

# SCIENCE – EXCEED AND EXCEL

## Biology

The GCSE is based on a series of topics related to the living world and relevant to students. It is designed to help them understand how Science can be used to explain the world in which they live and the impact humans have.

Students can see how science is used to solve problems ranging from infectious diseases to creating biofuels.

Biology is suitable, whether you intend further study in Science or not. It can open the doors to future careers in Medicine and the Life Sciences.

Below is a range of fun educational experiments to try at home:

[http://homepage.eircom.net/~kogrange/light\\_experiments1.html](http://homepage.eircom.net/~kogrange/light_experiments1.html)

[http://homepage.eircom.net/~kogrange/sound\\_experiments.html](http://homepage.eircom.net/~kogrange/sound_experiments.html)

<http://www.stevespanglerscience.com/experiments/12>

## Chemistry

Many of the materials considered in Chemistry, are substances that your child will come across in their daily lives like drinking water, vegetable oils and metals. This helps engage students by putting their learning in context.

Chemistry can open the doors to future careers in Medicine and the Chemical Industry

Look at the science behind the weather, especially the changes of physical state that occur in rain, snow and hail.

Look at the development of the periodic table, especially the work of Mendeleev (several variants on spelling)

Pick an element off the periodic table and investigate when and how it was discovered

How are elements being discovered at the moment?

Look around the science in your house: Investigate how water filters work; find out how cooker hoods remove unwanted cooking smells or smoke; cook a recipe that involves heating in some way (chemical change), compare with recipes that just involve mixing (physical change)

Discuss the use of fuels in the world and the problems we face in the future

Look at the science behind global warming

## Physics

Students are likely to be engaged by the aspects of physics that they can relate to their everyday life such as the efficiency of electrical appliances and braking distances as well as larger concepts like nuclear fission and fusion and evidence of the Big Bang.

Physics is suitable, whether you intend further study in Science or not. It can open the doors to future careers in Medicine and the many aspects of Engineering

Develop mathematical skills will support understanding as will getting your child to question the science behind everything

### Wider Recommended Reading

- 'Frightening Light, Killer Energy or Shocking Electricity (Horrible Science)' by Nick Arnold
- 'Fatal Forces (Horrible Science)' by Nick Arnold
- 'Wonders of the Solar System', 'Wonders of the Universe', 'Wonders of Life' all by Brian Cox
- 'Women in Science – 50 fearless pioneers who changed the world' by Rachel Ignatofsky
- 'A Brief History of Nearly Everything' by Bill Bryson
- 'Frankenstein' by Mary Shelley
- 'Brave New World' Aldous Huxley
- '1984' George Orwell
- 'I, Robot' Isaac Asimov
- 'The Day of the Triffids' John Wyndham
- 'The Time Machine' H G Wells

### Television, Radio and Podcasts

- Brainiac
- The Living Planet
- How Stuff Works
- Springwatch
- Autumnwatch
- Stargazing Live
- Big Bang Theory
- Chemistry: A volatile history C4
- The Lost World and Jurassic Park

### Places to Visit

- Visit any nature reserve – Martin Mere
- Back garden observations
- Visit RHS Tatton to look at the diversity of plants and their different adaptations
- Take part in the RSPB bird watch in January
- MOSI
- Jodrell Bank

Hack Green Secret Nuclear Bunker

Magna Museum, Yorkshire

The Ministry of Science Live, The Lowry, Salford

Cambridge Science Festival in March

MAD Museum – Mechanical Art and Design Museum in Warwickshire

Techniquest in Cardiff

CAT Centre for Alternative Technology Snowdon, Wales

## Websites

[www.bbc.co.uk](http://www.bbc.co.uk)

[www.horrible-science.co.uk](http://www.horrible-science.co.uk)

[www.newscientist.com](http://www.newscientist.com)

<http://www.docbrown.info/ks3science.htm>

<http://www.planet-science.com>

<http://www.ingenious.org.uk>

[www.fourmilab.ch/earthview](http://www.fourmilab.ch/earthview)

<http://www.schoolsobservatory.org.uk>

[www.nineplanets.org](http://www.nineplanets.org)

<http://www.bbc.co.uk/science/space/solarsystem>

[www.furryelephant.com](http://www.furryelephant.com)

[www.energyquest.ca.gov](http://www.energyquest.ca.gov)

<http://resources.schoolscience.co.uk>

<http://www.innerbody.com/htm/body.html>

<http://www.factsoflife.org.uk>

<http://www.rspb.org.uk/birdwatch/takepart>

<http://www.physicsclassroom.com/>

<http://www.schoolphysics.co.uk/>

<http://www.Physics.org>

[www.cyberphysics.co.uk/index.html](http://www.cyberphysics.co.uk/index.html)

## Extracurricular and competitions

The Big Bang North Fair

Peterhouse Kelvin Science Prize

Pembroke Essay Prize – Science

Y12 Corpus Cristi William Briggs Science Prize

Y12 Corpus Cristi Oliver Rackham prize for biological science

Harry and Margaret Kroto Prize for innovative use of technology in Science Learning

The Woodland trust offers weekly challenges to members

<http://www.woodlandtrust.org.uk/naturedetectives/>

Science Club

STEM Club