

Ex 2) Magnetic field around _____ with current

_____ field flux lines around the conductor w/ current are _____.

To find the _____ of the flux lines:

a) Use _____

b) "_____ Rule"

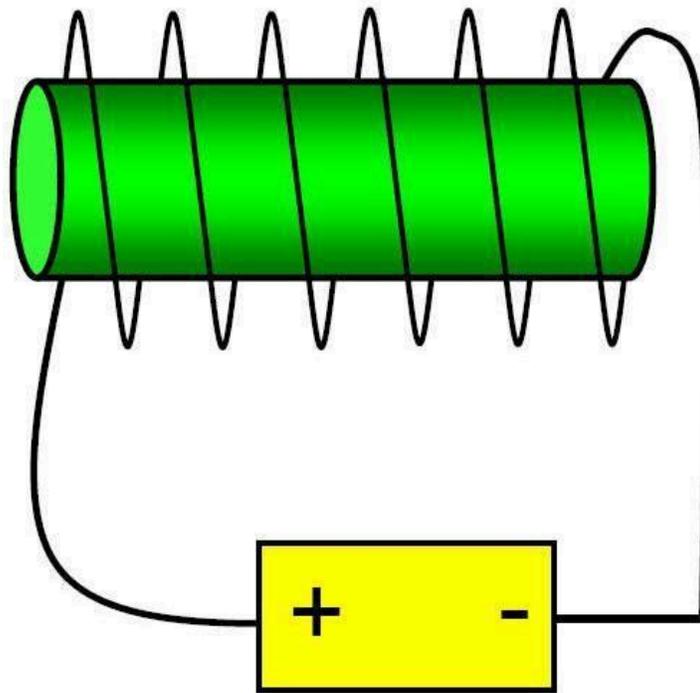
1) Palms _____, _____ hand thumb direction of _____

2) _____ curl in _____ of _____ field



Do the magnetic lines of flux go IN or OUT at the top?

Ex 4) Magnetic field around _____ (Electromagnet)
(conductor arranged in a coiled pattern)



North and South Poles are found at either end of the core.

1. Determine the North and South poles with ...

a) _____ of a Compass

OR

b) 2nd Left Hand Rule

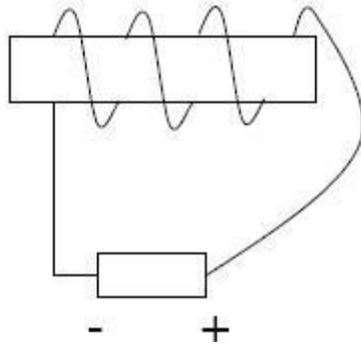
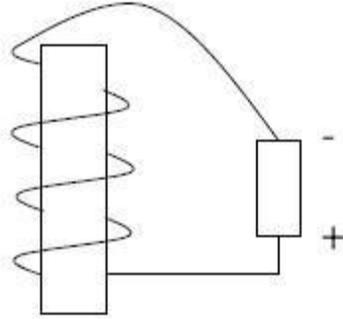
Step 1 - Current travels from _____ terminal

DRAW the direction of the current on the wires

Step 2 - WITH _____, point the _____ of left hand
in direction of current

Step 3 - _____

Find the North Pole of this Solenoid



_____ of a magnetic field of a solenoid can be increased by:

1) Increasing or decreasing the number of turns? (of wire)

2) Increasing or decreasing current?

3) inserting a _____ (increases flux density)

high permeable cores _____

These materials _____, do not increase # of flux lines

Identify the low-permeable materials

C) Magnetic Flux Line Patterns -

2 permanent magnets North/North

2 permanent magnets North/South

(Create _____)

D) Direction of the force on a **wire** carrying current in a **magnetic field**

3rd Left-Hand Rule - Wire in a magnetic field

- 1) Draw magnetic Flux lines (_____)
- 2) **Left Thumb** - Point in the direction of **current**
- 3) Place **four fingers** in the direction of the **magnetic field**
- 4) **Palm** shows the direction of the **force** on the conductor

Top View - Wire in a Magnetic Field - Figure 1

In which direction will the force on this wire be directed? **Up or Down?**

Figure 2

Figure 3

Figure 2 - In which direction will the force on this wire be directed? **Up or Down?**

Figure 3 - In which direction will the force on this wire be directed? **Up or Down?**

The force on the conductor is **maximum** when the conductor is placed _____ to field and **zero** when it moves _____ to the field.

E) Forces between current-carrying wires

Opposite Currents Wires _____

Same Current Direction/**Wires attract**

When wires are _____, **no forces** exist between the wires

F) Magnetic Force on moving charges

When a _____ is shot through a _____ it experiences a force.

If you wanted to **maximize** the **force** on the **charge**:

- How would you shoot a charge through a magnetic field? **Fast or Slow??**
- What kind of charge would you use? **Big or Small??**
- What kind of magnetic field would you use? **Big or Small??**

Generator Principle - Electromagnetic Induction

1831 - Michael Faraday discovered that **current** and **voltage** could be **induced** when
a **conductor moves within a magnetic field.**

(Note: 3-dimensional view)

If this wire is moved _____ (**perpendicular to the field**), **maximum current**
will be generated. If it's moved _____ (**parallel to the field**), **no current** will be
generated.

Third Left-Hand Rule

Step 1: Draw in the flux lines

Step 2: 4 fingers follow _____

Step 3: _____ follows movement of _____ (Given)

Step 4: _____ shows _____ on electrons - The current direction

Example) If the wire in the picture above is moved upward, which way will the electrons flow?

Answer: Into the page OR Out of the page? (circle)

Calculating the voltage induced

(V) Induced voltage - also called _____ - Electromotive Force

V =

B - _____ Field Strength

l - _____ of conductor (in meters)

V - _____ of a conductor moving through the field