

Lesson 85 - **Chart for Determining
 Direction of Induced Current
 According to Lenz's Law**

Right Hand Rules: (*Use your right hand only -- never use your left hand*)

#1 – predicts the direction of the **MAGNETIC FIELD** created by the current in a **straight wire**.

Thumb points in the direction of the **current** in the wire.

Fingers curl in the direction of the **magnetic field** this current creates.

#2 - the **FORCE** on a **MOVING CHARGE** (*The Physics Salute*)

Hand points in the direction of the **velocity** (or current)

Fingers bend to point in the direction of the **magnetic field**

Thumb is pointing in the direction of the **force** on the charge (or current carrying wire)

#3 – predicts the direction of the **MAGNETIC FIELD** created by a current in a **coil of wire**.

Thumb points in the direction of the **current** in the wire.

Fingers curl in the direction of the **magnetic field** this current creates.

Lenz's Law: the induced current will flow in the direction that creates an induced magnetic field **opposing the change** in the external magnetic field.

To solve for **induced current**, always use the **third right hand rule**: Your curled **fingers** should point in the direction of the **induced magnetic field** created by a loop of wire carrying an **induced current** in the direction of the **thumb**.

You must first orient your **fingers** to oppose the **change** in the external magnetic field. Your **thumb** will then be pointing in the direction of the **induced current**.

The table below shows examples of **external field changes** vs **finger directions**.

<u>External field</u>	<u>Fingers</u>	<u>External field</u>	<u>Fingers</u>
X Increasing	•	Right - Increasing	Left
X Decreasing	X	Right - Decreasing	Right
• Increasing	X	Up - Increasing	Down
• Decreasing	•	Up - Decreasing	Up
Left - Increasing	Right	Down - Increasing	Up
Left - Decreasing	Left	Down - Decreasing	Down