



Draw a Circuit

Can a pencil conduct electricity?

Try this!



Lay down some graphite! Use the drawing pencil to color in the box on the paper. Make it nice and dark!

(Graphite is the real name for pencil lead.)



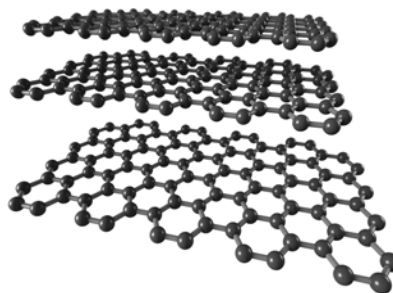
Touch the two insulated wires to the graphite box. Listen closely—what happens?

Now try moving the wires closer together and further apart. Do you notice a difference?

The buzzer sounds because the graphite conducts electricity. Graphite is made of many layers of carbon stacked on top of each other.

What's going on?

The graphite on the paper conducts electricity. It completes an electrical circuit, making the buzzer sound. Graphite is a mineral made of many layers of carbon stacked on top of each other.

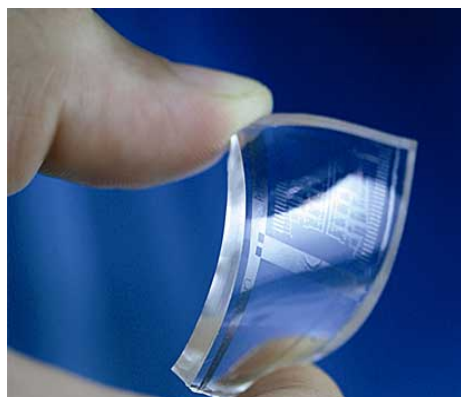


Model of graphite

Graphene, a relatively new nano material, is also made up of carbon atoms. It's only one atom thick—that's a fraction of a nanometer! (A nanometer is a billionth of a meter.) In 2010, scientists won a Nobel Prize in Physics for creating graphene out of graphite. Their celebrated method was surprisingly simple. They used ordinary transparent tape to peel apart layers of graphite until it was very thin. Then they measured their results and found out that they'd made graphene!

How is this nano?

In the field of nanotechnology, scientists and engineers make new, nano-sized materials and devices. Graphene has a lot of useful properties. It's flexible, super strong, and nearly transparent—and it conducts electricity.



Flexible graphene circuit

Computer chip manufacturers are developing circuits from graphene, by modifying it to make it a semiconductor. One day, graphene could be used to make see-through, bendable electronic displays, and tiny, fast computer chips.