Physics

Nature of Physics

Physics is the most fundamental of the experimental sciences, as it seeks to explain the universe itself from the very smallest particles—currently accepted as quarks, which may be truly fundamental—to the vast distances between galaxies. Despite the exciting and extraordinary development of ideas throughout the history of physics, certain aspects have remained unchanged. Observations remain essential to the very core of physics and models are developed to try to understand observations, and these themselves can become theories that attempt to explain the observations. At the school level both theory and experiments should be undertaken by all students. They should complement one another naturally, as they do in the wider scientific community. The Diploma Programme Physics course allows students to develop traditional practical skills and techniques and increase their abilities in the use of mathematics, which is the language of physics. It also allows students to develop interpersonal and digital communication skills which are essential in modern scientific endeavour and are important life-enhancing, transferable skills in their own right.1

Teaching Approach

As physics is an experimental science, students get to design and carry out investigations, collect data to analyse and come up with reasoned conclusions. The investigations may be laboratory based or they may make use of simulations and databases or combinations of these. Some of the research activities are individual efforts which builds skills in critical thinking, risk taking and inquiring whereas the group work develops teamwork and open-mindedness.

Students would have normally learnt the fundamentals of Physics in Year 10 before progressing into the course. They will study the following topics: Measurements, Mechanics, Thermal Physics, Waves, Electricity, Magnetism, Fields, Gravitation, Energy Production, Atomic, Nuclear and Particle Physics and Astrophysics.

Where does it lead to?

Studying Physics not only broadens our understanding of the universe and its operations but also provides opportunities to specialise into fields such as geophysics, field seismology, weather forecasting, teaching, mechanical and electrical engineering, research, astrophysics and film.

1 IB DP Physics Guide First assessment 2016. IBO, UK 2014.