SUMMER SCIENCE EXHIBITION 2019

A guide for teachers

Here you will find a brief description of each exhibit and the key subjects covered by the research. You will also find some curriculum-linked key words to help map the topics to your schemes of work at KS4 and KS5.

The Exhibition provides the opportunity to bring the latest research into your classroom. Think about how this research can be used in your lessons. Which exhibits will be of particular interest to your individual students? If you are visiting the exhibition encourage your students to prepare questions for the scientists in advance.

Take a look at the exhibits in more detail at **royalsociety.org/summer-exhibits**

THE ROYAL SOCIETY

First floor – Wolfson Rooms

1. In your element
University of Warwick

Celebrate the 150th anniversary of the periodic table with an investigation into the elements that are essential for life.

Chemistry | Biology

Keywords: Deficiency | Environment | Essential elements | Evolution | Microbial disease | Precious metal

2. A recipe for primordial life
UKRI - MRC Laboratory of Molecular Biology

Dive into the primordial soup to reveal the fundamental building blocks of life.

Biology | Chemistry | Maths

Keywords: Atmosphere | Biomolecule | Genome | Informatics | Primordial

3. The great Bristol shake off
University of Bristol

Shake, shake, shake those fake earthquake tremors to help safeguard our nuclear reactors against natural disasters.

Chemistry | Physics | Maths | Computing

Keywords: Advanced gas-cooled reactors | Graphite | Infrastructure | Seismic

4. It's a knockout
Royal Veterinary College

Explore how tuberculosis is becoming a disease of the past through the use of genetic technologies.

Biology | Maths

Keywords: Bovine | Endemic | Gene | Mycobacteria | Pathogen | Resistance | Tuberculosis (TB) | Vaccine | Zoonosis

5. Surface matters
Cardiff University

Detect how changes on the surface of materials can dramatically alter their properties.

Chemistry | Physics

Keywords: Catalyst | Photoelectron | Spectroscopy | Superconductor | Surface atoms

First floor – Council Room

6. Lighting the brain after birth
University College London (UCL)

Glimpse how light can be used to monitor the brain activity of babies and even save the lives of newborn infants.

Biology | Physics | Maths | Computing

Keywords: Biomarker | Near Infra-Red Spectroscopy (NIRS) | Intensive care unit (ICU) | Neurological | Physiology

SUMMER SCIENCE EXHIBITION 2019

7.BepiColombo: x-ray eyes on Mercury
University of Leicester

Voyage to this mysterious and uncharted planet and explore how its secrets are being revealed using x-ray imaging.

Physics Maths Computing

Keywords: Night-side Orbit Planets Observational data Solar system Sun Volatile X-ray spectrometer

8. Molecular music: the sound of chemistry
Ilkley Grammar School / University of Bradford

Join Ilkley Grammar School as they create musical masterpieces to show what's happening in a chemical reaction.

Chemistry Physics Maths

Keywords: Bond Frequency Infrared Spectroscopy (IR) Vibration

Ground floor – City of London Rooms

9. Green light for chemistry
University Of Nottingham

Find out how light can be used as a clean, green alternative to chemicals in manufacturing methods.

Chemistry Maths Biology

Keywords: Artemisinin Malaria Manufacture Reactor Reagent Toxic

10.Magnetic to the core
University of Liverpool

Discover what the Earth's ancient magnetic field tells us about the hidden depths of our planet.

Physics Maths

Keywords: Convection Geodynamo Magnetic field Navigation Palaeomagnetism Space weather

11. Breathing with your brain
University of Oxford

Why do we get breathless? Explore how and why the brain can influence the breathing process.

Biology Physics Maths

Keywords: Brain Networks Breathlessness Chronic lung condition Magnetic resonance imaging (MRI)

12. Do you feel me?
Goldsmiths, University of London

Discover how words can have a taste and sounds have a colour for people with synaesthesia, a condition that blends the senses.

Biology Maths

Keywords: Mirror-sensory Perception Synaesthesia Sensory modality

13. Seeing with atoms
University of Cambridge

See how helium can be used in microscopy to open a new world of discovery.

Biology Physics Maths

Keywords: Denticle Scanning helium microscope (SHeM) Surface trichrime Taxonomic

14. Living on the Moon
Open University

Prepare for the next big lunar challenge, 50 years after the historic Apollo 11 Moon landing.

Chemistry Physics Maths

Keywords: 3D printing Lunar Prospecting

SUMMER SCIENCE EXHIBITION 2019

Ground floor – Wellcome Trust Lecture Hall

15. Timber towers of tomorrow
University of Cambridge

Explore the science and engineering of super tall timber, from the smallest of cells to the highest of skyscrapers.

Biology Chemistry Maths

Keywords: Architecture Interdisciplinary Materials Natural Plant biochemistry Structure Sustainable

16. A message from afar
University of St Andrews

Join the debate on whether we should try to communicate with extra-terrestrial civilisations.

Biology Physics Maths

Keywords: Extra-terrestrial Intelligence Interstellar Radio technology

17.Take a bite out of climate change
University of Manchester

Uncover the surprising truths about what we eat in this myth-busting look at the food on our plate, and how it gets there.

Biology Chemistry

Keywords: Climate change Diet Environmental sustainability Greenhouse gas

18. Art of isolation
Lancaster University

Is the quietest place in the Universe really next to the M6? Investigate how the removal of ‘noise’ is enabling the development of brand new technology.

Chemistry Physics Maths Biology

Keywords: Graphene Green energy Quantum Optical device Thermal noise

19.Trusted autonomous vehicles
University of Leicester

Would you trust a driverless car? Put your views to the test and see what it takes to establish trust in this up and coming technology.

Physics Maths Computing

Keywords: Artificial intelligence (AI) Automotive Autonomous vehicle Informatics Machine learning Societal impact

20. The mathematics of cancer
University College London (UCL)

In the search for a cure for cancer, see how mathematical modelling is providing valuable insight into the complex structures of tumours.

Biology Physics Maths Computing

Keywords: Biomedical imaging Cancer Computational modelling Side effects Substrate Resistance Tumour

21.Robots in the danger zone
Heriot-Watt University

Meet the real-world robots unlocking new possibilities in areas too hazardous for humans to work.

Physics Maths Computing

Keywords: Dangerous environments Human robotic interaction (HRI) Robotics

22. Super biomaterials to fight superbugs
University Of Nottingham

Discover the amazing materials helping to battle the rise of superbug infections in medical devices.

Biology Chemistry Maths

Keywords: Antimicrobial Bacterial adhesion Biofilm Superbug Surface coating