Working formula:

- To find the unknown resistance (X):
  - ✓ If unknown resistance is in left gap, then

$$X = \frac{l}{100 - l} \times R$$

$[l = balanced\ length\ (in\ cm) measured\ from\ zero\ end\ (\textbf{point A})]$

  - ✓ If unknown resistance is in right gap, then

$$X = \frac{100 - l}{l} \times R$$

$[l = balanced\ length\ (in\ cm) measured\ from\ zero\ end\ (\textbf{point A})]$

- To find resistivity of the wire (ρ):

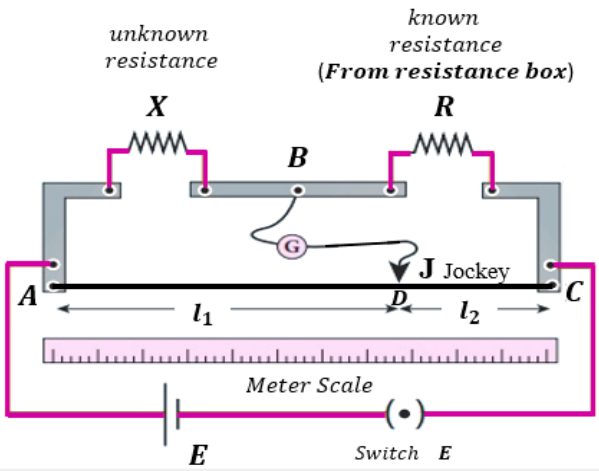
If, $d = diameter\ of\ wire$

$L = length\ of\ the\ wire$

$X = resistance\ of\ the\ wire$ (as obtained from above)

Then,

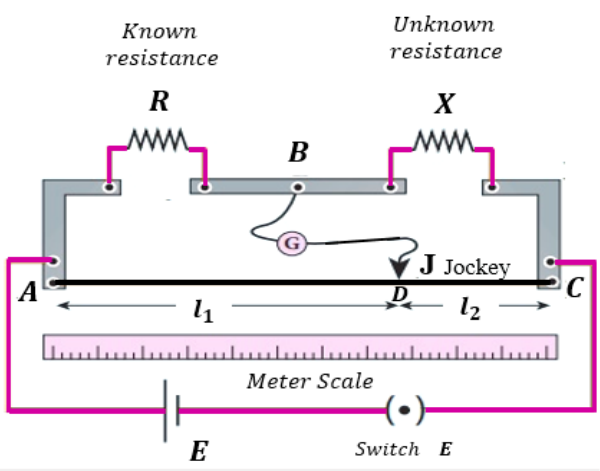
Resistivity, $\rho = \frac{\pi d^2}{4L} X$



Working formula:

$X \times l_2 = R \times l_1$

Case 1: Unknown resistance in left gap



Working formula:

$R \times l_2 = X \times l_1$

Case 2: Unknown resistance in right gap

PROCEDURE:

To find unknown resistance

1. Connect the cell, wire (of unknown resistance X), known resistance (**Resistance box**), galvanometer, jockey as shown in figure (i).

   [unknown resistance in left gap and known resistance in the right gap of the bridge].
2. Take out a resistor (say,**1Ω**) from the resistance box. [Here, known resistance $R = 1\Omega$]
3. Check the galvanometer deflection by placing the jockey at two ends of the bridge wire. If the deflection is opposite, the circuit connection is ok otherwise re-connect the circuit.
4. Slide the jockey from left to right over the bridge wire until the galvanometer shows null deflection. Note the balanced length (l), from the left end (zero end).
5. Repeat the step 4 with changing known resistance to **2Ω and 3Ω.**