



## **Chemistry 2021/2022**

### **A brief description of the course**



### **General info on course**

The Chemistry course is designed to be the equivalent of the general chemistry course. Students in such a course should attain a depth of understanding of fundamentals and a reasonable competence in dealing with chemical problems. The course should contribute to the development of the students' abilities to think clearly and to express their ideas, orally and in writing, with clarity and logic. This course examines the composition of various substances and the changes they can go through. It also shows how chemistry touches our lives almost everywhere and everyday, in medicine, the clothes we wear, the games we play, as well as the industries that make the things we use. The periodic table and simple compounds are covered as well as the basics of Chemistry.

Chemistry course will involve a lot of writing in form of essays on almost each course topic. Students will be required to do a variety of different projects and experiments on almost each subject topic and will be expected to do a lot of self-reflection and self-evaluation at the end of each unit of work.

The school offers two lessons on Chemistry per week.

### **Topics:**

#### **MYP 4**

#### **Evolution of atomic structure and periodic table (Basic concepts in Chemistry)**

**Scientists discern patterns and use them to construct systems with rules and conventions that help to explain how the world works.**

- Composition of matter
- Naming compounds
- Chemical equations
- States of matter
- Different properties of matter
- Atomic structure
- The Periodic law and Periodic table
- Trends in the Periodic table
- Physical and chemical properties of elements

#### **How Much? How Many? (Stoichiometry)**

**Mathematical relationships are one of the fundamental parts of chemistry**

- Chemical reaction
- Relationships between compounds in balanced reactions
- Mole ratio

### **May the force be with you (Bonding)**

**Scientists use bonding models to explain the nature of interactions between different types of particles**

- Intramolecular forces: ionic, metallic and covalent bonding
- Intermolecular forces: van der Waals forces, dipole-dipole attraction and hydrogen bonding
- Different properties of differently bonded compounds

### **MYP 5**

### **Fast and furious (Rate and equilibrium)**

**What are consequences of changing factors affecting the rate and equilibrium on our life Rate of chemical reaction**

- Factors that affect the rate
- Chemical equilibrium
- Le Chatelier's principle

### **Air and water pollution and acidity of mixtures**

**Human interactions with nature have significant consequences on the environments which can be seen in everyday life**

- Theories of acids and bases: Arrhenius, Brønsted and Lewis
- Structure of acids and bases.
- Strength of acids and bases
- The ion product of water.
- pH and pOH.
- Acidobasic indicators and acidobasic titration
- Properties, structure and naming salts

### **Energize me (Electrochemistry)**

**Understanding that various forms of energy have specific relationships which can be seen by observing their interactions and transformations of forms which has specific impact on our life.**

- Redox reactions and oxidation numbers
- Galvanic cells; Batteries
- Standard electrode potentials
- Electrolytic cells

## **Aims and objectives:**

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

- understand and appreciate science and its implications
- consider science as a human endeavour 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.

In order to reach the aims of studying science students should be able to meet the following objectives :

### **Objective A:** Knowing and understanding :

- 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.

### **Objective B;** Inquiring and designing

- 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.

### **Objective C;** Processing and evaluating

- 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.

**Objective D;** Reflecting on the impacts of science

- 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.

**Assessment:**

The assessment criteria provided by the IB are presented to the students at the beginning of school year as summary of Chemistry course-curriculum. Students are assessed according to the prescribed (MYP5) and interim (MYP4) descriptors for grading. At the beginning of each task or project, students are provided by assessment criteria and descriptors for each criterion that will be marked on that project or task. Students will be assessed continually in form of oral examination and in written form. A written work will consist of piece of written text-essay (D criterion), quizzes( A criterion), homework assignments, end-of-topic test (A criterion), scientific investigations / lab reports (B and C criterion). During each project or task students will be assessed for personal engagement.

At the end of the school year points are given in each criteria taking into account achievements in all individual tasks (formative and summative assessment). Final grades are derived according to the grade boundaries provided by the IB (MYP 5):

<b>Science(Biology, Chemistry and Physics)</b>	
<b>Grade</b>	<b>Boundaries</b>
<b>1</b>	<b>0-5</b>
<b>2</b>	<b>6-9</b>
<b>3</b>	<b>10-14</b>
<b>4</b>	<b>15-18</b>
<b>5</b>	<b>19-23</b>
<b>6</b>	<b>24-27</b>
<b>7</b>	<b>28-32</b>