Course Name: MYP Physics

Course Level: High School
Course Code: PH317/PH327
Course Length: Year
Pre-requisite: Algebra 1
Recommended: 9th grade

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Description

Physics is the study of matter and energy and their interactions. It encompasses natural phenomena from very small sub-atomic particles to the entire universe. Principles of physics are used not only to explain natural and human-made phenomena, but also to clean our environment, to show our way around (GPS), to save lives (medical imaging), and even to model social networks! The study of physics helps students acquire problem-solving and critical-thinking skills and teaches them to better observe and understand the natural world. Physics concepts are continually used in everyday life. It is, therefore, vital that our students learn the basic concepts and principles of physics. Our society is becoming more dependent on technology rooted in physics. The main goal of physics for high school students is to deepen their abilities for scientific inquiry and to continue improving their problem-solving and critical-thinking skills. Students should understand and be able to apply concepts and principles of physics to real-world situations and be able to discuss the societal implications of physics.

The aims of all MYP subjects state what a teacher may expect to teach and what a student may expect to experience and learn. These aims suggest how the student may be changed by the learning experience.

The aims of MYP sciences are to encourage and enable students to:

- understand and appreciate science and its implications
- consider science as a human endeavor with benefits and limitations
- cultivate analytical, inquiring and flexible minds that pose questions, solve problems, construct explanations and judge arguments
- develop skills to design and perform investigations, evaluate evidence and reach conclusions
- build an awareness of the need to effectively collaborate and communicate
- apply language skills and knowledge in a variety of real-life contexts
- develop sensitivity towards the living and non-living environments
- reflect on learning experiences and make informed choices.

The objectives of MYP sciences encompass the factual, conceptual, procedural and metacognitive dimensions of knowledge. Each objective is elaborated by a number of **strands**; a strand is an aspect or indicator of the learning goal. Learning Goals are posted on the website and on the whiteboard in class. These objectives relate directly to the assessment criteria found in the "Assessed curriculum" section of this guide. Together these objectives reflect the holistic nature of science and the real-world work of scientists. They enable students to engage with all aspects of science, either through individual objectives or connected processes.

MYP Criterion Assessment Rubric

A Knowing and understanding

Students develop scientific knowledge (facts, ideas, concepts, processes, laws, principles, models and theories) and apply it to solve problems and express scientifically supported judgments.
Tests or exams must be assessed using this objective. To reach the highest level students must make scientifically supported judgments about the validity and/or quality of the information presented to them. Assessment tasks could include questions dealing with "scientific claims" presented in media articles, or the results and conclusions from experiments carried out by others or any question that challenges students to analyze and examine the information and allow them to outline arguments about its validity and/or quality using their knowledge and understanding of science.

In order to reach the aims of sciences, students should be able to:

i. explain scientific knowledge
ii. apply scientific knowledge and understanding to solve problems set in familiar and unfamiliar situations
iii. analyze and evaluate information to make scientifically supported judgments

B Inquiring and designing

Intellectual and practical skills are developed through designing, analyzing and performing scientific investigations. Although the scientific method involves a wide variety of approaches, the MYP emphasizes experimental work and scientific inquiry. When students design a scientific investigation they should develop a method that will allow them to collect sufficient data so that the problem or question can be answered. To enable students to design scientific investigations independently, teachers must provide an open-ended problem to investigate. An open-ended problem is one that has several independent variables appropriate for the investigation and has sufficient scope to identify both independent and controlled variables. In order to achieve the highest level for the strand in which students are asked to design a logical, complete and safe method, the student would include only the relevant information, correctly sequenced.
In order to reach the aims of sciences, students should be able to:

i. explain a problem or question to be tested by a scientific investigation
ii. formulate a testable hypothesis and explain it using scientific reasoning
iii. explain how to manipulate the variables, and explain how data will be collected
iv. design scientific investigations.

C Processing and evaluating

Students collect, process and interpret qualitative and/or quantitative data, and explain conclusions that have been appropriately reached. MYP sciences helps students to develop analytical thinking skills, which they can use to evaluate the method and discuss possible improvements or extensions.
In order to reach the aims of sciences, students should be able to:

i. present collected and transformed data
ii. interpret data and explain results using scientific reasoning
iii. evaluate the validity of a hypothesis based on the outcome of the scientific investigation
iv. evaluate the validity of the method
v. explain improvements or extensions to the method.

D Reflecting on the impacts of science

Students gain global understanding of science by evaluating the implications of scientific developments and their applications to a specific problem or issue. Varied scientific language will be applied in order to demonstrate understanding. Students are

expected to become aware of the importance of documenting the work of others when communicating in science.
Students must reflect on the implications of using science, interacting with one of the following factors: moral, ethical, social, economic, political, cultural or environmental, as appropriate to the task. The student's chosen factor may be interrelated with other factors.
In order to reach the aims of sciences, students should be able to:

i. explain the ways in which science is applied and used to address a specific problem or issue

ii. discuss and evaluate the various implications of the use of science and its application in solving a specific problem or issue
iii. apply scientific language effectively
iv. document the work of others and sources of information used.

Technology and Other Resources used or needed

Textbook: Conceptual Physics (Paul Hewitt)
http://mypphysics.weebly.com/
Google Classroom
www.grps.discoveryeducation.com
Minds On Physics (U.Mass, Henderson)
Thephysicsclassroom.com (Henderson)
Calculator is a must! Scientific or graphing
Online PHET physics simulations
A Folder for class

Pacing and Sequence

Unit	RESOURCES	Topic	Criterion Assessments to Measure Students' Learning	Length (weeks)
1	**Various sources & Hewett Ch. 1-5**	Kinematics	• Criterion A Test • Criterion B Project Design and Performance • Criterion C Job Sheets	8-9
2	**Various sources & Hewett Ch. 6-8, 10**	Forces and Motion	• Criterion C Acceleration Lab • Criterion B Projectile Motion Lab	8-9
3	**Various sources & Hewett Ch. 9, 13, 15, 16**	ENERGY	• Criterion D Project	3-4
4	**Various sources & Hewett Ch. 32-35**	Electricity	• Criterion A Test • Criterion C/D Circuit Design	5 – 6
5	**Various sources & Hewett Ch. 25-31**	Light and Sound	• Criterion A • Criterion B/C • Criterion D	8-9

Grading System

Categories for Science				
Category for Gradebook	Description	% for Category	Overall %	
District Criterion Assessments	See Rubrics above	40	**70**	Performance
Teacher Created Assessments	Quizzes and specific assessments for each activity.	30		
Classwork/Homework	Classwork and Homework	20	**30**	Process
Participation/Practice/Process	Labs, in-class activities	10		

Grading Scale

Percentage	IB Criterion Rubric Scores	Letter Grade	Content Understanding
100%+		A+	Exemplary effort
93-99%	8	A	Outstanding level of effort
90-92%	7	A-	
87-89%		B+	High level of effort
83-86%	6	B	
80-82%		B-	
77-79%	5	C+	Acceptable level of effort
73-76%	4	C	
70-72%	3	C-	
67-69%		D+	Minimal level of effort
63-66%	2	D	
60-62%	1	D-	
0-59%	0	E	Did not take advantage of makeup opportunities.
		I (Incomplete)	Extenuating circumstances did not allow for completion of the work

Literacy Strategies

Double entry notes or Cornell notes
Set a purpose for reading and writing
Reading Guides
Using rubrics
Graphic organizers
KWL
TBD by instructor per students' needs
Summarizing

ATTENDANCE

Attendance at school is an important part of the learning process. It helps students develop habits that prepare them to be reliable citizens, dependable employees, professionals, and business owners. Attendance at school, in accordance with this policy, is an important part of earning credit in any course.

Students may not exceed twelve (12) total absences (excused, unexcused, and fifteen-minute tardy) per class per semester. The twelve (12) day maximum absences to apply to each class and are not the total of all classes. Excused and unexcused absences are counted.

When a student accumulates 12 absences or more in a semester class the following will apply:

1. If a student passes the class AND earns a 70% or higher on the final exam he/she receives the grade and credit earned in the class.
2. If a student passes a class and earns less than 70% on the final exam, he/she will receive an E for the class and will not earn credit. The principal or designee reserves the right, under extenuating circumstances, to modify this guideline.

Assignments and Scores

- Students will be given assignments on a regular basis. **Assignments are due on the required due date as students enter the room for their class** unless directed otherwise. Assignments are worth points as determined by the effort required by the student. Students will receive all points if their work is neat, complete, and shows their best effort on formative assessments. Summative Assessments need to be neat, complete and accurate.
- QOD's are assessed for neatness, completeness and accuracy. These are summative assessments usually, but sometimes formatively assessed. These are found in the Teacher Created Assessment category in Gradebook.
- Homeworks and Classworks are usually worth 20 points. Every time one is due, there is a possibility a quiz in their QOD. Students will receive all points if their work is neat, complete, and ***accurate*****. Homeworks and Classworks are usually formatively assessed but summatively assessed of anything gone over in class.**
- **for quizzes and tests**
  - I can only answer questions for clarification only
  - No talking during quizzes and tests or risk receiving a zero.
  - If a student has an excused absence the day of a quiz or test, arrangements must be made with the instructors to make it up after school. It is the student's responsibility to initiate all conversations regarding make up tests, and the student's responsibility to arrive at the mutually agreed upon time and location.
- **For IB Criterion Assessments**
  - Are scored according to the IB Criterion Assessment Rubrics for science found earlier in this syllabi. The rubrics are also on the website.
- **Late assignments:** Assignments are late after your teacher has collected them. Less than 1 day late a student will receive a 10% reduction in score. 2 days, 20% reduction, etc… with a maximum of 50% reduction in score.

Expectations of Students

Students are expected to learn and adhere to all procedures and protocols as directed by the teacher.

Procedures

before the bell *(You must be on time and start class by yourself)*

- Come to class prepared: bring all materials EVERYDAY
- Sharpen Pencil and get a calculator if needed
- Sit down and follow any instructions posted on the board

during class

- Mentally engage and focus on class work
- Work quietly on warm up activities until the instructors begin
- No passes are for emergencies only. You have a 5 minute break every 49 minutes
- No cell phone use unless instructed so by me!
- Actively participate in all class activities in appropriate ways
- Do not interrupt others who are addressing the class
- Raise your hand to ask questions or to get out of your seat

for communication

- Please refer to instructors and support staff in a respectful way using Mr. or Ms.
- Please raise your hand to ask a question. No outbursts
- Speak to everyone with respect. Encourage each other. Inappropriate language such as, "shut-up" or other profanity will result in disciplinary action.
- Wait until an appropriate time to ask personal questions one on one with me

for the end of class

- Clean up your working environment and throw away your trash
- When I say it is ok, quietly pack up and put your calculator away if needed.
- Stay seated in a chair until I dismiss the class
- Push your chair in when you leave the class