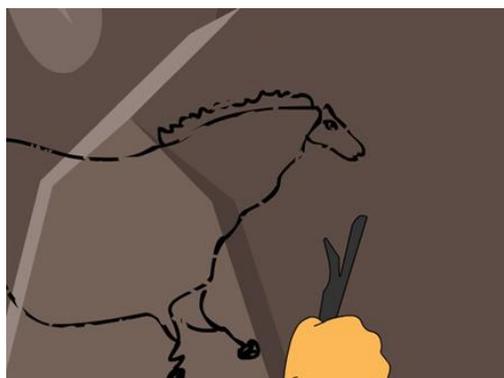


The Secret Science of Pencils & Erasers

The First “Pencil”?

A burnt stick from a fire may have been the first “pencil”. The carbon in the charred wood may have been used to make dark lines for drawing.



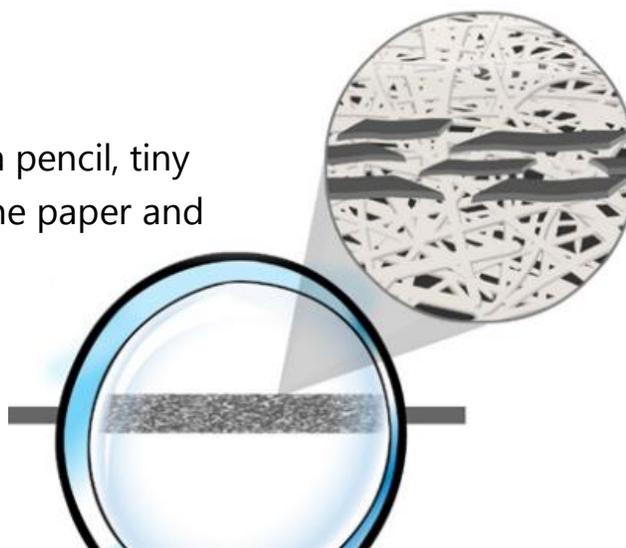
Pencil “Lead”

“Lead” that is Not Lead

The “lead” in a pencil isn’t actually made from lead. It is made from a form of carbon called graphite. The graphite is mixed with clay and formed into long thin pencil lead.

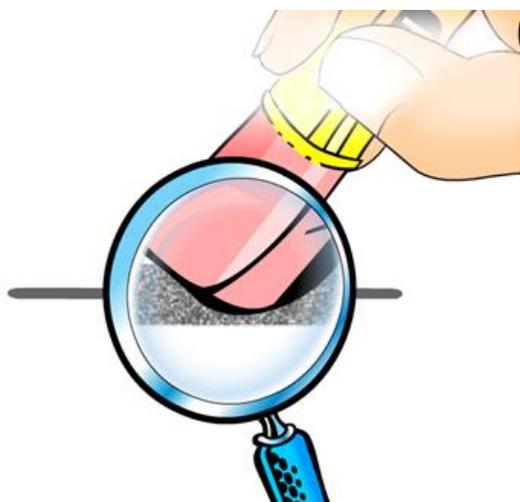
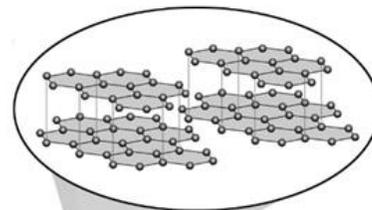
Sticking To It

When you write or draw with a pencil, tiny pieces of pencil lead stick to the paper and make a mark.



Molecules Make the Mark

Each tiny piece of pencil lead is made up of many molecules of graphite. Graphite molecules are flat groups of carbon atoms that are stacked in layers. The layers slide against each other and allow the lead to slide off the pencil point and onto the paper.



Rub it Out

When you erase with a rubber eraser, the graphite in the lead sticks to the rubber better than it does to the paper.

Mistakes Get the Brush-off

A good eraser picks up the graphite and holds it in little eraser crumbs which can be brushed away.



More Cool Chemistry

What does the number on the pencil mean?

The pencil "lead" is actually a mixture of graphite and clay. More clay in the mixture makes the lead harder. A harder lead has a higher number. Pencils are numbered from 1-3 but most people use a number 2. Harder lead makes a lighter mark and softer lead makes a darker mark.



How long does a pencil last?

It's been estimated that the average pencil has enough graphite to write about 45,000 words!

What if you made a mistake before they invented erasers?

Before using rubber for erasing, people used to use bread!

