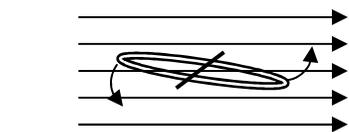
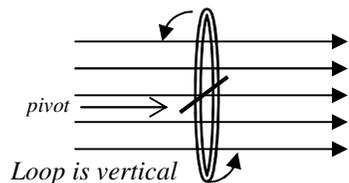


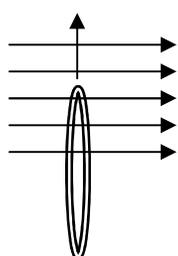
## 2011-12 PreAP Magnetism 6

Let's talk more about breaking magnetic field lines (previous HW, just before Q3). Also, look at the generator discussion at the bottom of the "Induction" notes.

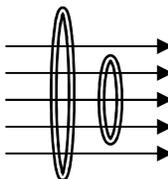


1. A loop is rotated counter-clockwise (CCW) about a diameter in a magnetic field.
  - A. \* When the loop is vertical, is it breaking any magnetic field lines?
  - B. So is there any  $I_{\text{induced}}$  when the loop is vertical?  
  
*Or, by the right-hand rule, the top of the vertical loop is moving parallel to B, so there can't be a RHR force (q and B can't be parallel).*
  - C. When the loop is horizontal, is it breaking any magnetic field lines?
  - D. Is there any  $I_{\text{induced}}$  when the loop is horizontal?
  - E. Using either Lenz's Law or the RHR, determine the direction of  $I_{\text{induced}}$  in the horizontal loop, as viewed from above.

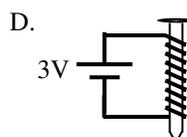
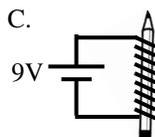
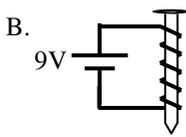
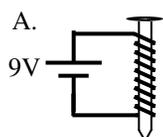
Use Lenz's Law or the RHR to figure out the direction of  $I$  induced in these next two examples.



2. A. As the loop moves into the magnetic field, is B increasing or decreasing in the loop?  
*So  $I_{\text{induced}}$  must oppose the change by making a north to the left.*
- B. As seen from the left, which direction must  $I_{\text{induced}}$  be flowing in the loop?



3. A. As the loop shrinks, does B (the magnetic field) inside the loop increase or decrease?
- B. So the  $I_{\text{induced}}$  opposes the change, making a magnetic field point left or right?
- C. As seen from the left, give the direction of the induced current in the loop.

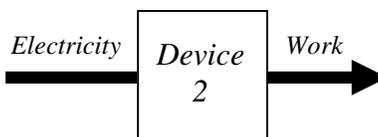
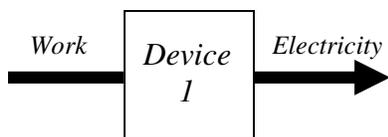


4. Which of the four electromagnets will be the strongest? (*You should be able to figure this out.*)

*A generator generates" electricity by wires being turned thru magnetic fields (or vice versa). Generators take mechanical energy from wind, moving steam (as in power plants), or a belt in your car and turn it into electrical energy. If hooked up in reverse (electricity in) a generator becomes a motor, which takes electrical energy and turns it into motion. A generator can be a motor. A motor can be a generator. Both contain magnets and wires.*

5. Motor, Generator, or Both?
 

A. ___ Creates electricity.	F. ___ Can make electricity.
B. ___ Has loops of wire in it.	G. ___ Used in a hydroelectric dam.
C. ___ Creates motion.	H. ___ Opens the windows in a car.
D. ___ Is turned by a force.	I. ___ Turns when electricity is applied .
E. ___ Device 1 (below).	J. ___ Device 2 (below).



1A) No