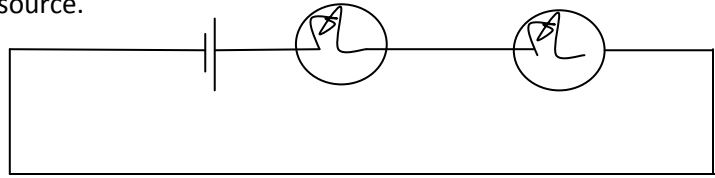
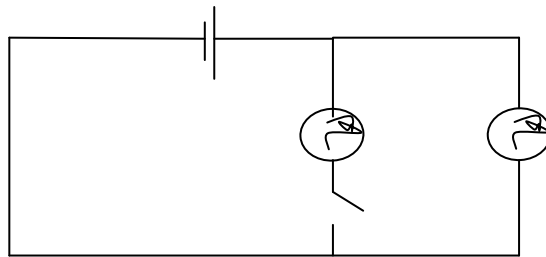


ST Review 2

1. A) Draw a circuit with two light bulbs and one power source. Use the appropriate symbols for the light bulb and power source.



- B) Place a switch in the circuit which will allow you to turn one bulb off while allowing the other one to remain turned on.



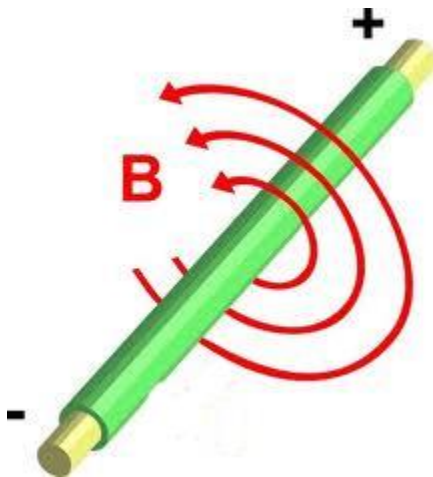
- c) If the resistance of the bulbs is $10\ \Omega$ in all, how much current flows through the $3.0\ \text{V}$ battery?

$$V = IR$$

$$3 = I(10)$$

$$I = 3/10 = 0.3\ \text{A}$$

2. Draw the direction of a magnetic field around an electrically conducting wire. Assume that the (-) end of the wire is on the left hand side.



3. In which type of biome is Montreal found in?

- A. Tundra
B. Temperate forest
C. Boreal forest
D. Grasslands

4. In #3, list the differences between the 4 biomes mentioned among the choices.

tundra: low precipitation, cold ; no trees; lichen

temperate forest: mostly deciduous trees, four seasons

boreal forest: colder and drier than temperate forest; mostly evergreen trees

grasslands: dry summers; no trees; mostly grasses

5. Below is the high-tide schedule for the Bay of Fundy on June 1, 2008:

10:30 a.m.: height of 12.1 m	10:53 p.m.: height of 12.9 m
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a) What causes tides? (1 mark)

The moon's gravitational pull, mostly

b) Why are there two high tides a day? (1 mark)

There is one bulge facing the moon and one on the other side of the earth, in a direct line with the moon

6. An air mass that originated in the Caribbean now lies over Québec, while a fast-moving air mass from the far north is heading down toward the southern part of the province.

Explain what happens when these two air masses meet. In your explanation, discuss the various phenomena involved.

A cold front will result. You will get thunderstorms formed from warm, moist air that will rise over a narrow area and condense. Strong winds can then form from the lowering of air pressure.

7. What is the greenhouse effect? Explain how it works. Recall: do **NOT** mention the ozone hole!

Certain gases like carbon dioxide, water vapour and methane are transparent to visible light. This allows the earth to be warmed up as visible light gets turned into heat radiation when land and other objects absorb light. When this heat tries to escape from the earth's surface, some of it is absorbed by the greenhouse gases: CO₂, CH₄ etc) . This warms the atmosphere. When the layer of gases is too thick, due to man-made emissions, the warming effect increases.

8. If 0.02 g of salt were dissolved in 10.0 ml of water.
express the concentration of the solution in
(a) ppm and

$$0.02 \text{ g (1000 mg/g)} = 20 \text{ mg}$$

$$10.0 \text{ ml (L/1000 ml)} = 0.010 \text{ L}$$

$$\text{ppm} = \text{mg/L} = 20 \text{ mg} / 0.010 \text{ L} = 2000 \text{ ppm}$$

(b) in (% m/v) = in terms of mass of solute per volume of solution

since 1 ml of water = 1 g, use g/ml for %:

$$(0.02\text{g} / 10.0 \text{ ml}) * 100\% = 0.2 \%$$

9. In the carbon cycle, explain how the carbon in CO_2 can end up in the lithosphere and hydrosphere, and explain how it returns to the atmosphere.
- It can end up in the lithosphere by dissolving in rainwater, and the H_2CO_3 can react with minerals in the soil to produce carbonates. (part of sedimentary rock)
 - It can also be absorbed by plankton in the ocean, and their ocean sediments can trap carbon in the lithosphere. Some stays in the ocean's waters, so it becomes part of the hydrosphere.
 - Volcanic action can return carbon dioxide to the atmosphere. Animal respiration can also return carbon dioxide to the atmosphere since any sugars broken down by respiration will form water and carbon dioxide.
10. If you could track a nitrogen atom from the atmosphere, explain all the steps of its journey as it ends up in plants, animals and soil before returning to the air.
- 1) Nitrogen fixation by bacteria can convert nitrogen gas into nitrates that plants can use to make protein, DNA etc.
 - 2) Decomposition can turn animal waste into ammonia that plants can use (technically they absorb ammonium ion, but don't worry about this).
 - 3) Nitrates can turn into nitrites (nitrification), and then....
 - 4) Nitrites can then return to the atmosphere if bacteria denitrify them back into nitrogen gas.