

# ILLUMINATING MATTER

For hundreds of years, scientists have been using light to help them work out the structure of materials and chemicals. This information is contained within the beautiful patterns created when light and matter interact.

These patterns help scientists to create realistic models of structures and chemicals. Through careful, calculated experiments, scientists can predict how chemicals may react to make explosions, new flavours, materials, and indeed new useful chemicals.

Everything is made from tiny particles called atoms. When more than one atom is joined together, they form a molecule. Life on Earth is based on 4 very important atoms called, carbon, hydrogen, nitrogen and oxygen. Here are the structures of three molecules containing these atoms.

Use the key to help you work out what these molecular structures are. Add up the colours and write down the number next to the right atom symbol. Well done! You've found the ingredients of this molecule. Does the picture help you guess what this might be? Use the internet to find out if you're right. Type the letters and numbers into an internet search engine to find the answers.

## KEY

<b>BLACK</b>	<b>Carbon</b>	<b>(C)</b>
<b>WHITE</b>	<b>Hydrogen</b>	<b>(H)</b>
<b>BLUE</b>	<b>Nitrogen</b>	<b>(N)</b>
<b>RED</b>	<b>Oxygen</b>	<b>(O)</b>

1. C...H...N...O...



2. C...H...N...O...

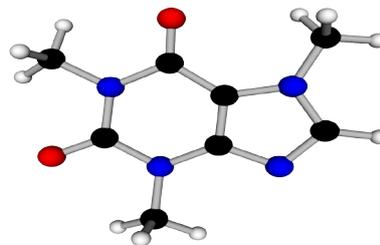


3. C...H...N...O...

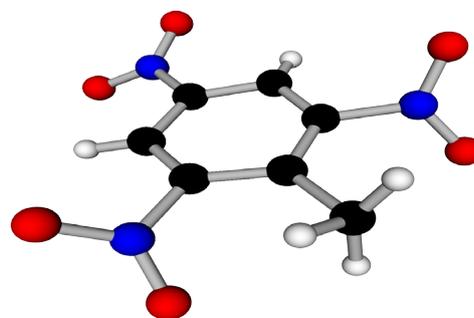


Now discuss your findings to see who got it right!

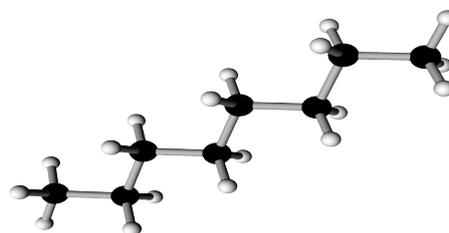
1.



2.



3.



## Do you know these illuminating facts?

1) Light travels at 300,000 kilometres every second!

2) The sunlight we see on Earth left the Sun 10 minutes ago.

3) There are many different types of light. Light that helps us see where we are going is visible light. Hospitals use light we can't see called X-rays to look inside our bodies to capture images of our bones.

4) Scientists shine X-rays onto materials and molecules to help them identify their structure. This method is called crystallography.

5) Crystallography has generated more Noble Prize Winners than any other scientific technique, including finding the structure of your DNA! Crystallography was used by a British scientist, Rosalind Franklin, to discover the structure of a very important molecule called DNA. This molecule, deoxyribonucleic acid, is the instruction book to make every living thing. It's the molecule of life.

What else can you find out about Rosalind Franklin and other scientists using light?

Can you discover and share an astonishing science fact?