



## Summer Camp Programmes 2019

Daily Monday-Friday, 9.30-3.30 (8.45am free early drop-off), 4-7 and 8-12 years  
(age adjusted & separated groups)

- The Academy, Holiday Inn London Kensington Forum, entrance Courtfield Road, London SW7 4DN, (with secure outdoor space for breaks), 2 mins from Gloucester Road tube station
- Swiss Cottage Library, 88 Avenue Road, London NW3 3HA

<b>8-12 July</b>	<b>Journey to the Centre of Biology: From the Mini World of Bacteria to Humans</b>
<b>15-19 July</b>	<b>Think Physics: Newton, Volta, Einstein and Quantum Physics</b>
<b>22-26 July</b>	<b>When Science meets Architecture: Shapes, Materials and the Cities of Future</b>
<b>29 Jul-2 Aug</b>	<b>Astrogeology: Exploration on Earth, Planets, Moons, Asteroids, Comets and Meteorites</b>
<b>5-9 Aug</b>	<b>The Science of Seas and Oceans: Whales, Sharks, Rays and much more!</b>
<b>12-16 Aug</b>	<b>Engineered! The Journey from Wheels to Rocket Engines</b>
<b>19-23 Aug</b>	<b>Science Geniuses: Great and fearless Men &amp; Women in Science who changed the World?</b>
<b>27-30 Aug</b>	<b>Biochemistry: Molecules and Elements and how they work</b>
<b>2-4 Sep</b>	<b>Fascinating Zoology: Animals and Ecosystems</b>

### SUMMER CAMP WEEK 1: Journey to the Centre of Biology: From the Mini World of Bacteria to Humans Monday to Friday, 8-12 July 2019

#### Day 1:

- From amoeba to humans
- The life of the cell: the perfect mini factory
- The secret of mitochondria
- Lynn Margulis and symbiosis

#### Day 2:

- Robert Hook and the invention of the microscope
- Viruses: are aliens leaving amongst us?
- Microorganisms and their importance
- What is vaccination and why we need it?
- Who was Edward Jenner?

#### Day 3:

- What are nutrients?
- Digestive Ride
- Respiratory system in humans and animals
- Five senses

#### Day 4:

- What is calcium: skeletons and teeth
- Hearing and Vision in the animal world
- Why our brain is so special

#### Day 5:

- What is Marine Biology?
- Eugenie Clark and her sharks
- All about Jellyfish
- Veterinary or who wants to be a Vet?

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## **SUMMER CAMP WEEK 2: Think Physics: Newton, Volta, Einstein and Quantum Physics**

**Monday to Friday, 15 -19 July 2019**

### **Day 1:**

- What are forces?
- Isaac Newton and the Newtonian Laws
- What is energy
- State of matter
- Density and the property of materials

### **Day 2:**

- What is Gravity and its effect in our universe?
- I, Galileo Galilei
- Leonardo and the science of flight
- Rocket Science and how far can we get?

### **Day 3:**

- Electromagnetisms and Light
- Electricity and Circuits
- Alexander Volta and the invention of the battery
- Green Energy and New materials

### **Day 4:**

- Introduction in Particle Physics
- Strange Atoms
- Weak and Strong Forces
- The life of Stars
- Stephen Howking and the mystery of Black Holes
- Is Time Travel Possible?

### **Day 5:**

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



## **SUMMER CAMP WEEK 3: When Science Meets Architecture: Shapes, Materials and the Cities of Future**

**Monday to Friday, 22-26 July 2019**

### **Day 1:**

- Engineers or Architects?
- Architectural Landmarks
- Egyptian Pyramids, The Coliseum and The Duomo
- Properties of Materials

### **Day 2:**

- The invention of the simple machines
- How the wheel changed the world
- The science of force in bridges
- Let's build columns
- Beams, Vaults and Arches

### **Day 3:**

- Who was Antonio Gaudi?
- Diversity of Houses
- Introduction to Towers
- Norman Foster and his buildings

### **Day 4:**

- Who wants to be an engineer?
- Kingdom Brunel and his legacy
- Naval Architecture: Liners, Hovercrafts, and submarines
- Animal Architects

### **Day 5:**

- Zaha Hadid and other architects arrived from the future
- How climate affects Architecture
- Sustainable Architecture
- Design your own home



## **SUMMER CAMP WEEK 4: Astrogeology: Exploration on Earth, other Planets, Moons, Asteroids, Comets and Meteorites**

**Monday to Friday, 29 July -2 Aug 2019**

### **Day 1:**

- What is beneath our feet?
- Welcome to Earth: size, shape, spin and age
- How Henry Cavendish, Isaac Newton, Edmond Halley and Charles Lyell helped answer some important questions.
- How do scientists know what is inside the Earth?
- **Inge Lehman**: the geologist who discovered Earth's deepest secret

### **Day 2:**

- Rocks and Minerals
- Exploration of Crystals
- Who wants to be a volcanologists?
- The science behind earthquakes
- Plate Tectonics and Richter Scale

### **Day 3:**

- What is astrogeology?
- Our closest neighbour, the Moon
- Our Solar family of rocky planets: Mercury, Venus, Mars
- Can we colonise Mars?

### **Day 4:**

- Moons, Comets, Meteorites and other rocks in the space
- Rosetta Project
- The hidden world beneath the Antarctic Ice Sheet
- Exoplanets and how we look for them

### **Day 5:**

- Soil and the Microorganisms
- Erosion, rains and winds
- What is the shape of the ocean floor?
- Rachel Carson and what she did for our planet



## **SUMMER CAMP Week 5: Science of the Oceans: Whales, Sharks, Rays and much more**

**Monday to Friday, 5-9 August 2019**

### **Day 1:**

- Intro to oceans and the its zones
- Why are the oceans salty?
- Who wants to be a Marine Biologist?
- The origins of life in the oceans

### **Day 2:**

- Deep ocean and its habitants
- Bioluminescence and how it works
- Squids and octopuses
- How fish breath
- The wonderful world of sharks

### **Day 3:**

- Frozen Oceans and life under and above the ice
- Water cycles
- Amazing Jellyfish
- Whale, dolphins and echolocation

### **Day 4:**

- Oceanic currents
- The science of waves
- Let's Study kelp forests
- The world of sea turtles

### **Day 5:**

- Ocean conservation
- How prolusions affect animals
- Fascinating corals
- Oceanic food chains
- The chemistry of H<sub>2</sub>O



## **SUMMER CAMP WEEK 6: Engineered! The Journey from Wheels to Rocket Engines**

**Monday to Friday, 12-16 Aug 2019**

### **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 to build dams and why we need them
- The challenge of building tall tower
- How architectures work with the engineers

### **Day 3:**

- The physics of bridges
- How to build Tunnels
- Kingdom Brunel, the great engineer
- Property of materials

### **Day 4:**

- Elon Mask and the science of rockets
- Nickola Tesla and his Engendering projects
- The invention of the telephone
- Stephenson and the first railways

### **Day 5:**

- The introduction in Robotics
- Amazing new Materials
- Engineered by Nature
- Maths in Nature
- DNA and Bioengineering



## **SUMMER CAMP Week 7: Science Geniuses: Great and fearless Men & Women in Science who changed the World**

**Monday to Friday, 19-23 Aug 2019**

### **Day 1:**

- Franklin, Crick and Watson and the secret of DNA
- Stephen Hawking and the black holes
- Isaak Newton and his laws of motion and optics

### **Day 2:**

- Nicola Tesla and the giant thunder collector
- Katherine Jonson and the rocket science
- Archimedes and the crown challenge
- Mary Anning's fossils

### **Day 3:**

- Alessandro Volta and the first battery
- Robert Hook and the miraculous microorganisms
- How Edward Jenner, Alexander Fleming and Louis Pasteur saved the world
- Elon Mask and the exploration of Mars

### **Day 4:**

- Charles Darwin and the survival of the fittest
- Inge Lehman and the science of earthquakes
- Alfred Wegener and Pangea
- Rachel Carson or how to take care of our planet

### **Day 5:**

- Galileo Galilei, Nicolaus Copernicus and the search for truth
- Dorothy Hodgkin and the world of crystals
- Leonard da Vinci and the secret of flight
- Kingdom Brunel and his big engineering dreams



## Science Camp Week 8: Biochemistry: Molecules and Elements and how they work

Tuesday to Friday, 27-30 Aug 2019 (4 days)

### Day 1:

- What are atoms and molecules
- How Alchemy became Chemistry
- The quest for Elements
- Elements and Compounds
- The story of N<sub>2</sub>O

### Day 2:

- The State of Matter
- What is Density
- All about liquids and non-Newtonian Liquids
- The story of Hydrogen
- Property of materials and how new materials change our lives

### Day 3:

- The adventure of Carbon
- What are chemical reactions?
- Acids and Bases
- Temperature: heating and cooling down

### Day 4:

- Dissolving versus melting
- Reversible/ Irreversible Reactions
- The world of Crystals
- Marie Curie and her discoveries

### Day 5:

- The chemistry in our bodies
- Chromatography
- What is air made from?
- Water Cycle





## **SUMMER CAMP WEEK 9: Fascinating Zoology: Animals and Ecosystems**

**Monday to Wednesday 2-4 Sep 2019 (3 days)**

### **Day 1:**

- Zoology, diversity of the animal world
- Classifications: Vertebrates and invertebrates
- Skeletons vs exoskeletons
- Water Bears, amoebas and other extremophiles

### **Day 2:**

- Animal Superpowers
- Bats, Dolphins and echolocation
- Bees, snakes, shrimps and their amazing vision
- Octopuses and other masters of disguise

### **Day 3:**

- What are ecosystems?
- How do animals grow?
- Fantastic insects and why they are important?
- How birds Fly?