundary?
- Which moves faster? A warm front? Or a cold front?
- In which direction do the winds of a low pressure system in North America blow?
- Which provinces are closest to the Maritime polar air mass?

5. a) What kind of plants have nitrogen-fixing nodules in their roots?

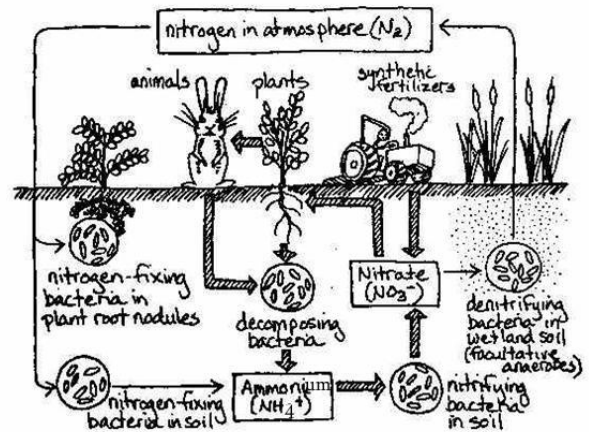
b) Why can't plants use the nitrogen directly from the air?

c) What is the role of denitrifying bacteria?

d) How is the rabbit contributing to the N-cycle?

e) Explain runoff.

**The Nitrogen Cycle**



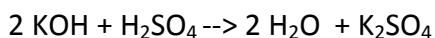
6. Flashback.

Complete the table.

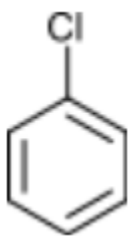
Element	Chemical Symbol	Atomic Number	Number of Protons	Number of electrons in neutral atom	
nitrogen					Charge, if you add 3 electrons=
sulfur					Charge, if you add 2 electrons=
sodium					Charge, if you remove 1 electron=
hydrogen					Charge, if you remove 1 electron=

## Pretest 2.2 STE PART

1. What is the concentration of a solution consisting of 5.85 grams of sodium chloride dissolved in 100.0 ml of solution?
2. What volume of 0.50M  $\text{KOH}_{(\text{aq})}$  will react with 200 ml of a 3.0 moles/L solution of  $\text{H}_2\text{SO}_4$ ?



3. How much water has to be added to a 20.0 ml solution of 0.10 M KBr in order to create a 0.010 M solution?
4. When do we use the PTA technique instead of the WDTA?

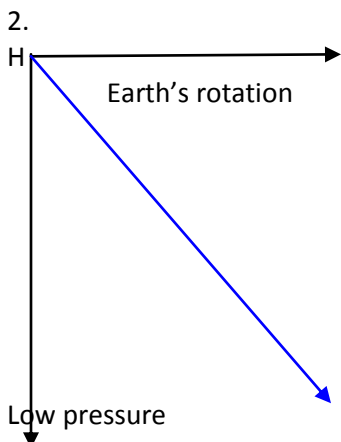


5. This is a skeleton structure of  $\text{C}_6\text{H}_5\text{Cl}$ . Use it a guideline to draw a Lewis structure.

6. In a nuclear reaction, is it possible for
  - a) Mass not to be conserved?
  - b) For neutrons to turn into protons and beta particles?
  - c) For protons to capture beta particles?
  - d) For gamma rays to be absorbed?
  - e) For neutrons to be absorbed by the nucleus?

## ST ANSWERS

1. Areas closer to the equator receive more direct sunlight. This warms the air. As its density decreases it rises. Cooling causes condensation and then close to the 30° latitude, drier air sinks .



3. a) water  
b) carbon dioxide  
c) Use a substance like rock or sodium hydroxide that can react with carbon dioxide.  
d) They are both transparent to visible light and both can absorb infrared= heat (not let it out )
4. a) It's in the West, where the H is (high pressure center)  
b) Ontario. It's closest to the low pressure system and the associated cold and warm fronts.  
c) Texas  
d) a **moving** cold air mass. In a cold front, the cold mass moves towards warm air. In a warm front the opposite is true.  
e) Thunderstorms  
f) A cold front moves faster.  
g) Clockwise  
h) Maritimes: Newfoundland, Nova Scotia, P.E.I., New Brunswick
5. a) **legumes**  
b) **Not reactive enough**  
c) **Return nitrogen to the air**  
d) **its urine and wastes have nitrogen-containing wastes**  
e) **If there's too much nitrogen in the soil, it gets washed away and it pollutes lakes and rivers**

## Flashback

Complete the following table:

Element	Chemical Symbol	Atomic Number	Number of Protons	Number of electrons in neutral atom
nitrogen	N	7	7	Charge, if you add 3 electrons=-3
sulfur	S	16	16	Charge, if you add 2 electrons=-2
sodium	Na	11	11	Charge, if you remove 1 electron=+1
hydrogen	H	1	1	Charge, if you remove 1 electron=+1

## ANSWERS to STE

1.  $5.85 \text{ g}/(58.5 \text{ g/mole}) = 0.10 \text{ moles NaCl}$

$$C = n/V = 0.10/(100/1000) = 1.0 \text{ mole/L}$$

2.  $n = CV$  for acid

$$0.200\text{L} * 3.0 \text{ mol/L} = 0.6 \text{ mol H}_2\text{SO}_4$$

$$0.6 \text{ mol H}_2\text{SO}_4 (2 \text{ KOH/ H}_2\text{SO}_4) = 1.2 \text{ mole KOH}$$

$$n = CV \text{ for base}$$

$$1.2 \text{ mole KOH} = 0.50 \text{ mole/L (V)}$$

$$V = 1.2/0.50 = 2.4 \text{ L}$$

3.  $C_1V_1 = C_2V_2$

$$0.10(0.020) = 0.010 V_2$$

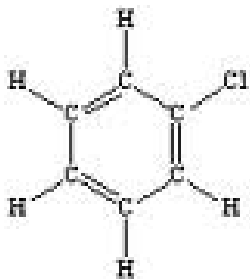
$$V_2 = 0.200 \text{ L} = 200 \text{ ml}$$

So you have to add  $200 \text{ ml} - 20 \text{ ml} = 180 \text{ ml}$  of water.

4. PTA is for dilution of a an already prepared aqueous solution.

WDTA is for preparing an aqueous solution starting with a solid solute.

5.



6. yes to all!

