Summer Science Camps: 5 July -27 August 2021, daily from 9.30-3.30

Age-adjusted Content & Experiments for 4-7 and 8-12 years

Location: Holiday Inn Kensington Forum, Courtfield Road Entrance, London SW7 4DN (2 mins Gloucester Road Tube Station)

Week 1: Mon-Fri, 5-9 Jul 2021 | **The Scientific Story of the Universe: From the Big Bang to AI**
Week 2: Mon-Fri, 12-16 Jul 2021 | **Medical Science: Who wants to be a Doctor?**
Week 3: Mon-Fri, 19-23 Jul 2021 | **The Science of the Oceans**
Week 4: Mon-Fri, 26-30 Jul 2021 | **Meet the Elements – The Central Science of Chemistry**
Week 5: Mon-Fri, 2-6 Aug 2021 | **Science Giants and Innovators**
Week 6: Mon-Fri, 9-13 Aug 2021 | **Aerodynamics: When Biology meets Physics**
Week 7: Mon-Fri, 16-20 Aug 2021 | **The Wonders of Biology and Biomimicry**
Week 8: Mon-Fri, 23-27 Aug 2021 | **Engineering Design at Work!**

Week 1: 5-9 July 2021

The Scientific Story of the Universe: From the Big Bang to AI

Day 1

- How it all started: The Big Bang.
- Lost in space: Explore the universe and galaxies.
- Black holes and strange stars.
- How stars are born.
- Fritz Zwicky and amazing supernovae.
- The Sun: our own star!

Day 2

- Our Solar System and visitors from deep space.
- Planet Earth: The Goldilocks Planet.
- Looking for fossils and Dinosaur Hunters.
- Mary Anning's excavations.

Day 3

- Rocks and how they change.
- The Fire Below: volcanoes.
- Plate Tectonics and Richter Scale.
- What is air?
- Hot and Cold: How temperature affects the atmosphere.
- Extreme Weather and the life cycle of a raindrop.

Day 4

- Microorganisms: The Dawn of Life on Earth.
- Wonderful cells!
- How life came out of the sea.
- DNA: The amazing recipe book of life and how it was discovered.
- Homo sapiens: Where did we come from?

Day 5

The Anthropocene:

- Ecosystems and environmental engineering.
- Climate Change: Arctic and Antarctic challenge.
- Reaching the stars: rockets and space missions.
- Can we fly faster? Forces, speed of sounds, speed of light.
- Artificial Intelligence – Machines that can learn!

Week 2: 12-16 July 2021

Medical Science: Who wants to be a Doctor?

Day 1

- The History of Medicine.
- The anatomy of our vital organs.
- The body's systems.
- Bio-machinery: muscles, tendons, and the skeleton

Day 2

- How doctors see inside us: Medical Imaging
- Our incredible Nervous System
- Amazing Brains
- Vision and how our eyes play tricks on us.

Day 3

- The Digestive System and our miraculous micro-biome.
- An apple a day: What makes certain foods healthy?
- What are humans made from? The chemistry of life.
- Medicines from Nature!

Day 4

- The Circulatory System: Heart and blood.
- The army inside us: Our Immune System.
- Curing disease with the power of genetics.
- What are Pathogens?
- John Snow and Germ Theory

Day 5

- How we are winning the fight against germs: Alexander Fleming and Mary Hunt
- Viruses and vaccines: Edward Jenner
- How the deadliest creature in the world might just save us all.
- The future of medicine: will we one day live forever

Week 3: 19-23 July 2021

The Science of the Oceans

Day 1

- Introduction to the Oceans and its zones.
- Why is the ocean salty?
- Who wants to be a Marine Biologist?
- Mysterious Hydrothermal Vents.

Day 2

- The Deep Ocean and incredible recent discoveries!
- Bioluminescence and how it works.
- Squids, Octopuses, and Cuttlefish.
- How fish breathe.
- The wonderful world of sharks.

Day 3

- Frozen Oceans and life under and above the ice.
- Nutrient and water cycles in the ocean.
- Amazing Jellyfish.
- Whales, dolphins, and echolocation.

Day 4

- Oceanic Currents.
- The science of waves and how they shape the world.
- Whales, dolphins, and echolocation. (webinar only)
- Mighty kelp forests and their importance to life on Earth.
- The world of Sea Turtles.

Day 5

- Ocean Conservation.
- How pollution and plastic affects marine life.
- Fascinating Corals and symbiosis.
- Oceanic Food chains.

Week 4: 26-30 July 2021

Meet the Elements – The Central Science of Chemistry

Day 1

- What is Chemistry? From the first Alchemists to modern Chemists.
- What is the matter? Incredible atoms and the periodic table.
- The properties of matter – amazing materials of the future! (webinar only)
- Hydrogen and Helium: The Universe's first elements.
- Chemical bonding: How the elements interact.

Day 2

- What is a chemical?
- Explosive chemical reactions and amazing physical changes.
- What are the states of matter? From the coldest condensates to the hottest plasmas.
- The properties of matter – amazing materials of the future!
- Non-Newtonian liquids that break all the rules!

Day 3

- The power of Hydrogen: Corrosive Acids and Caustic Alkalis.
- The magic of Water, and its evil twin, Hydrogen Peroxide.
- The Element of Life: Adventures with Carbon.
- Can you freeze a gas? Experiments with Carbon Dioxide.
- Radioactive! Marie Curie and the most dangerous elements.

Day 4

- Heavy Metal: The metallic elements and their properties.
- The superpowers of Iron and Copper.
- Dazzling polymers and how to make them!
- Plastic and Paper: Recycle, Reuse, and Reduce!

Day 5

- What is density? Can you stack liquids?
- The elements in your body!
- Dorothy Hodgkin and the beautiful world of crystals.
- Experiments with Chromatography- the chemistry of colour.

Week 5: 2-6 August 2021

Science Giants and Innovators

Day 1

- Galileo Galilei, Nicolaus Copernicus, and the search for truth
- Robert Hook and the miraculous microorganisms
- Katherine Jonson and the Rocket Science
- Leonard da Vinci and the secret of flight

Day 2

- Fibonacci or the Secrets of Maths in Nature
- Alessandro Volta and the first battery
- Stephen Hawking and the Black Holes
- Franklin, Crick and Watson and the secret of DNA

Day 3

- Elon Mask or Can we Colonise Mars?
- Charles Darwin and the survival of the fittest
- Kingdom Brunel and his big engineering dreams
- Misa Meitner and the life of Atoms

Day 4

- The story of Benjamin Franklin
- James Lovelock and his GAIA Theory
- Dorothy Hodgkin and the world of crystals
- Mary Anning and the story of Dinosaurs

Day 5

- James Goodall and the Great Apes
- The Curies and the Science of Radioactivity
- Edmond Halley, Comets, Asteroids, and other Cosmic Rocks
- Isaac Newton and his Laws of Motion and Optics

Week 6: 9-13 August 2021
Aerodynamics: When Biology meets Physics

Day 1

- The Evolution of Flight in the Animal World: Wings, Sizes and Shapes
- Leonardo da Vinci and his flying machines
- Forces and why are they important?
- Who was Isaac Newton and what are the three laws of motion?

Day 2

- Leonardo da Vinci and the Dream of Birdmen
- The science behind hot air balloons
- How Wright Brothers follow their dream and the brave Amelia Earhart
- What are the best shapes for a plane?

Day 3

- The Forces in Flying Regimes of Flight
- The Science Behind Hovercars and Crafts
- How do Helicopters Fly?
- Exploration of Venus

Day 4

- Rockets and Space Exploration
- The Anatomy of the Rockets
- Rockets vs airplanes
- Space X, Reusable Rockets and Colonisation of Mars

Day 5

- The physics of sound
- What are waves?
- What is echolocation?
- The invention of the telephone and how this changed us

Week 7: 16-20 August 2021
The Wonders of Biology and Biomimicry

Day 1

- Carl Linnaeus and the Animal Kingdom
- The World of Reptiles
- Charles Darwin and his discoveries
- Biomes and Habitats: form desert to arctic
- Adaptation and Evolution, do we still evolve?

Day 2

- Magnificent Plants: Plants' structure
- What is chlorophyll and why it is important
- Gregor Mendel and the experiments with Plants
- Why do we need to keep the planet green?
- Carbon Footprint and Why It Is vital

Day 3

- Biology of Oceans
- Intelligent Creature of the Oceans: Octopuses and Whales
- Amphibians and Why we Should Protect Them
- Green Engineering and how to keep the Oceans Clean

Day 4

- The world of insects
- Imagine a World Without Bees
- The miraculous life if butterflies
- The Amazing World of Spiders
- Introduction and Neuroscience: our amazing brain

Day 5

- Micro Biology: Fungi are around us
- Bacteria and their amazing lives
- Vegetable and Animals Cells: are we different?
- What is DNA or can we design animals?

Week 8: 23-27 August 2021
Engineering Design at Work!

Day 1

- Engineering and Problem Solving
- How Simple Machines Changed our Life
- Cogs and Wheels
- The invention of Cars

Day 2

- Leonardo Da Vinci, catapults, and divers
- How do Submarine Work?
- How do we Build Dams and Why We Need Them?
- The challenge of building tall towers

Day 3

- Investigate Bridges and Tunnels
- Kingdom Brunel and his big engineering dreams
- Property of materials
- Friction and Resistance

Day 4

- Margaret Hamilton and the Apollo Mission
- The science of reusable rockets
- The invention of the Telephone
- Stephenson and the first railways

Day 5

- The Introduction in Artificial Intelligence
- Amazing new Materials
- Engineered by Nature
- Maths in Nature