

Student worksheets – A worksheet starter

Write some questions based on the ideas in the workshop. Here are some starting-points:

1. In the video you saw the set-up in which the aluminium strip moves downwards when the current flows. There are two changes you can make to the set-up so that the aluminium strip moves UPWARDS. What are these two changes?
2. Here are two graphics you can photocopy and use in test papers. Try the questions yourself.

Figure 1 Let the coil hang so that it can twist freely. The coil in this diagram is a rectangle, not a parallelogram. You are seeing the coil from the side. You close the circuit so that current flows in the directions that the arrows show. Draw the field of the magnets and draw arrows to show the electromagnetic forces on the coil..

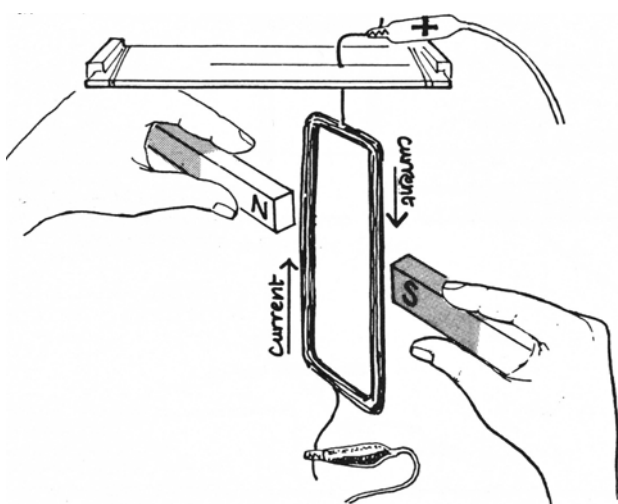
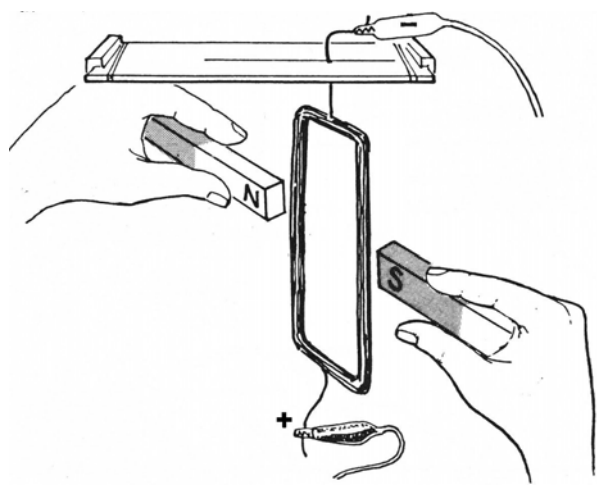


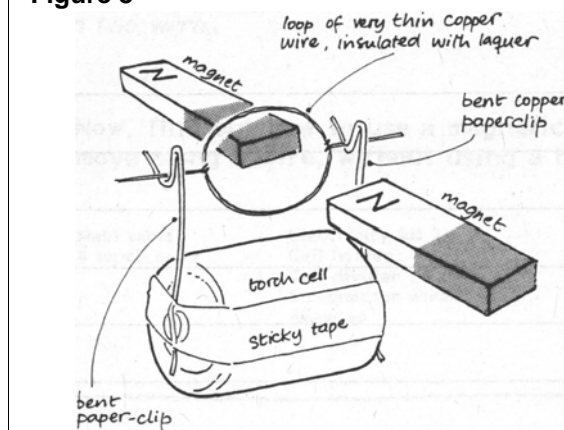
Figure 2 Now the battery is connected so that the current flows the opposite way around the loop. Draw the current direction and the directions of the electromagnetic forces on the coil



3. The aluminium strip is **non-magnetic**, yet it moves when a current flows along it at right angles to the field of the magnet. What questions can you ask about this?
4. If you replaced the aluminium strip with a thin iron wire, would that change the movement?
5. If you held the aluminium strip **parallel** to the magnetic field, would you still see the electromagnetic force move the strip?
6. Why will the little motor not work if you make the coil from iron wire?
7. Real electric motors don't use permanent magnets, except for very small motors. Mostly they use electromagnets that draw current from the same supply as the spinning coil.

Look at Figure 3 and redraw it, showing how to replace the bar-magnets with electromagnets.

Figure 3



8. Investigate and record the shape of the magnetic field of a ring magnet.