Crystallography - Teacher's Notes

Crystallography is a technique employed in all of the major scientific disciplines, so there are examples of applied science for biology, chemistry and physics students.

STFC, the BCA and Diamond have a range of educational resources aimed at students which help to bring this fascinating subject to life.

Find out more

Information on visits to STFC facilities including ISIS neutron and Muon Source is also available from the STFC site.

Diamond: Diamond Light Source has a range of resources for teaching available including videos, worksheets and information on visits to the facility.

BCA: Resources for teaching from the BCA are now available.

Try this in the classroom

The Nuffield Foundation have fantastic ideas for experiments and classroom activities for chemists and physicists.

If you enjoyed growing lysozyme crystals, this article in Science in School explains how to repeat in school, with information on sourcing reagents.

Make molecular models using plans and diagrams available.

Watch an animation of a diffraction experiment.

Watch a range of videos on STFC facilities.

Listen to podcast Diamond's science.

ISIS Pulsed Muon and Neutron Source

The ISIS pulsed neutron and muon source at the Rutherford Appleton Laboratory in Oxfordshire is a world-leading centre for research in the physical and life sciences. It is owned and operated by the Science and Technology Facilities Council.

ISIS produces beams of neutrons and muons that allow scientists to study materials at the atomic level using a suite of instruments, often described as 'super-microscopes'. By scattering neutrons off sample materials, scientists can visualise the positions and motions of atoms and make discoveries that have the potential to affect almost every aspect of our lives.

ISIS plays a vital role in the portfolio of analysis techniques used by researchers for areas as varied as energy, nanotechnology, materials processing, drug design and pharmaceuticals, bio-technology and green technology for a clean environment. Examples include studies of:

- hydrogen absorption in new materials designed for hydrogen storage and clean energy

- the structure of chemical polymorphs in pharmaceutical compounds
- the breakdown of environmental contamination by natural enzymes
- disordered materials, glasses and liquids - central to optical communication
- bio-compatible materials for healthcare
- waste storage and management

ISIS supports a national and international community of more than 2000 scientists who use neutrons and muons for research in physics, chemistry, materials science, geology, engineering and biology. It is the most productive research centre of its type in the world.

Useful links:

The British Crystallographic Association

The British Crystallographic Association, formed in 1982 is the UK national association for this important science (see the association's statutes and by-laws).

Crystallography is a vital part of much modern research into the structure and properties of materials ranging across the scientific fields of Chemistry, Biology, Physics, Materials science and Engineering.

With over 700 members representing the huge academic and industrial effort in crystallography in this country, the BCA has as its prime aims the promotion of crystallography in research and the education of young people and others in the methods, possibilities and achievements of crystallographic science.

Resources for teaching from the BCA 

Diamond Light Source

Diamond Light Source is the UK's national synchrotron facility, located at the Harwell Science and Innovation Campus in Oxfordshire. By accelerating electrons to near light-speed, Diamond generates brilliant beams of light from infra-red to X-rays which are used for academic and industry research.

Over 2000 researchers every year use Diamond's beamlines to conduct experiments in a wide range of disciplines including structural biology, health and medicine, solid-state physics, materials & magnetism, nanoscience, electronics, earth & environmental sciences, chemistry, cultural heritage, energy and engineering.

Diamond is a not-for-profit limited company funded as a joint venture by the UK Government through the Science & Technology Facilities Council (STFC) in partnership with the Wellcome Trust.

Diamond has extensive resources for teaching with animations, simulations and linked teaching sheets available. 

Our dedicated public site is available.