



Natural Science Branch

Through a series of entertaining and educational workshops, based on practical hands-on experiences, this course is designed to give an appreciation of how Natural Science contributes more and more to everyday applications, through the medium of Photography/Imaging and for pupils to gain an insight into a range of related careers. Each session incorporates facts and stories about the future of Natural Science.

Breakdown of Sessions for the Natural Science Workshops:

- Biology

Learning opportunities include:

- Aerobiology – the study of airborne organic particles
- Astrobiology (also known as exobiology, exopaleontology, and bioastronomy) – the study of evolution, distribution, and future of life in the universe
- Biochemistry – the study of the chemical reactions required for life to exist and function, usually a focus on the cellular level
- Bioengineering – the study of biology through the means of engineering with an emphasis on applied knowledge and especially related to biotechnology
- Bioinformatics – the use of information technology for the study, collection, and storage of genomic and other biological data
- Biotechnology – the study of the manipulation of living matter, including genetic modification and synthetic biology
- Cryobiology – the study of the effects of lower than normally preferred temperatures on living beings

- Genetics – the study of genes and heredity.
- Epigenetics – the study of heritable changes in gene expression or cellular phenotype caused by mechanisms other than changes in the underlying DNA sequence
- Zoology – the study of animals, including classification, physiology, development, and behavior, including:
 - Ethology – the study of animal behavior
 - Entomology – the study of insects
 - Herpetology – the study of reptiles and amphibians
 - Ichthyology – the study of fish
 - Mammalogy – the study of mammals
 - Ornithology – the study of birds
- Astronomy

Learning opportunities include:

- Astrobiology – studies the advent and evolution of biological systems in the universe
- Astrophysics – branch of astronomy that deals with the physics of the universe, including the physical properties of celestial objects, as well as their interactions and behavior. Among the objects studied are galaxies, stars, planets, exoplanets, the interstellar medium and the cosmic microwave background; and the properties examined include luminosity, density, temperature, and chemical composition.
- Earth Science

Learning opportunities include:

- Atmospheric Science
- Meteorology
- Climatology
- Paleoclimatology

- Atmospheric chemistry
- Atmospheric physics
- Environmental science
- Ecology – scientific study of the distribution and abundance of living organisms and how the distribution and abundance are affected by interactions between the organisms and their environment
- Oceanography
- Archaeology

Learning opportunities include:

- Field Survey – Above Ground
- Importance of the regional and site survey
- Observation tools
- Aerial Photography
- Remote Sensing
- The use of geophysics to read what's going on underground
- How electronics can help us
- Systematic Excavation
- Developing observation skills
- Persistence and care
- Geophysics

Learning opportunities include:

- Bio geophysics – study of how plants, microbial activity and other organisms alter geologic materials and affect geophysical signatures.
- Exploration geophysics – the use of surface methods to detect concentrations of ore minerals and hydrocarbons.
- Geophysical fluid dynamics – study of naturally occurring, large-scale flows on Earth and other planets.

- Geodesy – measurement and representation of the Earth, including its gravitational field.
- Geodynamics – study of modes of transport deformation within the Earth: rock deformation, mantle convection, heat flow, and lithosphere dynamics.
- Geomagnetism – study of the Earth's magnetic field, including its origin, telluric currents driven by the magnetic field, the Van Allen belts, and the interaction between the magnetosphere and the solar wind.
- Mathematical Geophysics – development and applications of mathematical methods and techniques for the solution of geophysical problems.
- Mineral Physics – science of materials that compose the interior of planets, particularly the Earth.
- Near-surface Geophysics – the use of geophysical methods to investigate small-scale features in the shallow (tens of meters) subsurface.
- Paleomagnetism – measurement of the orientation of the Earth's magnetic field over the geologic past.
- Seismology – study of the structure and composition of the Earth through seismic waves, and of surface deformations during earthquakes and seismic hazards.
- Tectonophysics – study of the physical processes that cause and result from plate tectonics.