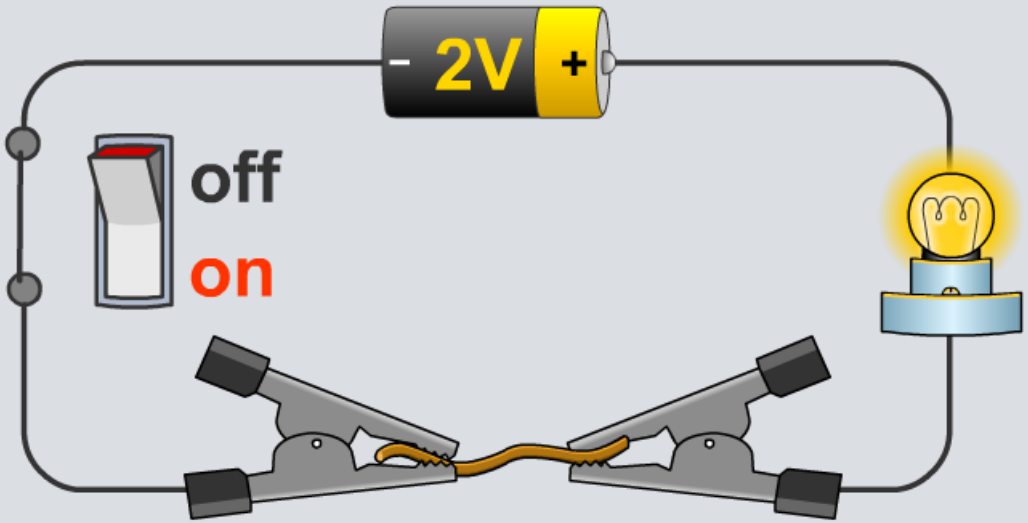
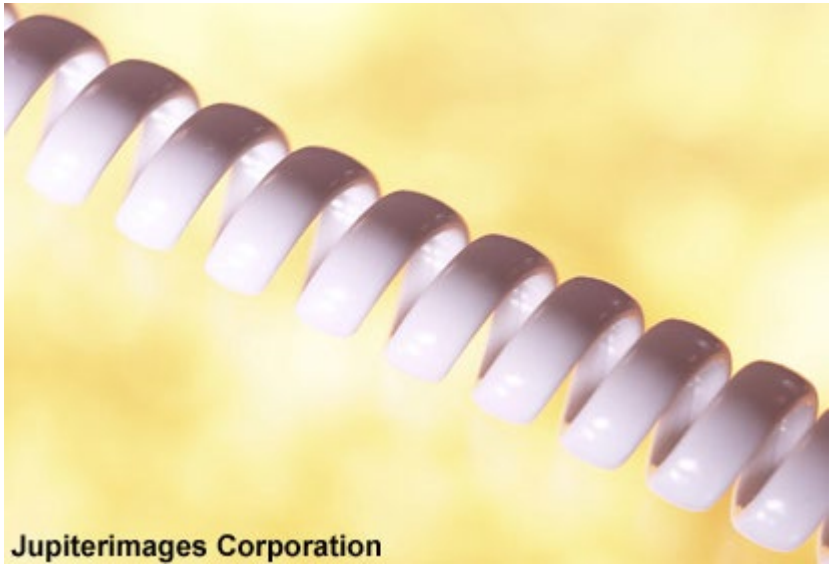
Conductors and Insulators



What are conductors and insulators?

In some materials the electric charges are not free to move. This means the current cannot flow.

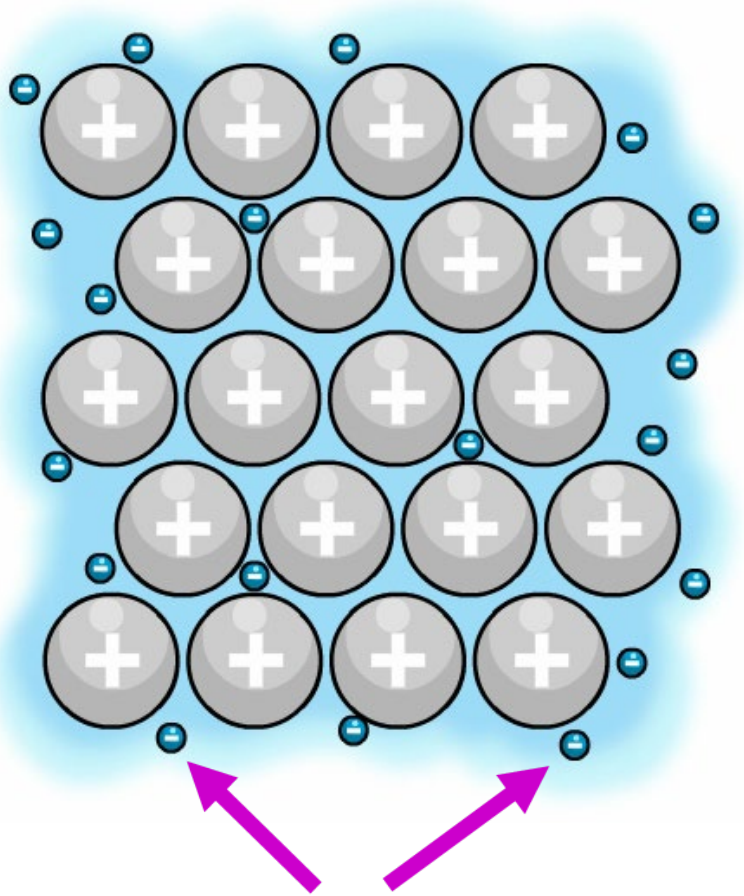
Conductors are materials that allow the flow of electric charge. Metals are good conductors.



Insulators are materials that do not allow the flow of electric charge. Plastic is an example of a good insulator.

How do metals conduct electricity?

It is the delocalized electrons involved in metallic bonding that allow metals to conduct electricity.



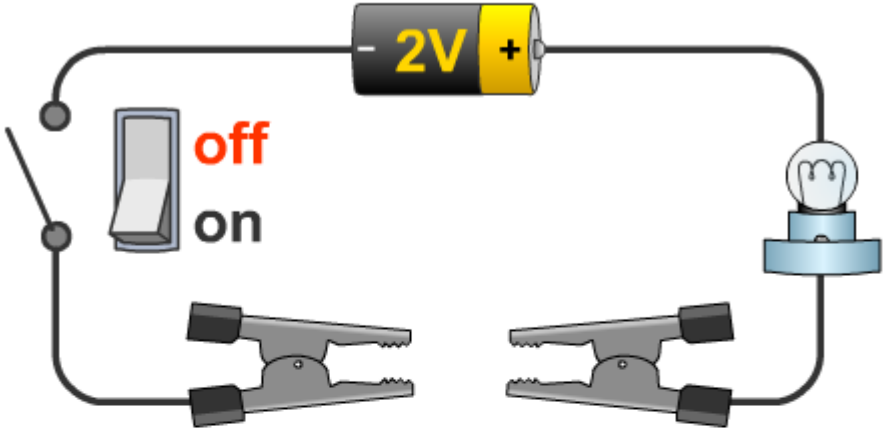
The delocalized electrons are free to flow through the metal and so carry a current.

Insulating materials do not contain free electrons and so current is unable to flow.

Ionic solutions are also able to conduct electricity because they have mobile charge-carrying particles.

Does it conduct?

Which substances will conduct electricity?



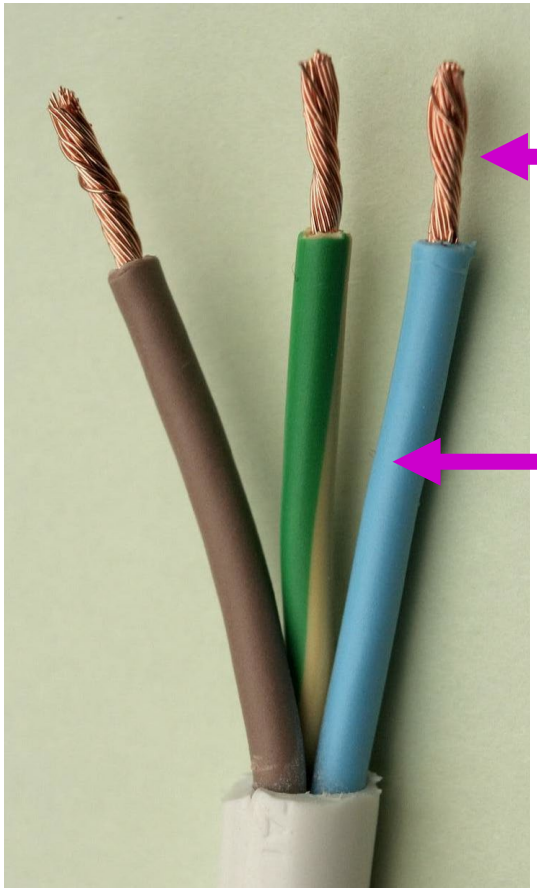
The ability of a substance to conduct electricity depends on whether it contains free electrons or ions – these are needed to carry an electrical charge.

substance bank

- copper
- pure water
- NaCl solid
- NaCl solution
- NaCl liquid
- sugar solution

Why do cables have plastic coatings?

Electricity and electric wires can be very dangerous.
Insulators can be used to make wires safer.



Metals, usually copper, are used to make electrical wires because they conduct current.

To prevent electric shocks, the metal wires are coated with a thick layer of plastic.

How does this increase safety?

Plastic is an insulator and does not conduct current.

Conductors and insulators

Complete each statement about conductors and insulators

Metals are able to conduct because...	Insulators are not able to conduct because...	Ionic compounds can conduct in solution because...
?	?	?
...they do not have any free electrons.	...their ions are free to move.	...they have lots of free electrons.

solve