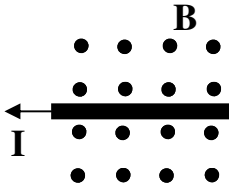
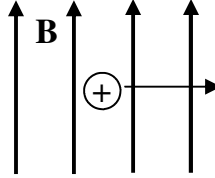


2009-10 Magnetism In Class Review 1

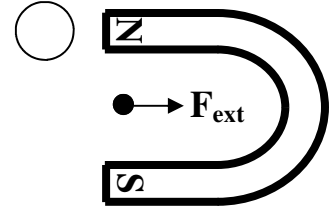
1. A current carrying wire is placed into a magnetic field. Which direction will the wire deflect?



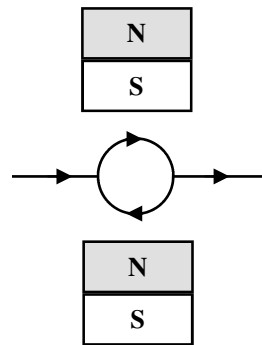
2. A. Find the direction of the magnetic force on the charge.
 B. What if it was an electron?
 C. What if the charge was stationary?



3. A wire is pushed between the poles of a horseshoe magnet. Find the direction of the induced current and compass.

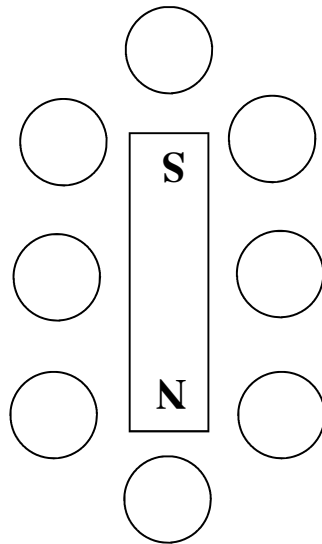


4. A. Above wire 1, which direction does B_1 point?
 B. Will the two wires attract or repel each other?
 C. Prove it.

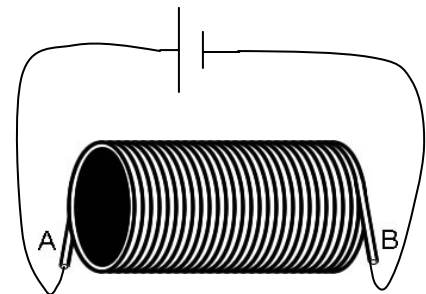


5. A. If the arrows show the direction of current flowing in the wire loop, which direction is north: into or out of the page?
 B. Which way will the loop turn?
 C. This is the simplest example of what?

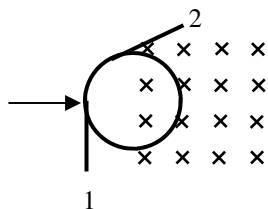
6. A. Fill in the compass arrows.
 B. Compasses always point away from what?
 C. Underneath the earth's north pole is what pole of the earth's internal magnet?



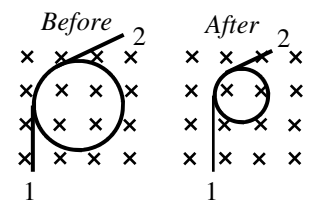
7. A. Draw the direction of current flowing from the battery.
 B. Which side of the solenoid will be N?
 C. Where is the magnetic field the strongest?
 D. What would change if the current was reversed?
 E. How could you make the magnetic field stronger?



8. The wire loop is moving to the right.
 A. Will the loop of wire experience an induced current inside it?
 B. Why?
 C. Will the current flow CW or CCW?

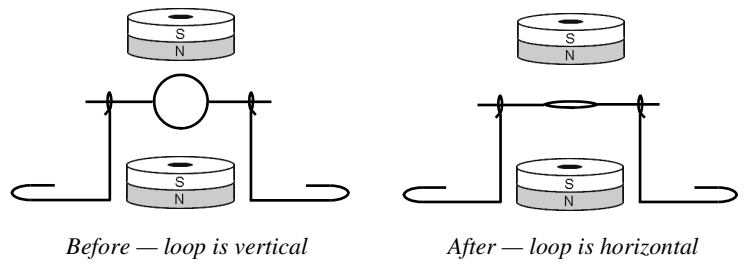


9. Will the loop of wire experience an induced current?
 B. Why?
 C. Will the current flow CW or CCW?

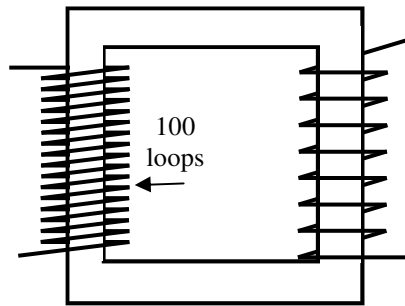


2009-10 Magnetism In Class Review 1

10. The diagram shows a wire loop with electricity flowing around thru it.
- If the front of the loop (facing you) moves up toward the N pole of the top magnet, label the front of the loop as a N or S pole.
 - In the first diagram, which direction is electricity flowing in the loop?
 - If the electricity stays on after the loop has turned, what happens?



- To make it a step-down transformer, which side would be the input voltage?
- To make it a step-up transformer, which side would be the primary?
- How does the amount magnetic flux compare on both sides?
- Which side has the most current?
- What is the square thing inside the coils?
- What does it do?



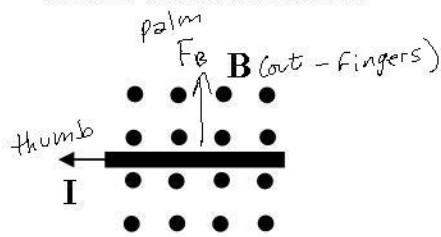
- If the input voltage is 120 V AC and the output voltage is 880 V AC, find the number of loops on the right side.
- If the output current is 6 amps, find the input current.
- What is the output voltage if the left side is hooked up to a 9V battery?

PreAP only:

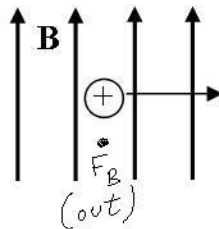
- An electron is moving two-thirds the speed of light (2×10^8 m/s) in a magnetic field. If it feels a 1.12×10^{-10} N force, what is the magnetic field strength?
- A 54cm wire is in a 6.2T magnetic field. If the force on the wire is 2 N, how much current flows thru the wire?

2009-10 Magnetism In Class Review 1

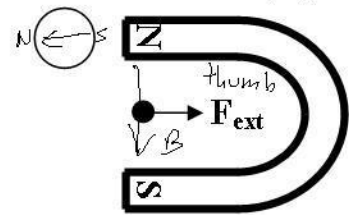
1. A current carrying wire is placed into a magnetic field. Which direction will the wire deflect?



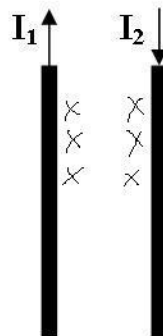
2. A. Find the direction of the magnetic force on the charge.
 B. What if it was an electron?
 C. What if the charge was stationary?



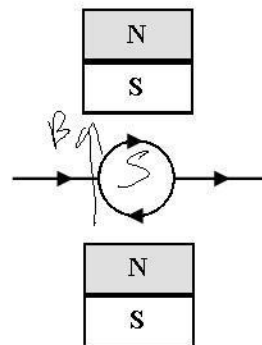
3. A wire is pushed between the poles of a horseshoe magnet. Find the direction of the induced current and compass.



4. A. Above wire 1, which direction does B_1 point?
 B. Will the two wires attract or repel each other?



Right
 B's are same direction, so repel

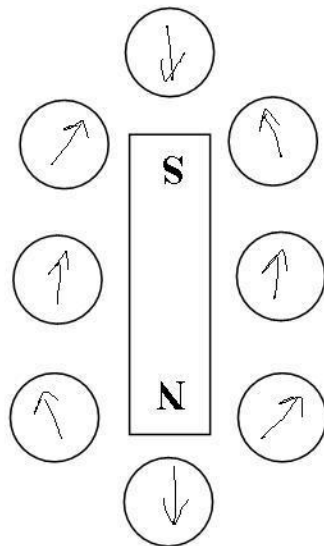


5. A. If the arrows show the direction of current flowing in the wire loop, which direction is north, into or out of the page?

into
 B. Which way will the loop turn? S toward N

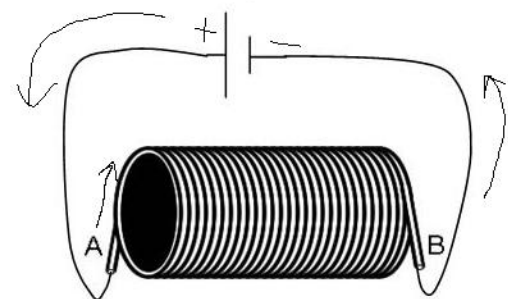
C. This is the simplest example of what?
 motor

6. A. Fill in the compass arrows.
 B. Compasses always point away from what?



N to S
 C. Underneath the earth's north pole is what pole of the earth's internal magnet? S

7. A. Draw the direction of current flowing from the battery.
 B. Which side of the solenoid will be N?
 C. Where is the magnetic field the strongest?
 D. What would change if the current was reversed?
 E. How could you make the magnetic field stronger?



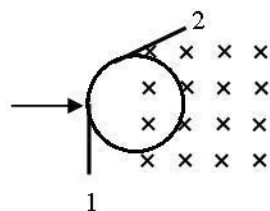
Right
 center
 sides would switch
 more I
 more loops
 iron core

8. The wire loop is moving to the right.

A. Will the loop of wire experience an induced current inside it? yes

B. Why?
 Ding B

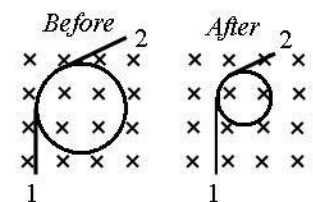
C. Will the current flow CW or CCW?



9. Will the loop of wire experience an induced current? yes

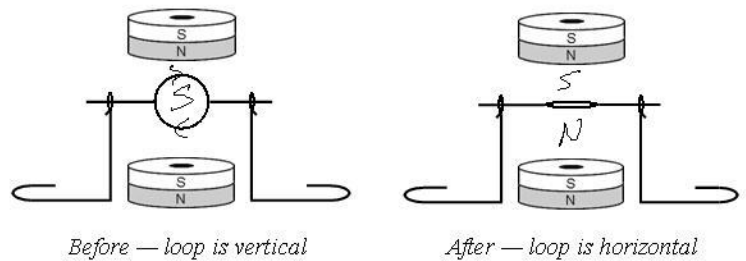
B. Why?
 Ding B

C. Will the current flow CW or CCW?

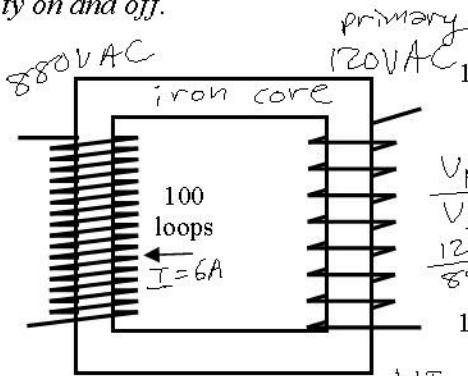


2008 Magnetism In Class Review 1

10. The diagram shows a wire loop with electricity flowing around thru it.
- A. If the front of the loop (facing you) moves up toward the N pole of the top magnet, label the front of the loop as a N or S pole.
- B. In the first diagram, which direction is electricity flowing in the loop? *CW*
- C. If the electricity stays on after the loop has turned, what happens? *Stays there, stuck to the N - needs a commutator to turn the electricity on and off.*



11. To make it a step-down transformer, which side would be the input voltage? *left to R*
12. To make it a step-up transformer, which side would be the primary? *R to left*
13. How does the amount magnetic flux compare on both sides? *some* Φ
14. Which side has the most current?
15. What is the square thing inside the coils? *R iron core*
16. What does it do? *amplifies B*



17. If the input voltage is 120 V AC and the output voltage is 880 V AC, find the number of loops on the right side.

$$\frac{V_p}{V_s} = \frac{N_p}{N_s}$$

$$\frac{120}{880} = \frac{N_p}{100}$$

$$N_p = 13.6 \text{ loop}$$

18. If the output current is 6 amps, find the input current. $I_p = 44A$

$$V I_p = V I_s$$

$$120(I_p) = 880(6)$$

19. What is the output voltage if the left side is hooked up to a 9V battery?

$V = 0$ volts. Batteries only provide DC voltage.

Transformers only work with AC voltage.

PreAP only:

20. An electron is moving two-thirds the speed of light (2×10^8 m/s) in a magnetic field. If it feels a 1.12×10^{-10} N force, what is the magnetic field strength?

$$F = qvB$$

$$B = \frac{F}{qv} = \frac{1.12 \times 10^{-10}}{(1.6 \times 10^{-19})(2 \times 10^8)} = 3.5 \text{ T}$$

21. A 54cm wire is in a 6.2T magnetic field. If the force on the wire is 2 N, how much current flows thru the wire?

$$F = BIL$$

$$2 = 6.2(I)(.54)$$

$$I = \frac{2}{6.2(.54)} = .6 \text{ Amps}$$