

[Magnetic Force] .quiz

1) ammeter

We want to use the exact same apparatus in Magnetic Force lab to measure the current on a wire, i.e. use it as an ammeter. We know the magnetic field of the magnet, and the force can be found using the number on the scale.

- a) Show magnetic field direction on the figures.
- b) Draw the forces on the horizontal and vertical parts of the wire.
- c) In a separate figure, draw the free body diagram for the magnet. Which force you are reading from the scale?
- d) Find the current in terms of the mass,  $m$ , the magnetic field,  $B$ , and the length,  $l$ . Calculate the minimum current we can read using this scale,  $I_{\min}$ , if  $B = 0.1$  T, minimum mass that scale can measure,  $m_{\min} = 0.01$  gr, and the length,  $l = 4.0$  cm.

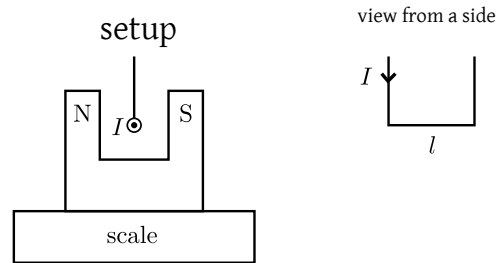


Figure 1: Ammeter, two views of the wire. On the left you see all the setup, on the right we only drew the wire.