# IB Chemistry

## 1. NATURE OF SCIENCE

**Standard 1.1: Understand the nature of scientific inquiry *(Understand and use the scientific method)***

- 1.1.1 Ask scientific questions
- 1.1.2 Formulate hypotheses
- 1.1.3 Identify and distinguish dependent, independent and control variables
- 1.1.4 Implement and revise experimental procedures.
- 1.1.5 Collect and organize raw data
- 1.1.6 Process and present data.

**Standard 1.2: Communicate scientific ideas and activities clearly**

- 1.2.1 Compare results with published accepted values
- 1.2.2 State a justifiable conclusion.
- 1.2.3 Evaluate the results of scientific investigations, experiments, observations, theoretical and mathematical models, and explanations proposed by other scientists
- 1.2.4 Explain how and why ethical consideration can limit scientific research

**Standard 1.3: Investigate using appropriate tools and instruments to conduct scientific activities**

- 1.3.1 Use technology and mathematics to perform accurate scientific investigations and communication
- 1.3.1 Choose/use scientific tools appropriately

**Standard 1.4: Understand the nature of scientific knowledge and enterprise *(Understand why science is important)***

- 1.4.1 Develop awareness of ethics involved in the scientific enterprise
- 1.4.2 Recognize the dynamic nature of scientific knowledge.
- 1.4.3 Peer review and reflect on scientific presentations.

## 2. LIFE SCIENCES

**Standard 2.2: Understand the structure and function of cells and organisms**

- 2.2.1 Describe the structures and functions of the basic elements and molecules of living organisms
- 2.2.3 Explain the other chemical reactions necessary for life.

**Standard 2.4: Understand the cycling of matter and the flow of energy through ecosystems**

- 2.4.4 Describe the laws of thermodynamics and apply the principles to an ecosystem

## 3. PHYSICAL SCIENCES

**Standard 3.1: Understand the structure and properties of matter**

- 3.1.1 Describe the structure and behavior of matter at the atomic and subatomic level.
- 3.1.2 Apply the conservation laws of matter.
- 3.1.3 Explain the origin and significance of emission and absorption spectra
- 3.1.4 Explain the origin and significance of emission and absorption spectra.
- 3.1.5 Describe the rearrangement of atoms in chemical reactions.
- 3.1.6 Explain molecular shapes

**Standard 3.2: Understand the sources and properties of energy**

- 3.2.1 Know that energy and matter are interchangeable
- 3.2.2 Explain the conservation of energy and how it applies to energy transformations.
- 3.2.3 Explain the role of energy in bonding
- 3.2.4 Explain and apply the different forms of energy transfer.

**Standard 3.3: Understand forces and motion**

- 3.3.2 Define, explain and apply kinematic concepts classical and modern
- 3.3.3 Define, explain and apply the concepts, classical and modern, involved in dynamics

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### 4. EARTH AND BEYOND

**Standard 5.1: Understand the composition, structure and features of the geosphere, hydrosphere and atmosphere**

5.1.1 Know that elements exist in fixed amounts and move through the solid Earth, oceans, atmosphere, and living things as part of geochemical cycles (e.g., carbon cycle, nitrogen cycle).



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