3.3 Grade 9

CONCEPT 3

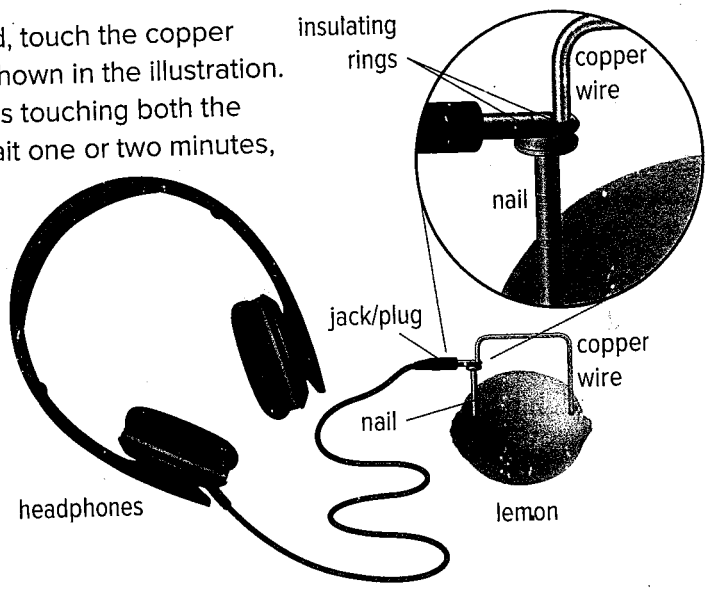
Moving electrical charges form an electric current.

Activity

Electric Lemon

Safety: Advise your teacher if you are allergic to citrus fruits.

1. Stick a copper wire into one end of the lemon and a non-galvanized nail into the other.
2. Bend the top of the copper wire so it nearly touches the nail.
3. Put on the headphones. Hold the plug of the headphones on top of the nail and listen.
4. With your other hand, touch the copper wire to the plug as shown in the illustration. Make sure the plug is touching both the nail and the wire. Wait one or two minutes, listening carefully.
5. Try to account for the differences you observed.



current moving charges

Connect to Investigation 3-D on page 230

Charges can flow from a source through conducting materials to an appliance or an electrical device, such as a cellphone. Chemical energy from the source causes charges to move through the conductor, usually wires, carrying energy to the device. The moving charges are called an electric **current**. You need to remember the symbol and units for current because you will be using them in calculations in the next Topic.

- The symbol for current is I.
- Current is measured in units called amperes. The symbol for amperes is A.

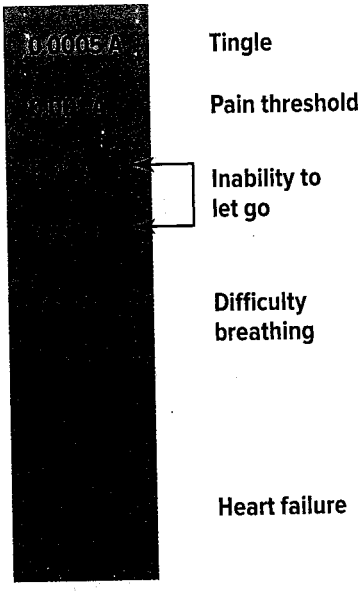
For example, the equation $I = 3$ A means that the current (I) is three amperes (3 A).

The smaller unit of electric current is the milliampere (1A = 1000 mA).

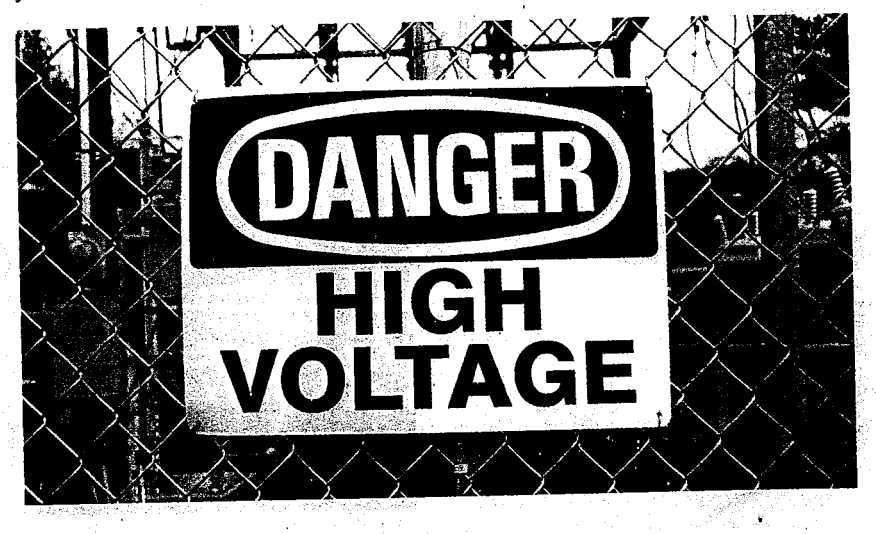
Activity

Effects of Voltage and Current on the Human Body

The scale on the right shows how the effects of current on the human body vary with the amount of current that flows through the body. The voltage is 120 V, the standard household voltage. Study the scale and then answer the questions that follow.



1. Find out what the electric current is in homes in B.C. What type of caution does the scale on the right suggest that you should take around household currents? Justify your response.
2. Electric current is used in some medical applications to treat health problems. Find out more about these applications and choose one that interests you. How does the treatment work? What kind of voltage and current is involved? What safety precautions, if any, are taken during the treatment?
3. Electrical hazard warning signs often say "Danger High Voltage." Considering the effects of current on the human body, do you think this warning should refer to current rather than voltage? Discuss your ideas as a class.



Before you leave this page . . .

Connect to Investigation 3-E on page 232

1. Describe the relationship between moving charges and electric current.