STEM Physics

Course Description
STEM is a curriculum based on the idea of educating students in an interdisciplinary and applied approach using four disciplines - Science, Technology, Engineering, and Maths. This course allows students to explore these STEM subjects in innovative, interactive and engaging ways.

The course takes a project based learning approach to develop an increased awareness of the latest scientific and technological innovations. Students are encouraged to learn independently and are given the freedom to focus their own research. School trips are incorporated wherever possible, enabling students to apply their knowledge to a real life context. Students use models and simulations to make predictions relating to global issues, critically evaluating sources and data.

Specific lesson activities include:

- Design and manufacture an object which exhibits moving parts. The students present their design and try to market using a 'Dragons Den' approach. The class then builds the most popular design.
- Students produce a scale model of the sun, earth, and moon using maths scaling of large numbers.
- Students design, make and use a sundial to calculate the longitude of HK on earth, as well as the circumference of the earth using the sun's shadow.
- Students complete a Mechanical STEM extended essay on a topic of their students choice. Here there is a particular focus on effective research and accurate referencing.
- Students build model wind turbines and conduct investigations to establish factors that affect their efficiency.
- Students build their own solar cell and design their own investigations into their efficiency.
- Students research and present the most effective mobile phone currently on the market.
- Students use electromagnetic equipment to make a motor, then go one to modify this to produce something totally new.

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<td>Learning Outcomes
Group and individual presentations
Modeling ideas
Videos and podcasts
Document your work using a portfolio of evidence
Use of apps and computer software to collect, share and present data
Work individually and in groups to develop extended practical investigations</td>
<td>Compatible Courses

STEM education is becoming a global trend due to fast changing scientific and technological developments. The demand for skills in STEM subjects is growing in order to equip students to meet the challenges in our society with rapid economic, scientific and technological developments. This course allows students to explore STEM subjects using engaging and interactive project based approaches to learning.</td>
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<td>The 6 C’s
Creativity
Making predictions
Suggesting novel solutions to complex problems
Developing understanding of abstract scientific principles using models and simulations whilst considering</td>
<td>Future Study

You can study this course as well as IGCSE Physics; there is no overlap in content.

<u>This course is not designed to prepare students for IB Physics.</u> If students wish to study IB Physics, they are advised to study IGCSE Physics to provide</td>
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alternative perspectives and opposing arguments. ● Critical Thinking ○ Making connections and identifying patterns ○ Synthesis and interpretation of results and ideas ○ Application of learning ○ Collaborative knowledge construction ○ Experimenting, reflecting and taking action ● Communication ○ Coherent communication using a range of communication modes ○ Communication designed for particular audiences ○ Reflection on and use of the process of learning to further develop and improve communication ● Citizenship ○ A global perspective ○ Understanding of diverse values and worldviews ○ Genuine interest in human environmental sustainability ● Collaboration ○ Practical investigations in groups ○ Researching in teams to collect, process and analyse information ○ Discussion skills leading to decision making or shared understanding. ○ Giving and receiving meaningful feedback to peers	them with the appropriate foundations to access the rigorous and challenging concepts in the IB syllabus.

Teacher	**Semester**	**Block (A=Years 9-11 B=Years 10-11)**
Chris Windle	1 & 2	A (but only for Y10 and Y11)