



أكاديمية جيمز العالمية – دبي
GEMS World Academy
DUBAI

COURSE SYLLABUS

Science Year 4/Grade 9

MIDDLE YEARS PROGRAMME

2020
2020

COURSE OVERVIEW

Science 9 is the fourth course in a five-year Science program which includes the study of Chemistry, Physics and Biology. The course includes formative and summative opportunities problem solving in the lab. Students will need to have a solid understanding of the materials covered in order to creatively solve experimental design problems and collect data that proves its success or failure. There is an emphasis on clearly and effectively communicating ideas and supporting these ideas with reliable evidence throughout all criteria.

LEARNING OUTCOMES

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.

Unit 1 – Physics

Approximate Length: 10 weeks

This is an introductory unit into the physics of electricity and magnetism. Topics will include: electrical fields and energy, static electricity, basic electric circuits, all within the context of human energy use and possible sources to fulfill this need.

Unit 2 – Biology

Approximate Length: 10 weeks

This is an introduction into cellular organization (cells, tissues, organs, systems) in the human body. Topic include: cell theory, cell structure (membrane focus), cellular transport, within the context of the digestive, muscular/skeletal, and respiratory system.

Unit 3 Chemistry

Approximate Length: 10 weeks

This is an introduction to the basic concepts and models that will allow students to solve basic problems in chemistry. Topics include: bonding types, atomic structure and rates of reaction.

ASSESSMENT

In the MYP Students will be evaluated using formative and summative assessments.

Formative Assessment: Tasks and assignments that allow the teacher to regularly judge the effectiveness of both teaching and learning processes. This may include teacher observation and oral, written or products of student effort. Examples: class activities, homework and quizzes.

Summative Assessment: The judgment made by the teacher of the standard of achievement and made using task specific rubrics which are published well in advance. Examples: Investigations, presentations, real-life problems, tests.

All assessments will be graded by using a criterion-referenced approach using the “Criterion Objectives” listed below. The assessments will be internally moderated to ensure criteria are assessed evenly between classes. Each assessment will be developed with the IB standards in mind and the objectives applied against the students submitted assessment task. The best-fit approach is applied to ensure the most valid, fair and reliable grade is determined using the IB Grade Boundaries and 7 point scale.

Criterion 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.

Assessment of this objective must be done using tests or exams. 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 allows 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. analyse and evaluate information to make scientifically supported judgments.

Criterion B: Inquiring & 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.

Criterion C: Processing & 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.

Criterion 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.

EXTENSION OF LEARNING

A range of extension activities are highlighted in the unit booklets and students in the ELG classes (Enhanced Learning Groups) are expected to cover all of this work. Students in other classes can optionally choose to work on these extension activities and the teacher will mark them and feedback. Further stretch and challenge activities to extend students learning and understanding on an individual basis as they progress through the course will be offered, these include STEM opportunities, online coding/AI/robotics courses and differentiating the use of IXL and Kognity. Science Olympiads are also entered.

STUDENTS RESPONSIBILITIES

Academic Honesty

GWA maintains very strict guidelines towards maintaining academic honesty as followed by IB students globally.

1. First offense: A student who submits plagiarized work will be required to meet with the teacher to discuss the offense.
 - The teacher will notify the parents and the MYP Coordinator by email of the offense.
 - The student will be required to repeat the assessment for **formative feedback purposes only.**(The summative cannot be graded as it was not the students' work.)
2. Second offense: The teacher will notify the parents and the appropriate Assistant Principal.
 - An interview will take place and the assessment will received a grade of (0). The assessment will be completed for **formative purposes only.**

Late Assessment Policy

When assessing students at GWA it is important for teachers to be able to provide students and their parents with a grade that, as much as possible, reflects their ability in a course. It is also important for students to meet reasonably established timelines to complete their assessments. In order to achieve this goal, the following procedures for the submission of summative assessments has been established:

1. Teachers will post the due date on ManageBac with at least one (calendar) week lead time for students to complete the assessment.
2. Submission of the assessment by students on the due date. If a deadline cannot be met, in order for the work to be evaluated, students must: provide a doctor's note, or provide a note from a parent explaining special family circumstances, or have established an extension with the teacher at least two days in advance. Such extensions will be given at the teacher's discretion.
3. MYP students must adhere to published deadlines. Students who do not meet IB Diploma Programme deadlines will follow these steps:
 - Detention(s) until the assessment is completed
 - Parent meeting to discuss behavior concern
 - After 3 offenses: Parents contacted and additional detentions and/or an in-school suspension until the assessment is completed. Students must make up all worked missed during the suspension.
4. Repeated failure to meet deadlines will result in narrative comments addressing these concerns in report cards and letters of recommendation to other schools.

APPENDIX

Classroom Expectations:

- Be on time
- BE PREPARED – have all books and supplies ready when class begins this would include black pen, pencil, ruler and a calculator
- Bring your own electronic device – iPad and ensure that the “Easysense”, pHet and Notability software is installed prior to the lessons
- LISTEN when others are speaking – Respect other's and learn from the information they are trying to share
- Exhibit MYP learner profile characteristics – respect yourself by becoming the best person you can be
- Complete all formative tasks in your Science Learning Journey lab books
- Aim to prepare for MAP assessments and actively work to improve RIT and %ile scores before each MAP session