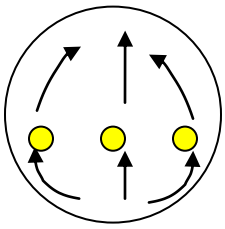
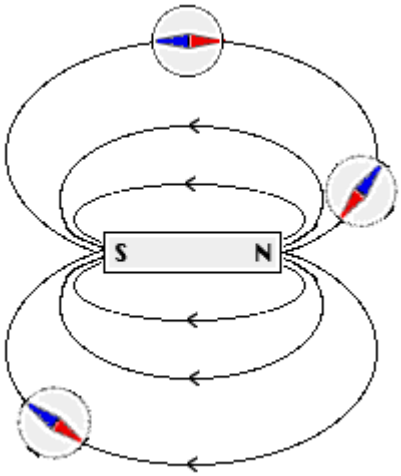
1. Which of the following materials form domains?

   a. plastic__no_
   b. silver(Ag)__ no_
   c. copper(Cu)__ no_
   d. cobalt(Co)__yes
   e. neodymium(Nd)_ yes

2. What will happen to a ferromagnetic material like nickel if it comes into contact with a temporary magnet?
   It will stick to it.

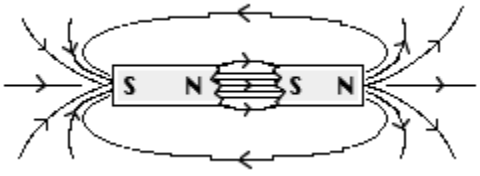
3. Draw the domains within a permanent spherical magnet.





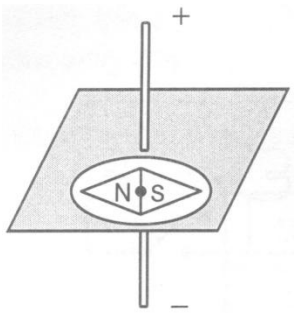
4. a. In the diagram to the right, are the magnetic field lines drawn correctly? yes
   b. Label the North end of each compass needle. North is blue
   c. Modify the diagram so that it represents a stronger magnet. Add more lines

5. a. In the diagram below, can you predict whether the 2 magnets are attracting? Yes they are. Look at N and S in the middle.



b. Are the magnetic field lines correctly represented in between the two opposite poles? Yes

6. Why does the compass point to the left?



Apply the left hand rule. Have your thumb point up because the electricity is flowing straight(like your thumb) from (-) to (+). Notice that the rest of yur fingers point left. This is the direction of the magnetic field in front of the wire. The field is caused by the moving electrons.

7.

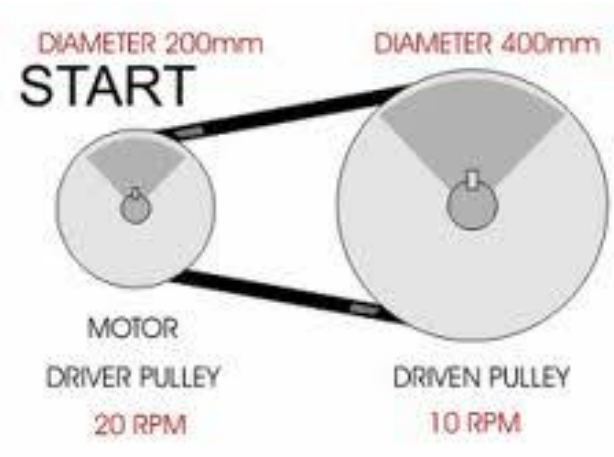
a) If we turn the small gear so that it make 34 turns, how many turns will the large gear complete?

Velocity ratio = in/out = 11/17, so the larger wheel only turns $11/17^{th}$ times as fast.
34 turns (11/17) = 22 turns.

b) How much more turning force(find the mechanical advantage) does the large gear have?

17/11

8. a)What makes this system different from a chain-sprocket system? Give two differences.



Belt instead of chain
Groove instead of teeth on gears

c) Calculate the speed (velocity ratio)of this system.

V = I/O = 200/400 = 0.5

9. You want the motor to spin a certain gear very quickly, but you want the other gear that's attached to the 1st one to move very slowly.

What kind of gear system will work best? Worm-worm-gear

10. A machine requires no toothed gears, and you don't want any belts either. What kind of gear system can be used?

Friction gears

Flashback

11. The population density of France is 108 people per km^2. France has about 62 000 000 people. What is the size of France?

62 000 000 people(km^2/108 people) = 574 074km^2

About 570 000 km^2

12. Briefly explain why molten sodium chloride conducts electricity.

Molten sodium chloride contains Na^+ which will accept electrons (opposite charges attract) from the battery or power source. Since electrons are leaving the power source,

the source will also have a positive end. Cl^- will lose electrons to the positive end. As long as there are electrons to be absorbed and lost, the molten sodium will continue to conduct electricity.

13. Draw a Bohr-Rutherford diagram for ^{12}C.

^{12}C