

Electric current is a movement of electric charge. If a positive charge moves, the direction of electric current is the velocity of the positive charge. If a negative charge moves, the direction of electric current is the opposite of the velocity of the negative charge. The more electric charge passes circuit, the greater the electric current. Actually the value of the electric charge is defined by the amount of charge passing through a given circuit per unit time. This is what happens when you switch on a battery.

In 1820, during a lecture Danish physicist Ørsted discovered that the compass needle turned when switching on and off electric current. In other words, electric current generates magnetic field. See Figure 1. B is the magnetic field and I is the electric current. The direction of B indicates the direction the north pole of compass needle aligns. (Remember our earlier article "magnetic field.") You also see that the magnetic field generated is perpendicular to the electric current. Also in Figure 2, you see that it is easy to remember the direction of magnetic field if you use "right hand grip rule"

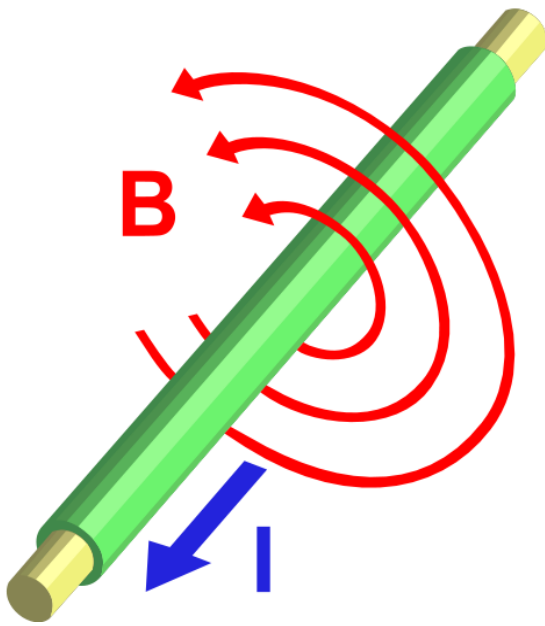


Figure 1

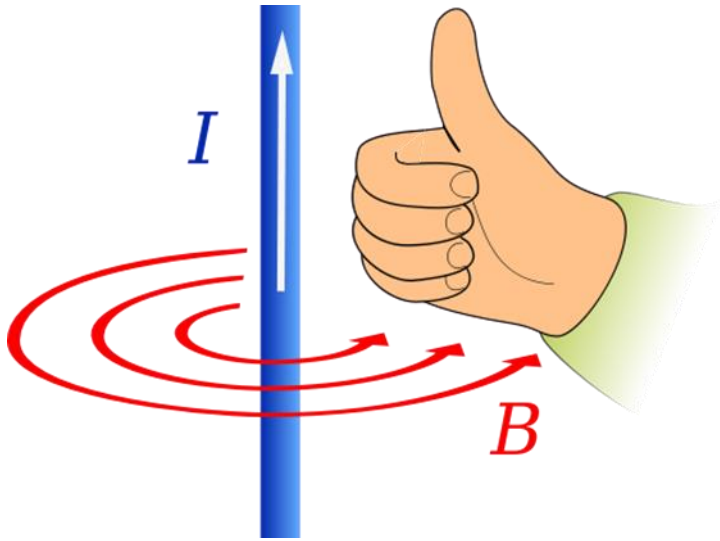


Figure 2

In reality, it is a little hard to draw 3 dimensional figures like Figure 1 and Figure 2. So, there is an easier way to draw the figures. See Fig.3. Fig.3 is a two-dimensional figure version for Fig.2. The middle circle with the dot in the center represents the electric current is flowing in the direction out of the page. Magnetic field is also drawn there that matches with right hand grip rule. On the other hand, current flowing in the direction into the page is represented with x mark at the center. See Fig.4. You can also check that in this case the magnetic field is clockwise direction, compatible with the right hand grip rule.

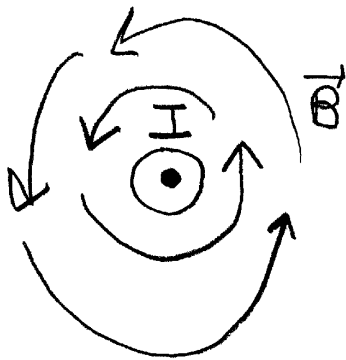


Figure 3

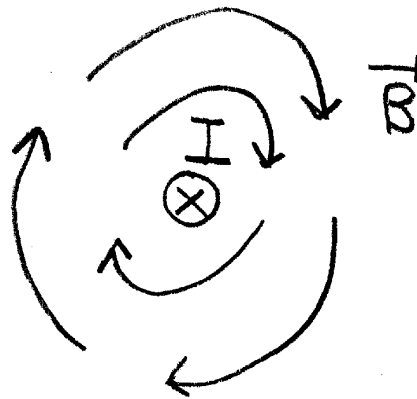


Figure 4

Summary

Electric current is a movement of electric charge. If a positive charge moves, the direction of electric current is the velocity of the positive charge. If a negative charge moves, the direction of

electric current is the opposite of the velocity of the negative charge.

The direction of magnetic field generated by electric current is given by right hand grip rule.

(Figure 1 is from <http://en.wikipedia.org/wiki/File:Electromagnetism.svg>

Figure 2 is from <http://en.wikipedia.org/wiki/File:Manoderecha.svg>)