

## Scientific disciplines

The word 'science' comes from the Latin *scientia*, meaning knowledge. Science has been defined as knowledge obtained through study or practice, its purpose being to produce useful models of reality. There are a lot of possible fields of science. The two major groups are the so-called natural sciences, concerning the study of the natural world, and the social sciences, that is the systematic study of human behaviour and society. In addition formal sciences, such as mathematics and physics, the humanities, such as arts, literature and philosophy, and applied sciences, such as engineering and medicine, are in a broad sense part of the big science family.

Focusing on natural sciences, they refer to the human effort<sup>1</sup> to understand, or to better understand, the history of the natural world and how the natural world works, with observable physical evidence<sup>2</sup> as the basis of that understanding. The major natural sciences are biology, chemistry, physics and earth science,

with all their sub-branches.

Biology is the science of life and living organisms; biological fields include botany, zoology, microbiology and genetics.

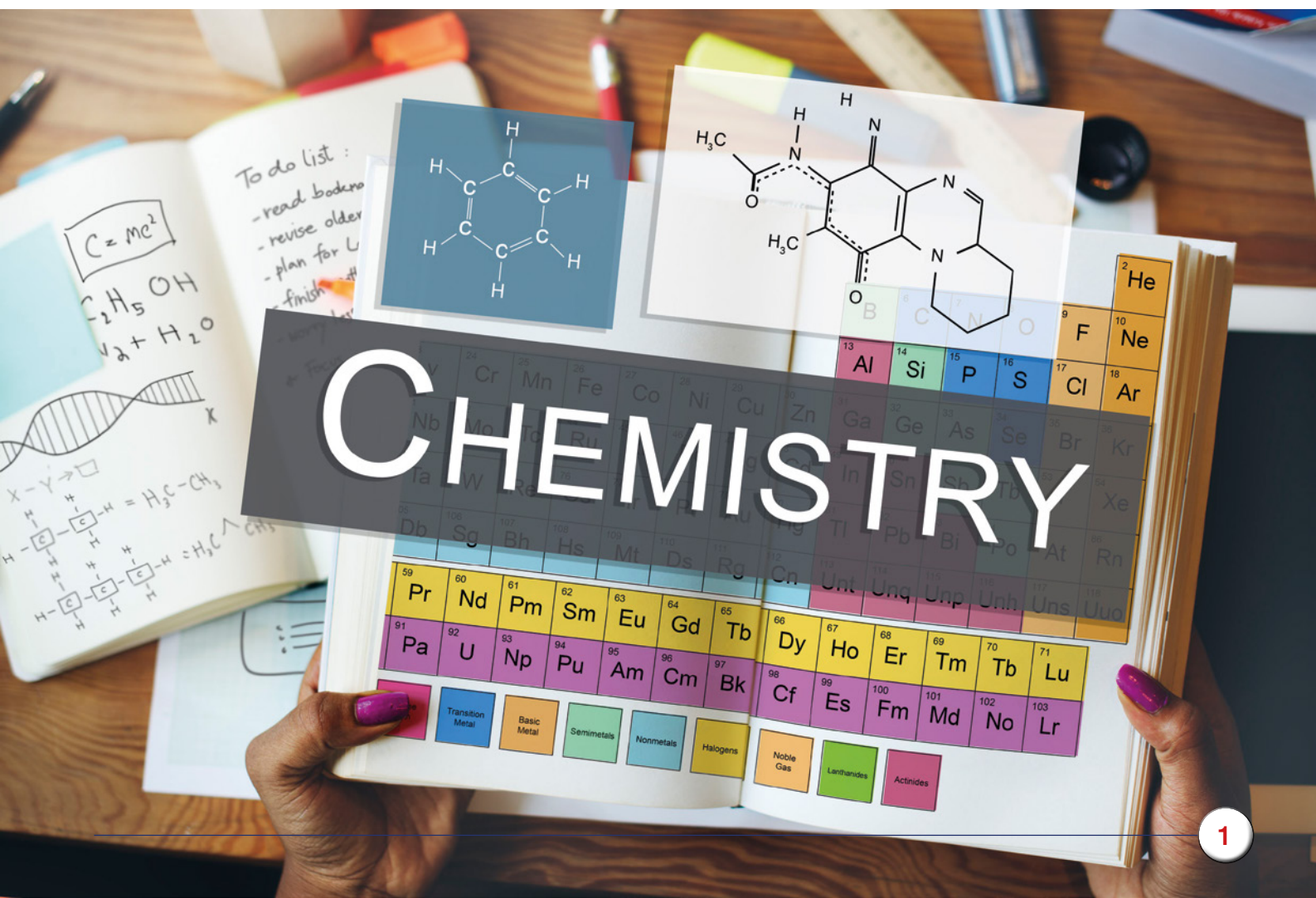
Chemistry is the study of structure, properties and reactions of matter at the atomic and molecular scale. It is often referred to as "the central science" because of its role in connecting the other natural sciences.

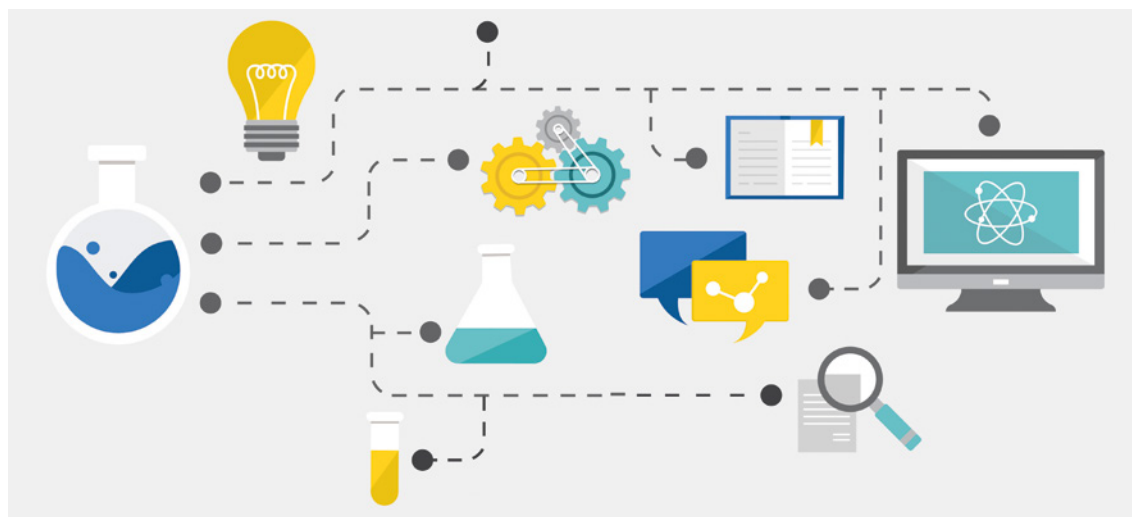
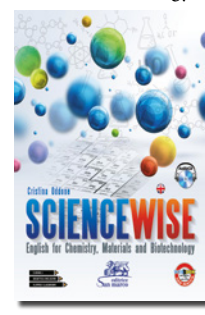
Physics concerns the study of the fundamental constituents of the universe, of their interactions and of the results derived from these interactions. Mathematics is basilar to physics, as it is used to formulate and quantify physics principles. Sub-branches of physics include acoustics, optics, astronomical studies, nuclear physics.

Earth science comprises all the sciences concerning the planet Earth, such as geology, physical geography, oceanography, meteorology. There are also disciplines involving more than one science: they are grouped in interdis-

### GLOSSARY

- 1 a determined attempt
- 2 data on which to base proof or establish truth





ciplinary sciences, or cross-disciplines. Among them astrophysics, geophysics and biophysics involve physics, while biochemistry, geochemistry and astrochemistry involve chemistry. An interesting cross-discipline is environmental science, which studies the interactions of the various components of the environment from a physical, chemical and biological point of view. It specifically analyses the effects of human activities on the environment and their impact on biodiversity and **sustainability**.

The term **sustainability** refers to the long-term maintenance of well being. Sustainable development has been defined as development that meets the needs of the present without compromising the ability of future generations to meet their own needs. This entails the reconciliation of the so-called three pillars of sustainability: environmental, social and economic demands.

## ACTIVITIES

### 1 Complete with information from the text.

- |                            |                           |
|----------------------------|---------------------------|
| 1 Groups of sciences ..... | 3 Sub-branches .....      |
| 2 Major disciplines .....  | 4 Cross-disciplines ..... |

### 2 Answer the following questions.

- Where does the word 'science' come from?
- What is the purpose of science?
- What do natural sciences deal with?
- Which science studies life and living organisms?
- Why is chemistry referred to as "the central science"?
- Which formal discipline is basilar to physics?
- What are cross-disciplines?
- What does environmental science study?

### 3 Match the following words or expressions to the corresponding definition.

- |                 |   |
|-----------------|---|
| 1 Purpose       | A The study of animals  |
| 2 Behaviour     | B The study of plants   |
| 3 Society       | C Manner of conducting oneself in a specific way                                      |
| 4 Literature    | D Branch of science involving the study of microorganisms                             |
| 5 Botany        | E Branch of science concerned with vision and light                                   |
| 6 Zoology       | F The reason for which anything is done   |
| 7 Microbiology  | G The aggregate of all existing matter, energy and space                              |
| 8 Universe      | H A system of human organisations with distinctive cultural patterns and institutions |
| 9 Optics        | I Written material such as poetry, novels, essays, etc.                               |
| 10 Biodiversity | J The number and variety of organisms found within a specified geographic area        |

### 4 Which of the disciplines mentioned in the text do you find particularly interesting? Why? Discuss with the class.