

CONDENSED MATTER PHYSICS

KS 2 Pupils (7-11) KS3, KS4

Aim: pupils will understand what condensed matter, in particular what condensed means and what matter refers to. They will understand what a crystal is, how atoms are arranged in a solid, which forces hold them together (ionic and covalent bonds). They will understand how can we “see” inside solids with the help of neutron scattering and X-ray crystallography and carry out a group activity in which they will reproduce some crystal structures with sticks and marshmallows (or other spherical objects of choice)

Resources: powerpoint slides, sticks and marshmallows.

slide	topic	description	time
1	introduction	what is condensed matter	5'
4	atoms in solids	describing what a crystal is, what holds atoms together, periodic table	10'
8	unit cell and lattice	explaining how atoms are arranged in the crystal	10'
10	how can we see inside solids	discussion	5'
11	neutron scattering	describing neutron scattering	5'
14	X-Ray crystallography	describing X-Ray crystallography and comparing it to neutron scattering	5'
16	group activity	recreate a type of crystal with other pupils using sticks and marshmallows	15'
17	conclusions and reflections	what have we learnt today	5'