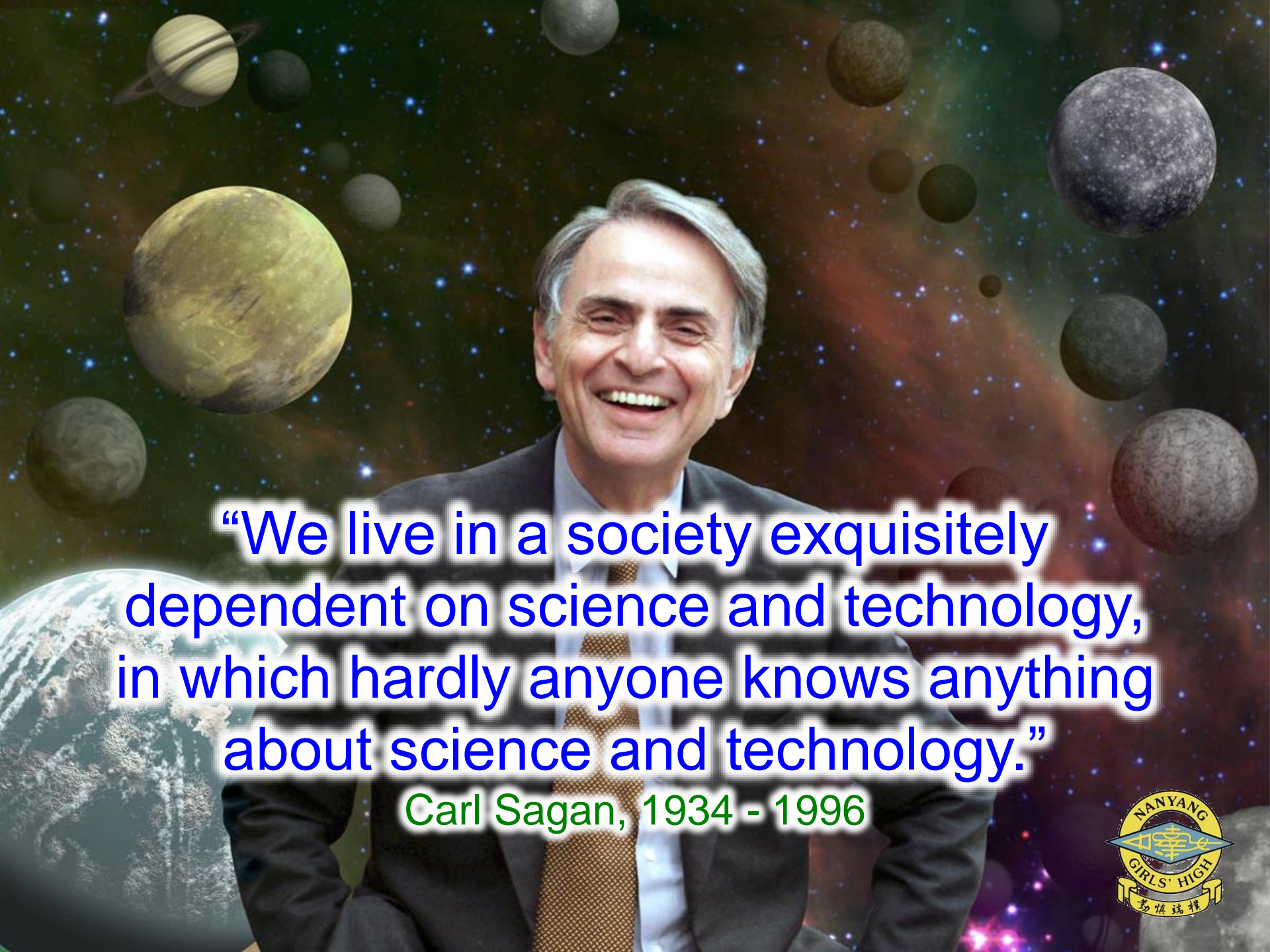




What is
Chemistry?



A portrait of Carl Sagan, a smiling man with grey hair, wearing a dark suit, white shirt, and a patterned tie. He is positioned in the center of the frame. The background is a vibrant, colorful depiction of outer space, featuring a large Earth in the bottom left, a yellowish planet with a ring (Saturn) in the top left, and various other planets and moons in shades of grey, brown, and blue. A bright, colorful nebula is visible in the upper right. The overall scene is set against a dark, star-filled sky.

“We live in a society exquisitely dependent on science and technology, in which hardly anyone knows anything about science and technology.”

Carl Sagan, 1934 - 1996



What is Chemistry?

- Why learn Chemistry (even if you don't want to be a Chemist)? Students can see themselves...
 1. As *creators* of new Scientific knowledge (Scientists).
 2. In Science *careers* (e.g. Doctors and Veterinarians).
 3. As *citizens* who use Science in decision making.
 4. As *consumers* who apply their Science knowledge.
 5. As *critics* of the misuse of Science.
 6. As *connoisseurs* who enrich their lives with Science.
 7. As *collaborators* with Scientists.
 8. As those who can make *connections* beyond Science.



What is Chemistry?

Definition:

- The branch of science concerned with the substances of which matter is composed, the investigation of their properties and reactions, and the use of such reactions to form new substances.



What is Chemistry?

...
It's more than
just that!



What is Chemistry?



What is Chemistry?

Are all Chemists “Mad Scientists?”



What is Chemistry?



What is Chemistry?

...or are Chemists responsible people with high moral values?



What is Chemistry?



What is Chemistry?

At school, girls are just as good as boys at doing Chemistry...



What is Chemistry?

...but are women well represented in the field of Chemistry later in life?



What is Chemistry?



What is Chemistry?

Do Chemists always wear white lab coats and work in a laboratory?



What is Chemistry?

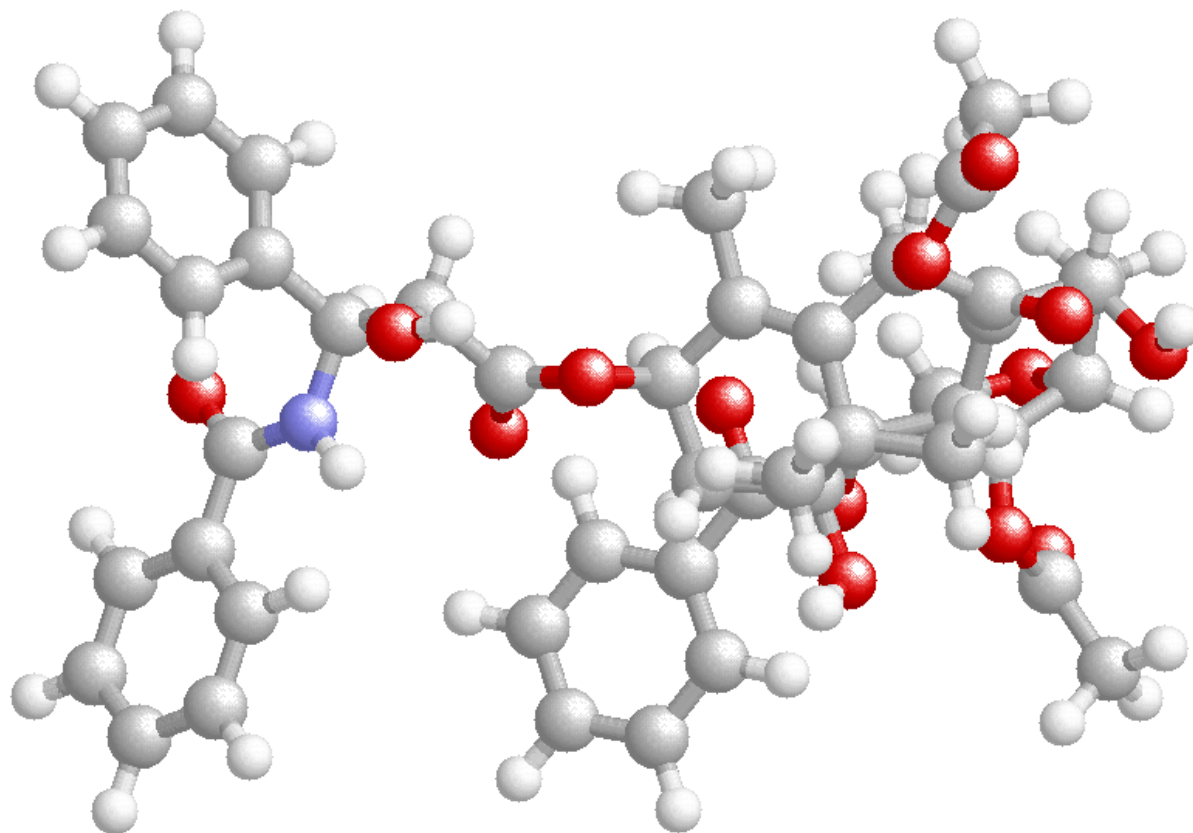


What is Chemistry?

Can only humans do Chemistry?



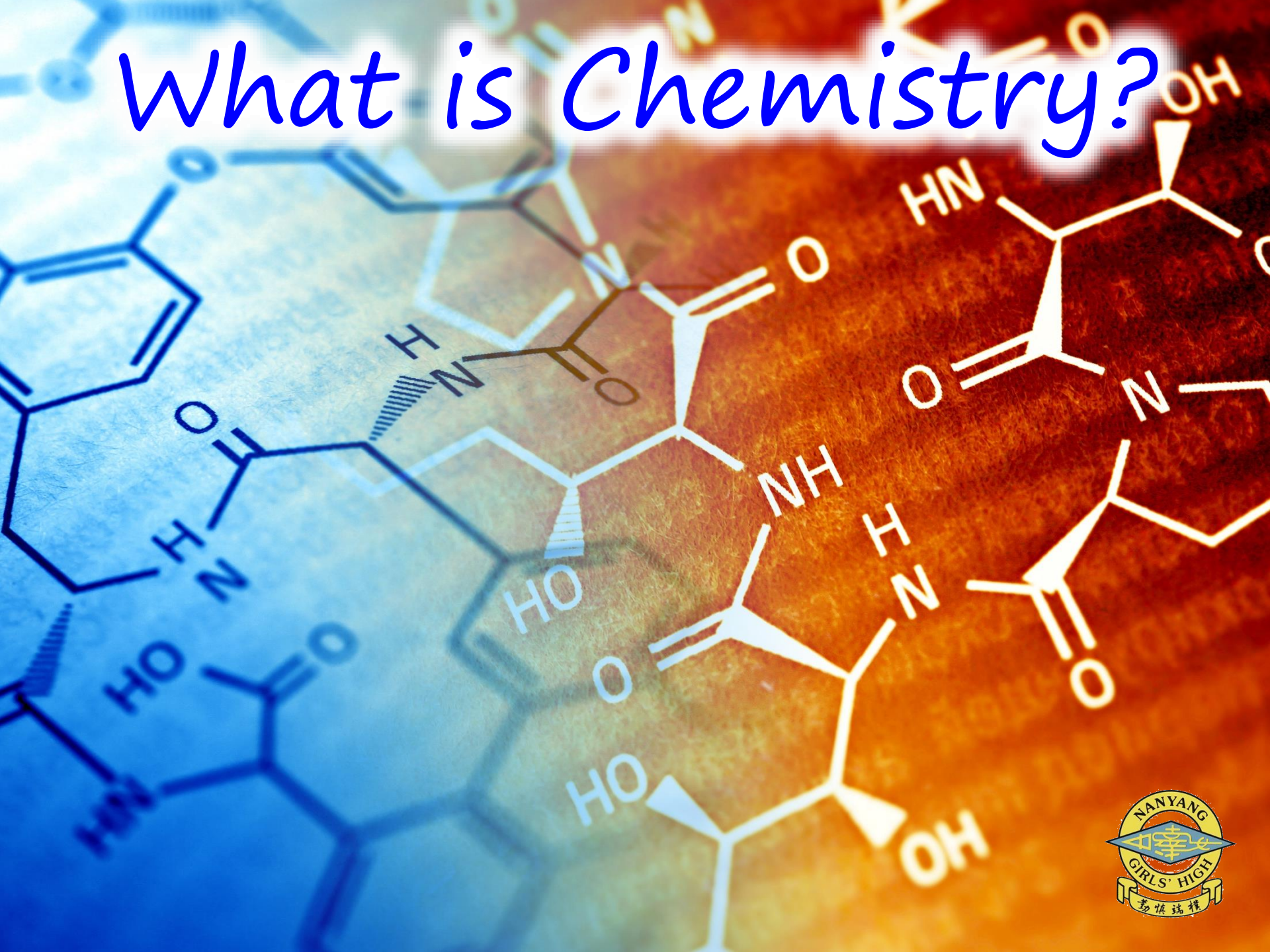
What is Chemistry?



Taxol, an anti-cancer drug
extracted from the Pacific Yew.



What is Chemistry?

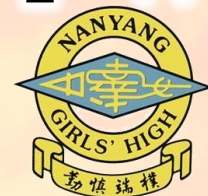
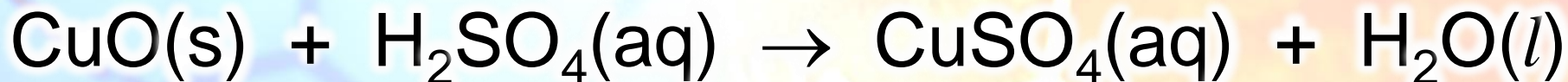
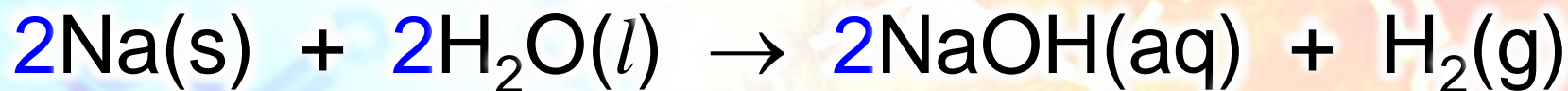
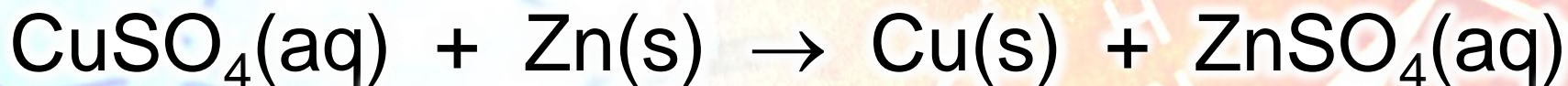
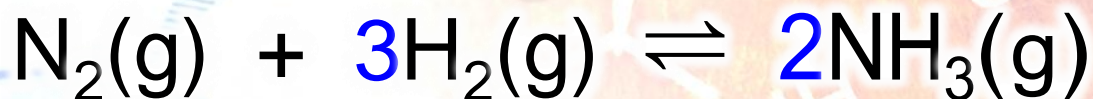
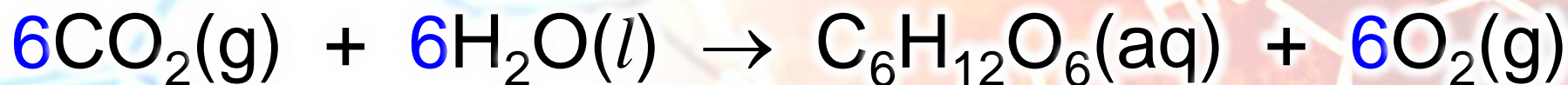


What is Chemistry?

Is Chemistry just lots of equations
and calculations?



What is Chemistry?



What is Chemistry?

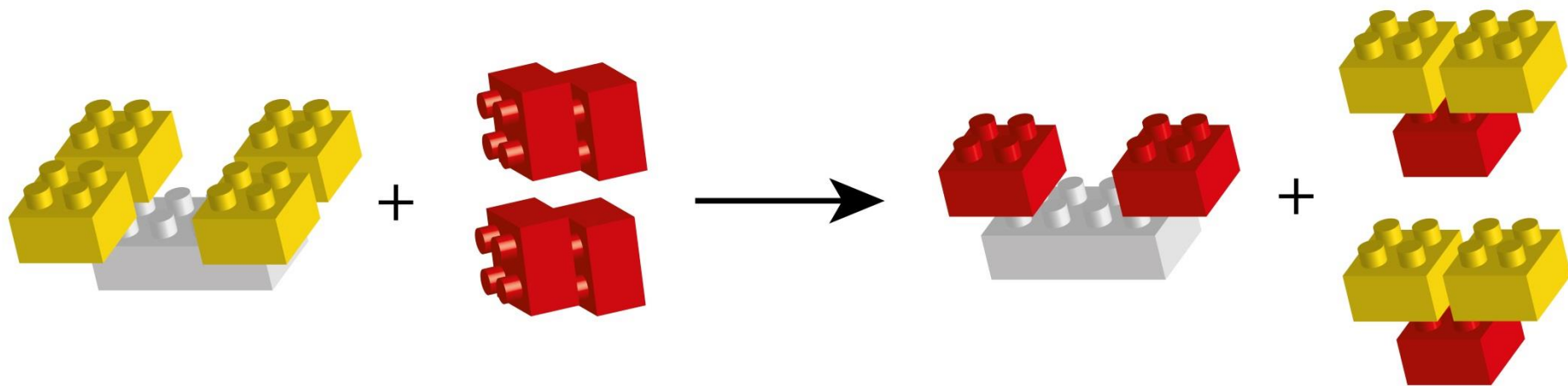
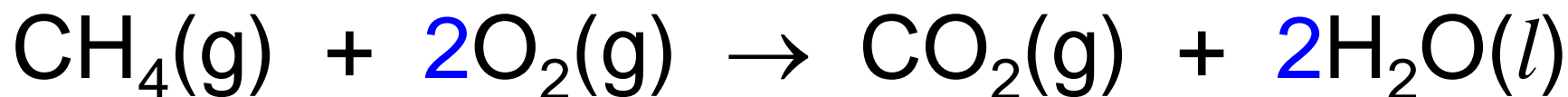


**This is just one way in which
Chemists communicate their ideas.
Every discipline has its own way of
communicating information.**



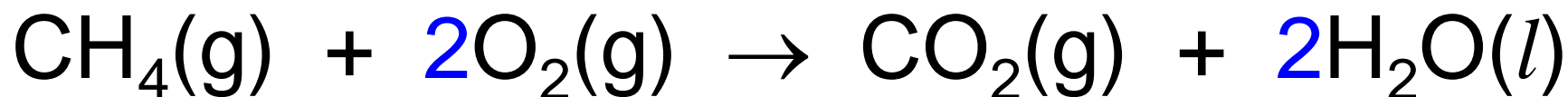
What is Chemistry?

methane + oxygen \rightarrow carbon dioxide + water



What is Chemistry?

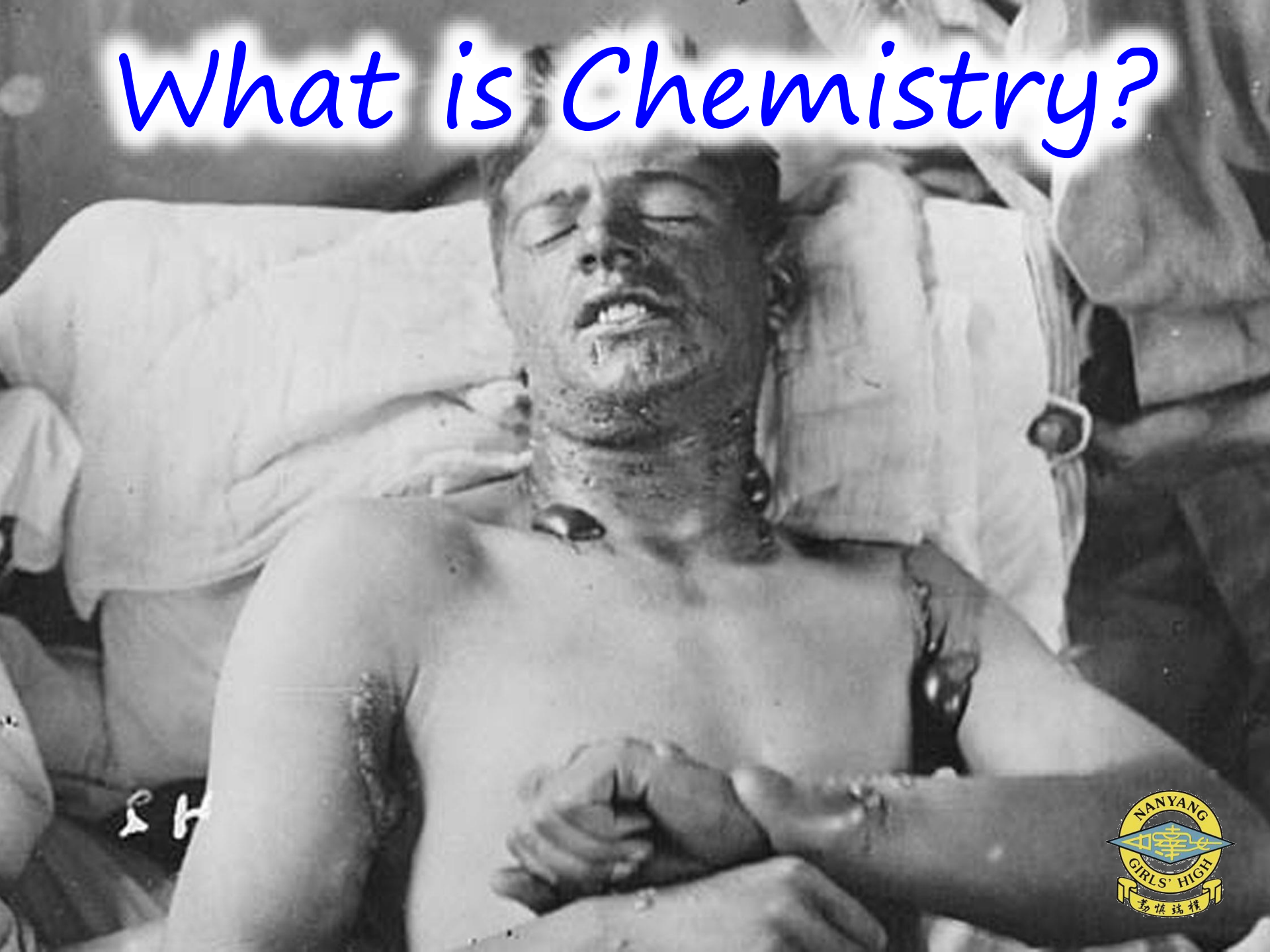
methane + oxygen → carbon dioxide + water



Is Chemistry difficult?



What is Chemistry?



What is Chemistry?

Can Chemistry harm you?



What is Chemistry?

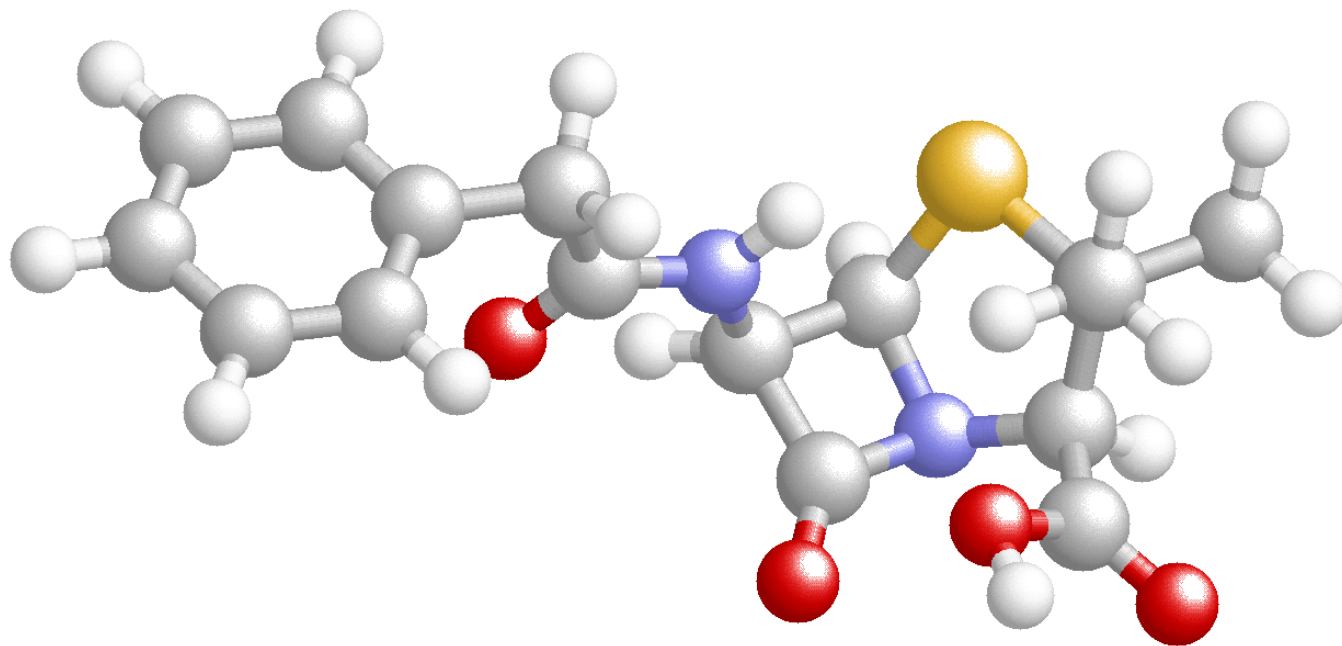


What is Chemistry?

Can Chemistry save your life?



What is Chemistry?



Penicillin, an accidental discovery
by Alexander Fleming in 1928.



What is Chemistry?



Penicillin, an accidental discovery
by Alexander Fleming in 1928.



What is Chemistry?



What is Chemistry?

What does Chemistry look like?

Is Chemistry beautiful?



What is Chemistry?



What is Chemistry?

...or is Chemistry unpleasant?



What is Chemistry?



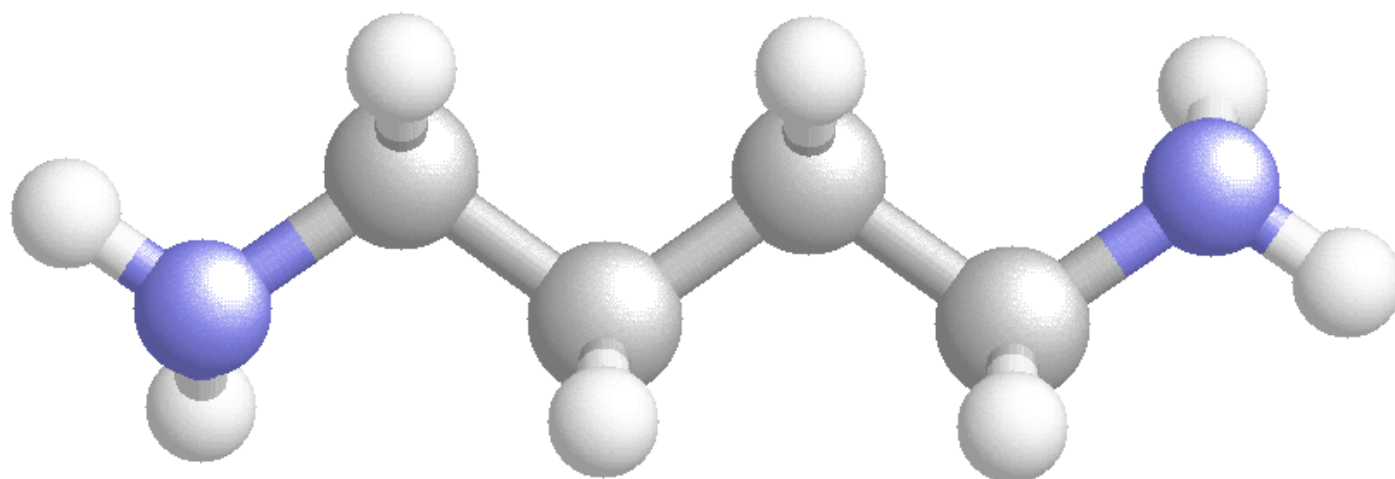
What is Chemistry?

What does Chemistry smell like?

Does Chemistry have
a nice aroma?



What is Chemistry?



...or does Chemistry smell revolting?

Putrescine,
literally smells putrid!



What is Chemistry?



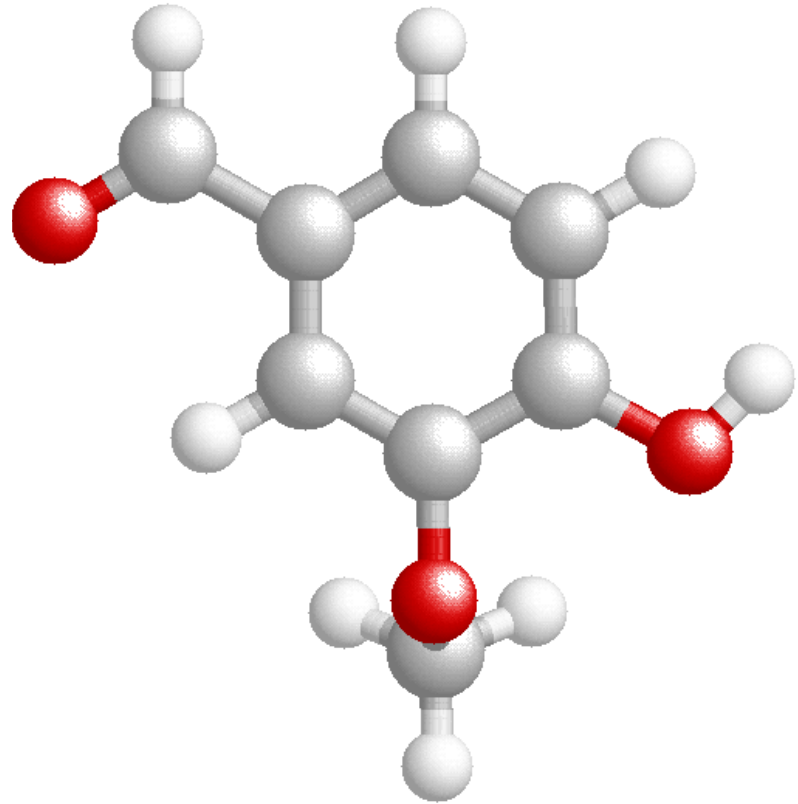
What is Chemistry?

What does Chemistry taste like?

Does Chemistry have a
pleasant taste?



What is Chemistry?

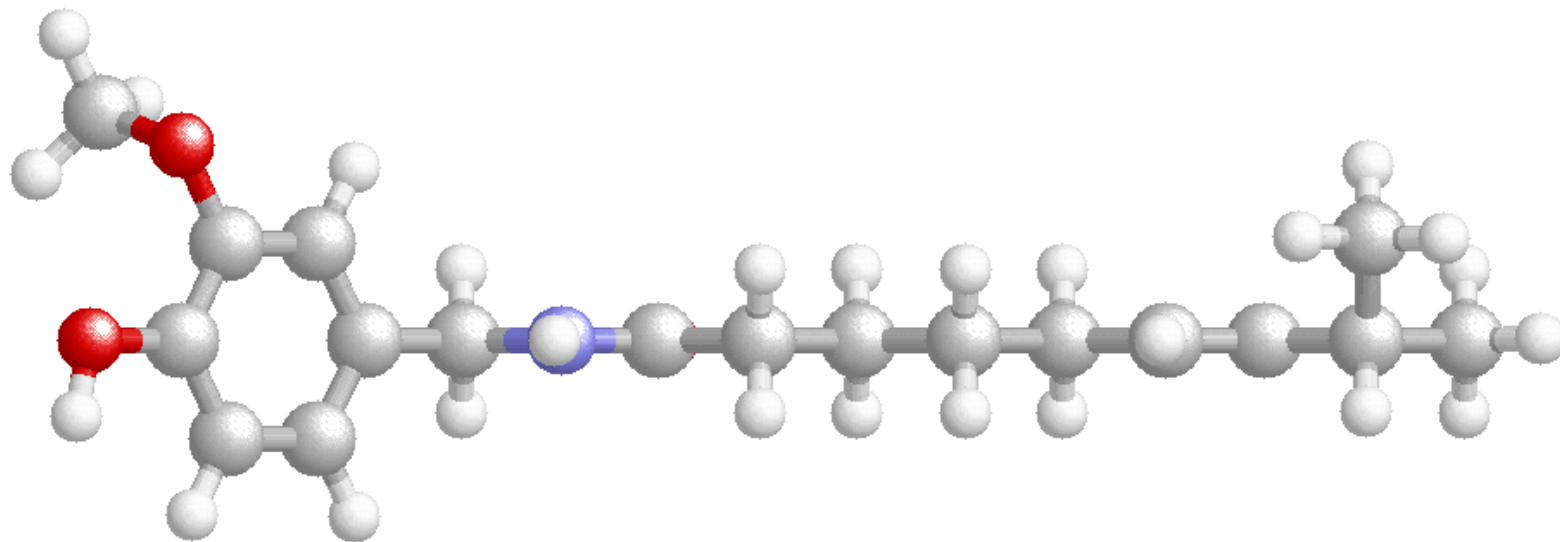


Vanillin

What is Chemistry?



What is Chemistry?



...or is Chemistry too hot to handle?

Capsaicin



What is Chemistry?



What is Chemistry?

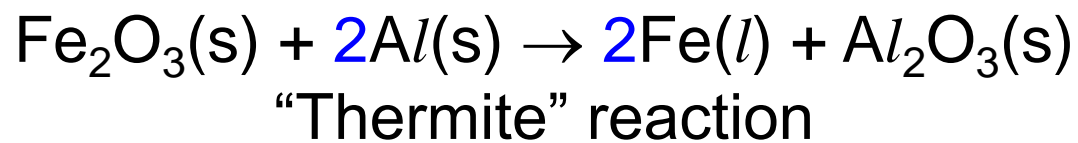
Do Chemical reactions always catch fire?



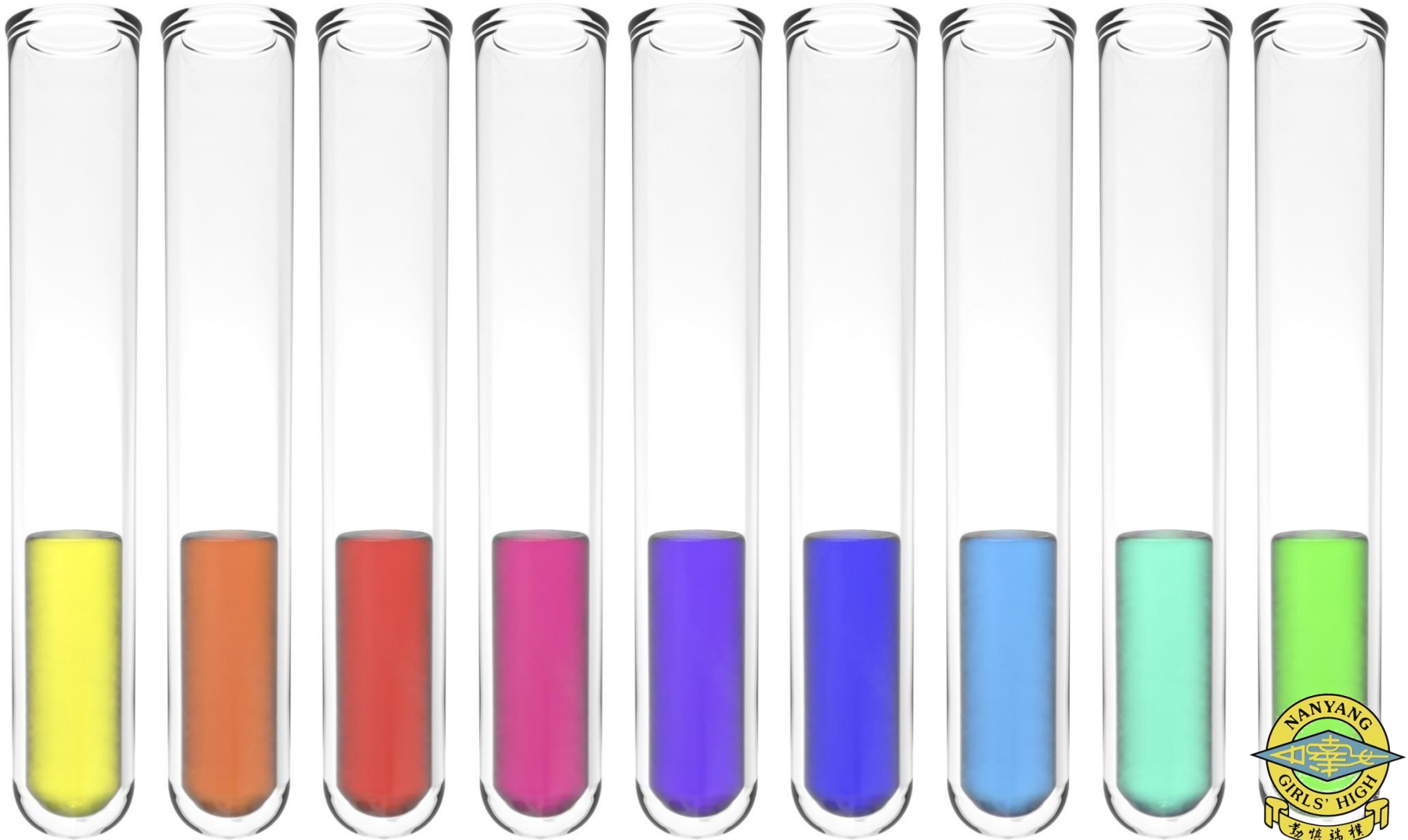
What is Chemistry?



Duration
18 s



What is Chemistry?



What is Chemistry?

Is Chemistry always done in test tubes?



What is Chemistry?



What is Chemistry?

...or can Chemistry be done on a large scale?



What is Chemistry?

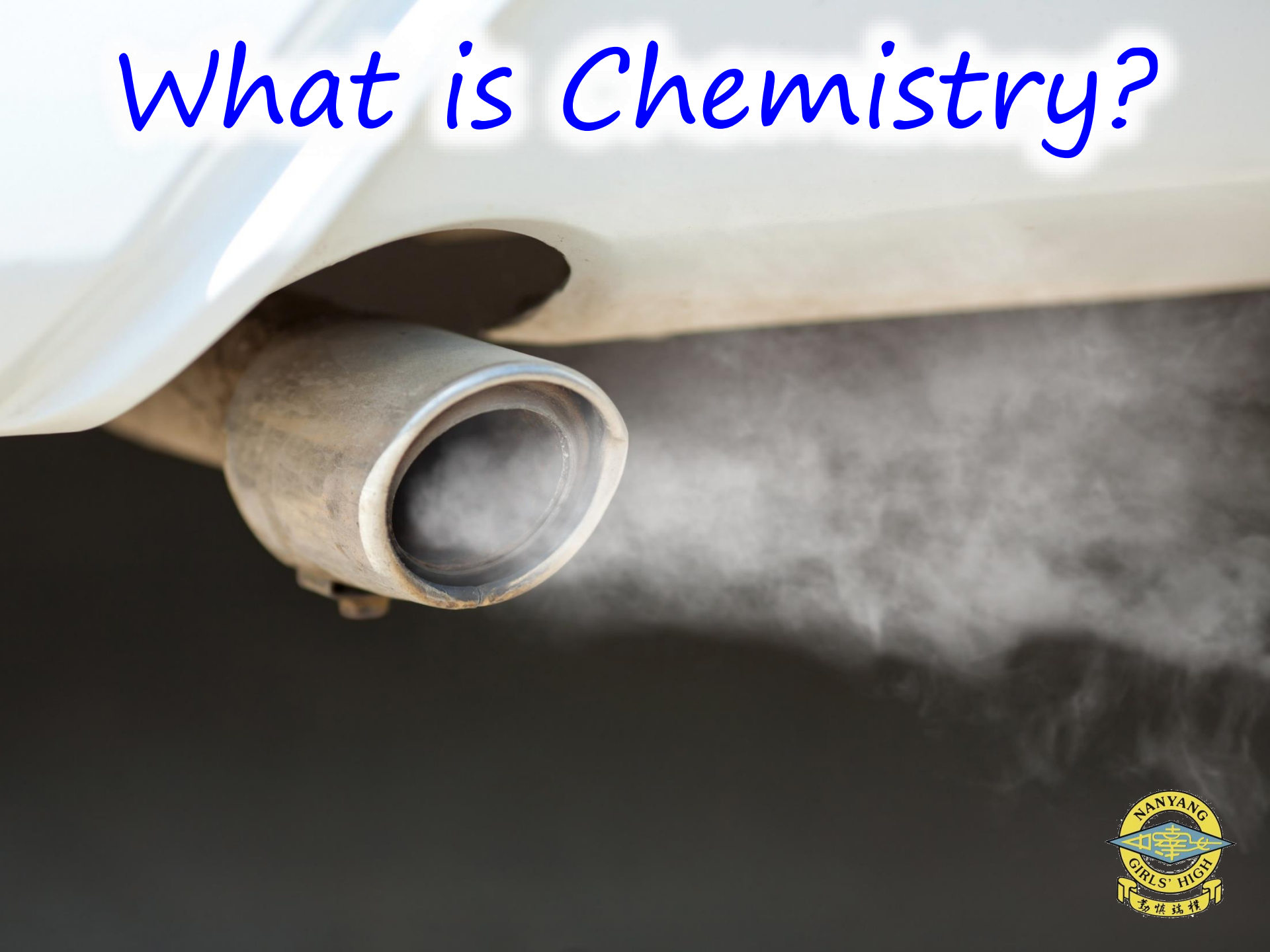


What is Chemistry?

Does Chemistry have a moral responsibility to serve society?



What is Chemistry?



What is Chemistry?

Is Chemistry always beneficial?



What is Chemistry?



What is Chemistry?

Can Chemistry always be controlled / regulated?



What is Chemistry?



What is Chemistry?

Will Chemistry ever fully
understand life, the universe
and everything?

The answer is up to you.

Problem: We don't know what
we don't know.

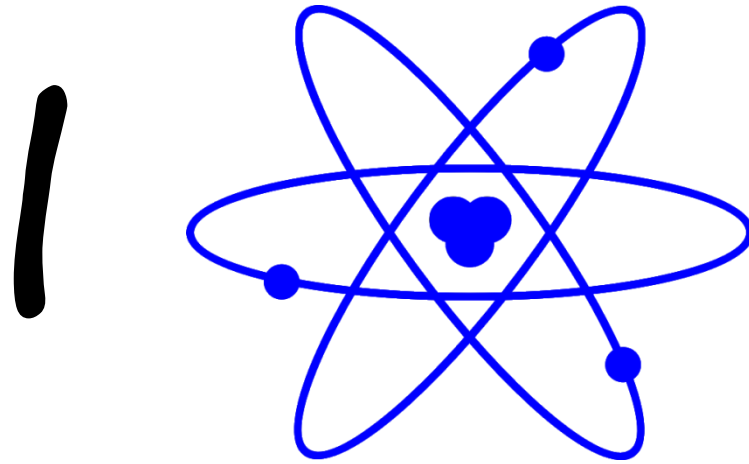


What is Chemistry?

...

That's
Chemistry!



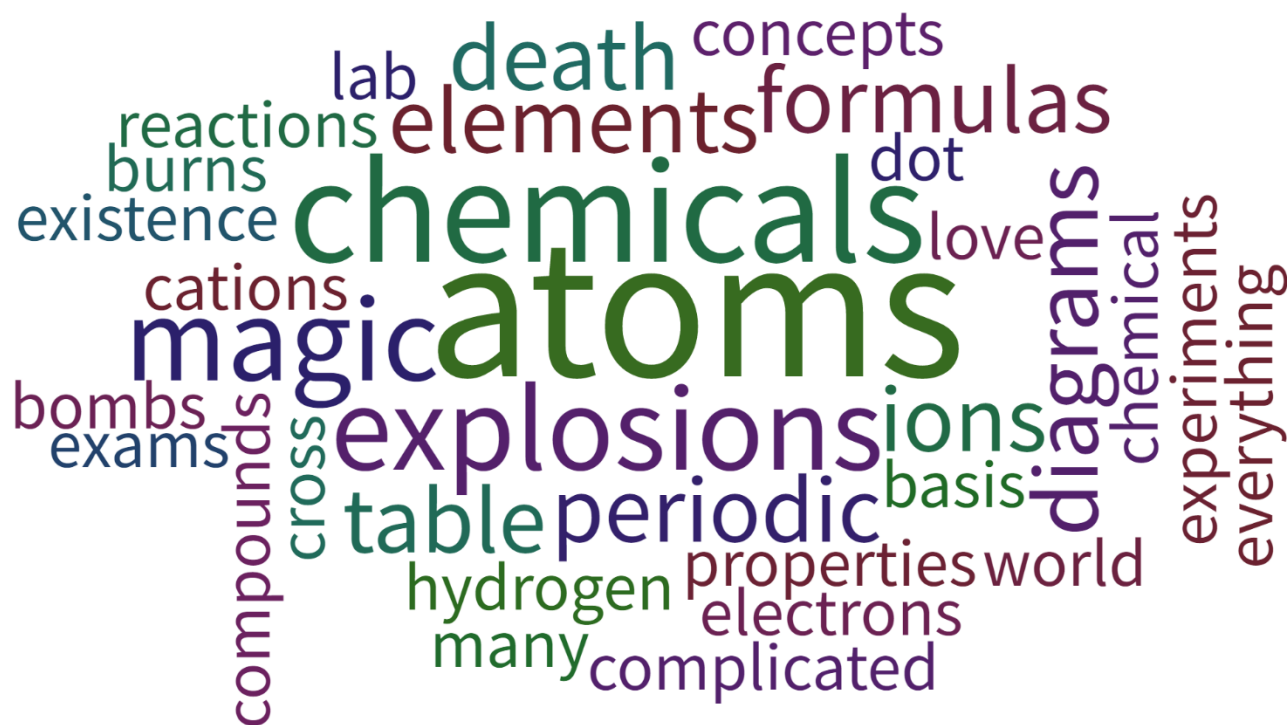


Chemistry



S3-11: What springs to mind when someone talks to you about "Chemistry"?

i Poll is full and no longer accepting responses



S3-11 Reflection: What do you think about "Chemistry" now?

i Poll is full and no longer accepting responses



What is Chemistry?

- Greed. Greed inspired humanity to embark on an extraordinary journey that touches everyone today. The particular variety of greed was jointly the quest for immortality and the attainment of unbound riches. The supposed route to both was the manipulation of matter to provide elixirs to overcome bodily ills for the realisation of immortality and recipes for the conversion of more or less anything resembling gold – either in colour, such as urine and sand, or weight, as in lead – into gold itself. Neither aim was ever achieved, but the ceaseless tinkering with matter by the alchemists provided them with a considerable familiarity with it and provided the foundation from which a real science – Chemistry – was to emerge.

Professor Peter W. Atkins



What is Chemistry?

- Humans are socially elaborate organisms that like to build things. We fabricate artefacts. We mine the stone of the Earth, pump the fluids from the deep, and harvest the gases of the skies and aim to turn all this raw material into whatever we desire. The conversion of those raw materials into substances that can be moulded, hammered, spun, glued together, eaten or simply burned, is part of Chemistry. Chemists have taken the raw materials provide by nature and manipulated them to provide the infrastructure of our modern technological society, thereby making a huge contribution to world economics as well as the development of both individuals and nations.

Professor Peter W. Atkins



What is Chemistry?

- There are of course speckles and blotches of black amid all the light. Chemistry has certainly contributed to mankind's ability to maim and kill – developing explosives and chemical weapons. In addition – through pollution of the air, land and water – Chemistry can also be seen to have a negative impact on our fragile environment. But imagine a world without Chemistry. Imagine a world where all of Chemistry's contributions to humanity are eliminated. This would instantly take us back to the painful, dangerous and uncomfortable era of the Stone Age.

Professor Peter W. Atkins



What is Chemistry?

Presentation on *What is Chemistry*
by Dr. Chris Slatter
christopher_john_slatter@nygh.edu.sg

