Cañada Blanch Spanish School Founded 1972	PHYSICS AND CHEMISTRY 2 ESO

EXTRACT FROM THE TEACHING PROGRAM FOR PHYSICS AND CHEMISTRY FOR 2ND ESO

Below are the most important aspects of the FYQ 2º ESO course programming.

It is a new subject for 2nd year ESO students but we should not fear it or approach it with fear. It is a very interesting subject in which we will approach physical and chemical phenomena that happen around us, using a little mathematics.

Don't lose sight of Google classroom, where what has been worked on in class will be posted every day, as well as the homework for the following day.

My advice, which I will repeat over and over again, is to work on it DAY BY DAY.

SPECIFIC COMPETENCES:

1. Understand and relate the reasons why the main physicochemical phenomena of the environment occur, explaining them in terms of the appropriate scientific laws and theories, to solve problems in order to apply them to improve the nearby reality and the quality of human life.
2. Express the observations made by students in the form of questions, formulating hypotheses to explain them and demonstrating these hypotheses through scientific experimentation, inquiry and the search for evidence, in order to develop the reasoning inherent to scientific thinking and improve skills in the use of scientific methodologies.
3. Fluent in the basic rules and standards of physics and chemistry in relation to IUPAC language, mathematical language, the use of correct units of measurement, the safe use of the laboratory and the interpretation and production of data and information in different formats and sources, in order to recognise the universal and transversal nature of scientific language and the need for reliable communication in research and science between different countries and cultures.
4. Use digital platforms and various resources critically, efficiently and safely, both for individual and team work, to promote creativity, personal development and individual and social learning, through consulting information, creating materials and effective communication in different learning environments.
5. Use the strategies of collaborative work, promoting growth among equals as an entrepreneurial basis for a critical, ethical and efficient scientific community, to understand the importance of science in improving society, the applications and repercussions of scientific advances, the preservation of health and the sustainable conservation of the environment.
6. Understanding and valuing science as a collective construction in continuous change and evolution, in which not only the people dedicated to it participate, but which also requires interaction with the rest of society, to obtain results that impact technological, economic, environmental and social progress.

BASIC KNOWLEDGE

Basic scientific skills: DCB

1. Scientific method: identification and formulation of questions, development of hypotheses and experimental verification of the same.
2. Experimental work and research projects.
3. Various scientific learning environments and resources such as the laboratory or virtual environments: materials, substances and technological tools.
4. Basic safety measures in the laboratory and when accessing the Internet.

5. Scientific language: SI units and their symbols. Multiples and submultiples of units. Conversion factors and scientific notation. Basic mathematical tools. Data processing and deduction of qualitative relationships between them.
6. Strategies for the interpretation and production of scientific information: Data collection, table creation, graphical representation and qualitative interpretation. Graphical representations of data.
7. Assessment of scientific culture and the role of scientists in the main historical and current milestones of physics and chemistry in the advancement and improvement of society.

The subject: M

1. Kinetic-molecular theory: states, changes of state, and classification of matter. Concentration of solutions. Basic techniques for separating mixtures and solutions.
2. Experiments related to material systems: properties, composition and classification. Differences between elements and compounds. Introduction to atomic theory and the periodic table. Names and formulas of the most common inorganic substances.
3. The relative abundance of chemical elements.

Energy: E

1. Energy: units, properties and transformation. Kinetic, potential and mechanical energies. Forms of heat transfer and temperature scales.
2. Domestic and industrial use of energy in its different forms and the transformations between them.
3. Environment and sustainability based on the differences between renewable and non-renewable energy sources. Environmental consequences of the use of different energy sources.
4. Movement: concepts of position, trajectory, speed and acceleration. Study of simple movements through numerical calculation, interpretation of graphs or experimental work. MRU.
5. Forces: units and effects (alteration of the state of rest or movement of a body and/or deformations). Static equilibrium. Qualitative interpretation of the laws of dynamics and study of Hooke's law. Implication of these phenomena in road safety.

The change: C

1. Material systems: analysis of the different types of changes they experience, relating the causes that produce them with the consequences they have. Physical and chemical changes.
2. Chemical reactions: classification and adjustment of simple chemical reactions. Energy and speed of chemical reactions.

EVALUATION CRITERIA:

1. Specific competence 1.
   - **1.1.** Identify, understand and explain the most relevant everyday physical-chemical phenomena, based on the appropriate scientific principles, theories and laws, expressing them in an argued manner, using a variety of media and supports.
   - **1.2.** Solve the physicochemical questions raised using the appropriate scientific laws and theories, reasoning the procedures used to find the solutions and expressing the results coherently.
2. Specific competence 2.
   - **2.1.** Use the methodologies of science in the identification and description of phenomena based on questions that can be answered through inquiry, deduction, experimental work and logical-mathematical reasoning, differentiating them from pseudoscientific methods that do not admit experimental verification.
   - **2.2.** Select, according to the nature of the issues being addressed, logical ways of verifying or refuting the hypotheses formulated, designing strategies of inquiry and search for evidence that allow obtaining conclusions and answers adjusted to the nature of the question formulated.
   - **2.3.** Apply known scientific laws and theories when formulating questions and hypotheses, in a manner consistent with existing scientific knowledge and proposing experimental or deductive procedures necessary to resolve or verify them.

3. Specific competence 3.
   3.1. Use data in the given formats to interpret and communicate information related to a specific physicochemical process, establishing relationships between them, and extracting in each case the most relevant information to answer a question.
   3.2. Properly use the basic rules of physics and chemistry, including the use of units of measurement of the International System and the appropriate mathematical tools, achieving effective communication with the entire scientific community.
   3.3. Implement the rules for the use of specific science spaces, such as the physics and chemistry laboratory, ensuring personal and collective health, sustainable conservation of the environment and care of the facilities.

4. Specific competence 4.
   4.1. Use traditional and digital resources, improving autonomous learning and interaction with other members of the educational community, with respect towards teachers and students and analyzing the contributions of each participant.
   4.2. Working appropriately with traditional and digital media, consulting information and creating content, judiciously selecting reliable sources, discarding less appropriate ones and improving personal and collective learning.

5. Specific competence 5.
   5.1. Establish constructive and coeducational interactions, undertaking cooperative activities as a way of building an efficient way of working in science.

6. Specific competence 6.
   6.1. Recognize and value, through historical analysis of scientific advances achieved by men and women of science, that science is a process in permanent construction and that there are mutual repercussions of current science with technology, society and the environment.

Below are the different programming units that will be studied during the 2nd ESO course. The following observations are valid for all of them.

- The timing is indicative and depends on the progress of the course in each case, and may be modified at the discretion of the teacher.
- Regarding the assessment instruments: this does not mean that each and every one of those mentioned in the different programming units/learning situations will be used obligatorily. Those that can be used are indicated, something that will be adapted to the diversity of each group and each student.
- The percentages assigned to each assessment criterion are all equal, i.e. if a programming unit has 10 assessment criteria, each of them will have a percentage of 10%, or if another unit has 7 assessment criteria, the weighting of each of them will be 100/7%. This generalisation can be modified throughout the year depending on the characteristics of the class group.
- The evaluation grade will be obtained from the arithmetic mean of the grades obtained in the programming units indicated in the tables corresponding to each of the subjects, taking into account the units developed throughout the evaluation.
- In addition, the possibility of increasing the final evaluation grade by 0.5 is proposed for the first two students in the class who solve the scientific challenge posed each month (except in exceptional cases). This Scientific Challenge, which has already been developed during the last two courses and is therefore known to the students, can be based on the following evaluation criteria: 1.1., 1.2., 2.1., 2.2., 2.3., 3.1., 4.1., 4.2., 6.1.

The 2nd ESO Physics and Chemistry programming units are the following:

PROGRAMMING UNIT / LEARNING SITUATION		TIMING
1. Scientific method		September
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES- CAS, Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1, 2, 3, 4, 5, 6, 7	1 to 6	1.1. 1.2. 2.1. 2.2. 23. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work, Scientific challenge Scientific Notation Worksheet, Conversion Factors Worksheet. Safety pictograms, poster with safety regulations for the laboratory. Live worksheets. Memory: safety pictograms, Topic 1 notes prepared by the teacher. Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com		

PROGRAMMING UNIT/LEARNING SITUATION		TIMING
2. Density		**October**
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES- CAS, Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1, 2, 3, 4, 5, 6, 7 M1 M2 C1	1 to 6	1.1. 1.2. 2.1. 2.2. 23. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work, Scientific challenge Properties of matter exercises, Density exercises. Live worksheets. Laboratory practice: measurement of mass and volumes, density; density traffic light. Topic 2 notes prepared by the teacher. Density Laboratory:https://www.educaplus.org/game/laboratorio-de-densidad Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com		

PROGRAMMING UNIT/LEARNING SITUATION		TIMING
3. States of matter and their changes		November
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES- CAS, Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1, 2, 3, 4, 5, 6, 7 M1 M2 M3 E1 C1	1 to 6	1.1. 1.2. 2.1. 2.2. 23. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work, Science challenge, Live worksheets. State change graph exercises; Laboratory practice: heating water. Simulator:https://phet.colorado.edu/es/simulations/states-of-matter Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Topic 2 notes and Topic 3 notes, prepared by the teacher.		

PROGRAMMING UNIT / LEARNING SITUATION		TIMING
4. Classification of matter		December
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES- CAS, Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1, 2, 3, 4, 5, 6, 7 M1 M2 M3 C1	1 to 6	1.1. 1.2. 2.1. 2.2. 23. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work, Science challenge Live worksheets. Exercises on pure substances and mixtures, Exercises with concentration of solutions Exercises on separation of mixtures, Topic 2 notes prepared by the teacher. Laboratory practice, Online simulator:https://phet.colorado.edu/en/simulations/energy-forms-and-changes Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com		

PROGRAMMING UNIT / LEARNING SITUATION		TIMING
5. The atom		January
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES- CAS, Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1, 2, 3, 4, 5, 6, 7 M3 C1	1 to 6	1.1. 1.2. 2.1. 2.2. 23. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Scientific challenge. Model or timeline of the atom. Online simulator:https://phet.colorado.edu/sims/html/build-an-atom/latest/build-an-atom_es.html Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Topic 4 notes prepared by the teacher. Live worksheets.		

PROGRAMMING UNIT / LEARNING SITUATION		TIMING
6. Elements and compounds		February
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES- CAS, Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1, 2, 3, 4, 5, 6, 7 M1 M2 M3 C1	1 to 6	1.1. 1.2. 2.1. 2.2. 23. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Scientific challenge. Live worksheets. The dice of the formulation.,Recreation of molecules with molecular models. Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Topic 4 notes prepared by the teacher.		

PROGRAMMING UNIT/LEARNING SITUATION		TIMING
7. Chemical reactions		March
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES- CAS, Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1, 2, 3, 4, 5, 6, 7 M1 M2 M3 C1 C2	1 to 6	1.1. 1.2. 2.1. 2.2. 23. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Exercises on formulation, adjustment and classification of chemical reactions. Scientific challenge. Laboratory practice. Live worksheets. Chemical equations adjustment simulator:https://phet.colorado.edu/sims/html/balancing-chemical-equations/latest/balancing-chemical-equations_es_ES.html Genially adjusted reactions:https://view.genial.ly/5e0f22afa2f46b0f5732c439/game-reacciona-a-la-caida Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Topic 5 notes prepared by the teacher.		

PROGRAMMING UNIT/LEARNING SITUATION		TIMING
8. The movement		March-April
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES- CAS, Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1, 2, 3, 4, 5, 6, 7 I1	1 to 6	1.1. 1.2. 2.1. 2.2. 23. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Scientific challenge. Laboratory practice. Basic movement concepts exercises. Live worksheets. General MRU exercises. Pursuit and encounter exercises. Online simulator:https://phet.colorado.edu/es/simulations/forces-and-motion-basics Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Topic 6 notes prepared by the teacher.		

PROGRAMMING UNIT / LEARNING SITUATION		TIMING
9. The forces		April-May
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES- CAS, Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1, 2, 3, 4, 5, 6, 7 E4 E5	1 to 6	1.1. 1.2. 2.1. 2.2. 23. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Scientific challenge. Laboratory practice. Daily strengths exercises. Live worksheets. Online simulator:https://phet.colorado.edu/es/simulations/forces-and-motion-basics Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Topic 7 notes prepared by the teacher.		

PROGRAMMING UNIT / LEARNING SITUATION		TIMING
10. The energy		June
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES- CAS, Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1, 2, 3, 4, 5, 6, 7 E1 E2 E3	1 to 5	1.1. 1.2. 2.1. 2.2. 23. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Scientific challenge. Mechanical energy exercises. Laboratory practice. Live worksheets. Online simulator: https://phet.colorado.edu/es/simulations/energy-skate-park-basics Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Topic 8 notes prepared by the teacher.		

Cañada Blanch Spanish School Founded 1972	PHYSICS AND CHEMISTRY 3RD ESO

EXTRACT FROM THE TEACHING PROGRAM FOR PHYSICS AND CHEMISTRY FOR 3RD ESO

Below are the most important aspects of the FYQ 3nd ESO course programming.

In 3rd ESO, some of the aspects introduced in the 2nd ESO subject are studied in depth, reviewing and expanding on what has already been studied in the previous year.

The work done in class, as well as the homework for the following day, will be posted on the Google Classroom platform every day.

My advice, which I will repeat over and over again, is to work on it DAY BY DAY.

SPECIFIC COMPETENCES:

1. Understand and relate the reasons why the main physicochemical phenomena of the environment occur, explaining them in terms of the appropriate scientific laws and theories, to solve problems in order to apply them to improve the nearby reality and the quality of human life.
2. Express the observations made by students in the form of questions, formulating hypotheses to explain them and demonstrating these hypotheses through scientific experimentation, inquiry and the search for evidence, in order to develop the reasoning inherent to scientific thinking and improve skills in the use of scientific methodologies.
3. Fluent in the basic rules and standards of physics and chemistry in relation to IUPAC language, mathematical language, the use of correct units of measurement, the safe use of the laboratory and the interpretation and production of data and information in different formats and sources, in order to recognise the universal and transversal nature of scientific language and the need for reliable communication in research and science between different countries and cultures.
4. Use digital platforms and various resources critically, efficiently and safely, both for individual and team work, to promote creativity, personal development and individual and social learning, through consulting information, creating materials and effective communication in different learning environments.
5. Use the strategies of collaborative work, promoting growth among equals as an entrepreneurial basis for a critical, ethical and efficient scientific community, to understand the importance of science in improving society, the applications and repercussions of scientific advances, the preservation of health and the sustainable conservation of the environment.
6. Understanding and valuing science as a collective construction in continuous change and evolution, in which not only the people dedicated to it participate, but which also requires interaction with the rest of society, to obtain results that impact technological, economic, environmental and social progress.

BASIC KNOWLEDGE

Basic scientific skills: DCB

1. Experimental work and research projects
2. Various scientific learning environments and resources such as the laboratory and virtual environments: materials, substances and technological tools.
3. Rules for use of each space. Safety rules in the laboratory and security on networks.
4. Scientific language: SI units and their symbols. Using conversion factors between different unit systems. Basic mathematical tools
5. Strategies for interpretation and production of scientific information: Data collection, table creation, graphical representation and qualitative interpretation. Graphical representations of data

The matter: M

1. Atomic structure: historical development of atomic models, isotopes, periodic table and their relationship with the electronic configuration of the elements.
2. Main chemical compounds: their formation and physical and chemical properties, assessment of their applications. Atomic mass and molecular mass. Concept of mole and application to material systems.
3. Nomenclature: simple substances, monatomic ions and binary compounds using IUPAC nomenclature rules.

Energy: E

1. Effects of heat on matter: analysis of the effects and application in everyday situations. Differences between heat, temperature and thermal energy. Temperature variation and changes of state.
2. Electrical nature of matter: electrification of bodies, electrical circuits and obtaining electrical energy. Degradation of energy in its production. Concept of energy efficiency. Energy saving and sustainable conservation of the environment.

The interaction: I

1. Application of Newton's laws: calculations of accelerations and observation of everyday or laboratory situations that allow us to understand how material systems behave under the action of forces and to predict their effects in everyday and road safety situations. Free-body model for solving problems of statics and dynamics of particles. Gravitational, electrical and magnetic phenomena: simple experiments that show the relationship with the forces of nature. Experimental evidence of the relationship between electricity and magnetism. Qualitative analysis of the movement of objects in orbit.

The change: C

1. Law of conservation of mass and law of definite proportions. Stoichiometric relationships of chemical reactions.
2. Factors affecting chemical reactions and their speed.
3. Energy aspects of chemical changes: exothermic and endothermic processes.
4. Analysis of enthalpy diagrams at a qualitative level.

EVALUATION CRITERIA:

1. Specific competence 1.
   - **1.1.** Apply appropriate scientific laws and theories, and develop them correctly to solve physical-chemical problems.
   - **1.2.** Recognize and describe real scientific problematic situations in the immediate environment, critically analyzing their impact on society.
2. Specific competence 2.
   - **2.1.** Select the best way to verify or refute formulated hypotheses, with strategies that allow obtaining conclusions and answers adjusted to the nature of the question asked.
   - **2.2.** Apply known scientific laws and theories when formulating questions and hypotheses, designing experimental or deductive procedures necessary to solve or verify them.
3. Specific competence 3.
   - **3.1.** Use data in different formats to interpret and communicate information related to a specific physicochemical process.
   - **3.2.** Properly use the basic rules of physics, chemistry and mathematics, such as units of measurement, scientific notation and nomenclature.
4. Specific competence 4.
   - **4.1.** Use of varied traditional and digital resources to develop both independent and group work.
   - **4.2.** The same as 4.1. for consulting information and creating content, carefully selecting the most reliable sources and discarding the less appropriate ones.

5. Specific competence 5.
   - **5.1.** Undertake scientific projects that involve students.

6. Specific competence 6.

6.1. Understand the capacity of science to provide sustainable solutions to the most important technological, environmental, economic and social needs demanded by society.

Below are the different programming units that will be studied during the 3rd ESO course. The following observations are valid for all of them.

- The timing is indicative and depends on the progress of the course in each case, and may be modified at the discretion of the teacher.
- Regarding the assessment instruments: this does not mean that each and every one of those mentioned in the different programming units/learning situations will be used obligatorily. Those that can be used are indicated, something that will be adapted to the diversity of each group and each student.
- The percentages assigned to each assessment criterion are all equal, i.e. if a programming unit has 10 assessment criteria, each of them will have a percentage of 10%, or if another unit has 7 assessment criteria, the weighting of each of them will be 100/7%. This generalisation can be modified throughout the year depending on the characteristics of the class group.
- The evaluation grade will be obtained from the arithmetic mean of the grades obtained in the programming units indicated in the tables corresponding to each of the subjects, taking into account the units developed throughout the evaluation.
- In addition, the possibility of increasing the final evaluation grade by 0.5 is proposed for the first two students in the class who solve the scientific challenge posed each month (except in exceptional cases). This Scientific Challenge, which has already been developed during the last two courses and is therefore known to the students, can be based on the following evaluation criteria: 1.1., 1.2., 2.1., 2.2., 2.3., 3.1., 3.2., 4.1., 4.2., 6.1.

The 3rd ESO Physics and Chemistry programming units are the following:

TEACHING UNITS / LEARNING SITUATIONS		**TIMING**
1. Scientific method		September
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB 5	1 to 6	1.1 1.2. 2.1 2.2. 3.1. 3.2. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Scientific notation worksheet. Scientific challenge Conversion factors worksheet. Hazards symbols worksheet. Kahoot. Memory hazard symbols. Live worksheets. Activities from unit 2 of the textbook.		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
2. Properties of matter		October
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB 5, E1	1 to 6	1.1 1.2. 2.1 2.2. 3.1. 3.2. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Density activities worksheet. Activities from units 2 and 3 of the textbook. Laboratory practice and/or simple experiments. Live worksheets. Density Laboratory:https://www.educaplus.org/game/laboratorio-de-densidad Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
3. The atom		November
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 DCB 5 and M1	1 to 6	1.1 1.2. 2.1 2.2. 3.1. 3.2. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Timeline of the atom. Scientific challenge Atomic models, experiments. Atomic models infographics. Live worksheets. Activities from unit 4 of the textbook. Online simulator: atom builderhttps://phet.colorado.edu/es/simulations/build-an-atom		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
4. Elements and compounds: the link		December-January
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB 5, M1 M2 M3	1 to 6	1.1 1.2. 2.1 2.2. 3.1. 3.2. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Laboratory practice and/or simple experiments. Formulation sheets provided by the teacher. Live worksheets. Activities from unit 5 of the textbook. Games about the periodic table: memory, bingo, double,… developed by the teacher. Scientific challenge. Formulation dice. Recreating molecules with molecular models. Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Online simulator: atom builderhttps://phet.colorado.edu/es/simulations/build-an-atom		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
5. Chemical reactions		January-February
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB 5, M1, M2, M3, C1, C2, C3	1 to 6	1.1 1.2. 2.1 2.2. 3.1. 3.2. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Formulation, adjustment and classification sheets for chemical reactions provided by the teacher. Simulation of reaction adjustments with balls. Laboratory practice and/or simple experiments. Live worksheets. Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Online balancing reaction simulator: https://phet.colorado.edu/sims/html/balancing-chemical-equations/latest/balancing-chemical-equations_es_ES.html Activities from unit 6 of the textbook. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
6. Movement and forces.		February-March
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB 5 I1	1 to 6	1.1 1.2. 2.1 2.2. 3.1. 3.2. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work, Scientific challenge. Laboratory practice and/or simple experiments. Live worksheets. Activities from unit 7 of the textbook. Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Online simulator forces and movements:https://phet.colorado.edu/es/simulations/forces-and-motion-basics Exercise sheets on movements and forces prepared by the teacher.		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
7. Movement and forces.		February-March
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB 5, I1	1 to 6	1.1 1.2. 2.1 2.2. 3.1. 3.2. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work, Scientific challenge. Laboratory practice and/or simple experiments. Live worksheets. Activities from unit 7 of the textbook. Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Online simulator forces and movements:https://phet.colorado.edu/es/simulations/forces-and-motion-basics Exercise sheets on movements and forces prepared by the teacher.		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
8. Electricity		APRIL
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB 5 I2	1 to 6	1.1 1.2. 2.1 2.2. 3.1. 3.2. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work, Electricity exercise sheets prepared by the teacher. Laboratory practice and/or simple experiments. Live worksheets. Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Online load and field simulator:https://phet.colorado.edu/es/simulations/charges-and-fields Activities from unit 8 of the textbook. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
9. The energy		MAY
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB 5 E1 E2	1 to 6	1.1 1.2. 2.1 2.2. 3.1. 3.2. 4.1. 4.2. 5.1. 6.1.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Laboratory practice and/or simple experiments. Live worksheets. Activities from unit 9 of the textbook. Scientific challenge Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Exercise sheets on movements and forces prepared by the teacher.		

Cañada Blanch Spanish School Founded 1972	PHYSICS AND CHEMISTRY 4TH ESO
EXTRACT FROM THE 4th ESO PHYSICS AND CHEMISTRY TEACHING PROGRAM	

Below are the most important aspects of the FYQ 4th ESO course programming.

In 4th ESO, some of the aspects introduced in the 3rd ESO subject are studied in depth, reviewing and expanding on what was already studied in the previous year.
It should be noted that in 4th ESO the subject is optional and, therefore, students who take it must show a totally positive and proactive attitude towards it, since it has been their choice.

The work done in class, as well as the homework for the following day, will be posted on the Google Classroom platform every day.

My advice, which I will repeat over and over again, is to work on it DAY BY DAY.

SPECIFIC COMPETENCES:

1. Understand and relate the reasons why the main physicochemical phenomena of the environment occur, explaining them in terms of the appropriate scientific laws and theories, to solve problems in order to apply them to improve the nearby reality and the quality of human life.
2. Express the observations made by students in the form of questions, formulating hypotheses to explain them and demonstrating these hypotheses through scientific experimentation, inquiry and the search for evidence, in order to develop the reasoning inherent to scientific thinking and improve skills in the use of scientific methodologies.
3. Fluent in the basic rules and standards of physics and chemistry in relation to IUPAC language, mathematical language, the use of correct units of measurement, the safe use of the laboratory and the interpretation and production of data and information in different formats and sources, in order to recognise the universal and transversal nature of scientific language and the need for reliable communication in research and science between different countries and cultures.
4. Use digital platforms and various resources critically, efficiently and safely, both for individual and team work, to promote creativity, personal development and individual and social learning, through consulting information, creating materials and effective communication in different learning environments.
5. Use the strategies of collaborative work, promoting growth among equals as an entrepreneurial basis for a critical, ethical and efficient scientific community, to understand the importance of science in improving society, the applications and repercussions of scientific advances, the preservation of health and the sustainable conservation of the environment.
6. Understanding and valuing science as a collective construction in continuous change and evolution, in which not only the people dedicated to it participate, but which also requires interaction with the rest of society, to obtain results that impact technological, economic, environmental and social progress.

BASIC KNOWLEDGE

Basic scientific skills. DCB

1. Experimental work and research projects.
2. Various scientific learning environments and resources such as the laboratory or virtual environments: materials, substances and technological tools.
3. Rules for the use of each space, thus ensuring and protecting one's own and community health, network security and respect for the environment.
4. Scientific language: appropriate use of different unit systems and their symbols. Analysis of dimensions and expression of derived magnitudes based on fundamental magnitudes. Appropriate mathematical tools in different scientific and learning scenarios.

5. Strategies for interpreting and producing scientific information in different formats and media.
6. Assessment of scientific culture and the role of scientists in the main historical and current milestones of physics and chemistry for the advancement and improvement of society.

The matter. M

1. Material systems: problem solving and various learning situations about solutions and gases, among other significant material systems. Molarity of a solution. Ideal gas equation.
2. Atomic models: historical development. Electronic structure of atoms: electronic configuration of an atom and its relationship with its position in the periodic table and with its physicochemical properties.
3. Chemical compounds: their formation, physical and chemical properties and assessment of their usefulness and importance in other fields such as engineering or sport. Basic notions of ionic, covalent and metallic bonds.
4. Quantifying the amount of matter: concept of mole and calculation of the number of moles of material systems of different nature
5. Inorganic nomenclature: naming of simple substances, ions and binary and ternary chemical compounds using IUPAC standards.
6. Introduction to organic nomenclature: naming of monofunctional organic compounds based on IUPAC standards.

Energy. E

1. Energy: formulation and testing of hypotheses on the different forms, transformations and applications of energy, based on its properties and the principle of conservation.
2. Energy transfers: work and heat. Light and sound as waves that transfer energy. Energy degradation associated with energy transfers.
3. Energy in our world.

The interaction. I

1. Prediction and verification of the main magnitudes, equations and graphs that describe the motion of a body. MRU, MRUA, MCU.
2. Strength as an agent of change in bodies.
3. Vector nature of forces: basic vector algebra for solving problems related to systems subjected to sets of forces.
4. Main forces of the everyday environment: recognition of weight, normal, friction, tension or thrust, and their use in explaining physical phenomena in different real or simulated scenarios.
5. Law of universal gravitation: attraction between the bodies that make up the universe. Weight.
6. Forces and pressure in fluids: effects of forces and pressure on liquids and gases, studying the fundamental principles that describe them.

The change. C

1. Chemical equations: adjustment, stoichiometry, chemical industry.
2. Qualitative description of chemical reactions: combustion, neutralization and simple electrochemical processes. Factors that influence the speed of chemical reactions: Collision theory.

EVALUATION CRITERIA:

1. Specific competence 1.
   - **1.1.** Understand and rigorously explain everyday physicochemical phenomena based on appropriate scientific principles, theories and laws.
   - **1.2.** Solve the physicochemical problems posed by means of the appropriate scientific laws and theories, reasoning the procedures used to find the solutions and expressing the results correctly and precisely.
   - **1.3.** Recognize and describe real scientific problem situations.
2. Specific competence 2.
   - **2.1.** Use scientific methodologies to identify and describe scientific phenomena based on situations observed in the natural world and presented through statements with textual, graphical or numerical information.

2.2. Predict responses that can be verified with the tools and knowledge acquired, applying logical-mathematical reasoning in the validation process.
2.3. Apply the most important scientific laws and theories to validate hypotheses in an informed manner and consistent with existing scientific knowledge, designing procedures to resolve them and critically analyzing the results.

3. Specific competence 3.
3.1. Use a variety of reliable and safe sources to select, interpret, organize and communicate information related to a specific physicochemical process.
3.2. Properly use the basic rules of physics and chemistry, such as the use of units, mathematical tools, and advanced nomenclature rules.
3.3. Strictly apply the rules for the use of specific science spaces.

4. Specific competence 4.
4.1. Efficiently use a variety of resources, both traditional and digital.
4.2. Work in a versatile way with a variety of traditional and digital media.

5. Specific competence 5.
5.1. Establish constructive and coeducational interactions typical of collaborative work.
5.2. Undertake, autonomously and in accordance with the appropriate methodology, scientific projects.

6. Specific competence 6.
6.1. Recognize and value, through historical analysis of scientific advances achieved by women and men, that science is a process in permanent construction and that this has important repercussions and implications on today's society.
6.2. Detect the most important technological, environmental, economic and social needs that society demands, understanding the capacity of science to provide solutions.

Below are the different programming units that will be studied during the 4th ESO course. The following observations are valid for all of them.

- The timing is indicative and depends on the progress of the course in each case, and may be modified at the discretion of the teacher.
- Regarding the assessment instruments: this does not mean that each and every one of those mentioned in the different programming units/learning situations will be used obligatorily. Those that can be used are indicated, something that will be adapted to the diversity of each group and each student.
- The percentages assigned to each assessment criterion are all equal, i.e. if a programming unit has 10 assessment criteria, each of them will have a percentage of 10%, or if another unit has 7 assessment criteria, the weighting of each of them will be 100/7%. This generalisation can be modified throughout the year depending on the characteristics of the class group.
- The evaluation grade will be obtained from the arithmetic mean of the grades obtained in the programming units indicated in the tables corresponding to each of the subjects, taking into account the units developed throughout the evaluation.
- In addition, the possibility of increasing the final evaluation grade by 0.5 is proposed for the first two students in the class who solve the scientific challenge posed each month (except in exceptional cases). This Scientific Challenge, which has already been developed during the last two courses and is therefore known to the students, can be based on the following evaluation criteria: 1.1., 1.2., 2.1., 2.2., 2.3., 3.1., 3.2., 4.1., 4.2., 6.1.

The 4th ESO Physics and Chemistry programming units are the following:

TEACHING UNITS / LEARNING SITUATIONS		TIMING
1. The atom		September-October
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB6 M2 M3 M5	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 5.2. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Scientific challenge. Model or timeline of the atom. Live worksheets. Notes prepared by the teacher. Online simulator:https://phet.colorado.edu/sims/html/build-an-atom/latest/build-an-atom_es.html Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
2. The chemical bond		October-November
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB6 M2 M3 M5	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 5.2. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Scientific challenge. Model or timeline of the atom. Chemical bond exercises. Chemical bond infographic. Live worksheets. Notes prepared by the teacher. Online simulator: Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
3. Chemical reactions		November-December-January
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB6 M2 M3 M4 M5 C1 C2	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 5.2. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Exercises on formulation, adjustment and classification of chemical reactions. Scientific challenge. Laboratory practice. Live worksheets. Chemical equations adjustment simulator:https://phet.colorado.edu/sims/html/balancing-chemical-equations/latest/balancing-chemical-equations_es_ES.html Genially adjusted reactions:https://view.genial.ly/5e0f22afa2f46b0f5732c439/game-reacciona-a-la-caida Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Notes prepared by the teacher.		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
4. Organic Chemistry		January-February
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB6 M6	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 5.2. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Exercises on formulation, adjustment and classification of chemical reactions. Scientific challenge. Laboratory practice. Live worksheets. Simulator, create your own molecule: https://biomodel.uah.es/en/DIY/JSME/draw.es.htm Genially chemical Martians: https://view.genial.ly/61e495c08903e60cef15d4da/interactive-content-juego-quimica-organica Genially organic chemistry, quizz:https://view.genial.ly/65106eb1b85e11001131b79a/game-quimica-organica-unit-1 Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Notes prepared by the teacher.		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
5. Kinematics		March
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB6, I1	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 5.2. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Movement exercises: MRU, MRUA, MCU. Live worksheets. Notes prepared by the teacher. Scientific challenge Online simulator:https://www.walter-fendt.de/html5/phes/acceleration_en.htm Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
6. Dynamic		April-May
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB 1 to DCB6 I2 to I7	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 5.2. 6.1. 6.2.

EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.
Controls, Kahoot, Notebook, Exam,Classroom work. Exercises on vector addition of forces. Newton's Laws Exercises. Inclined plane exercises. Notes prepared by the teacher. Newton's Law of Universal Gravitation exercises. Live worksheets. Scientific challenge Online summation of forces simulator:https://www.walter-fendt.de/html5/phes/resultant_en.htm. Forces simulator:https://phet.colorado.edu/es/simulations/forces-and-motion-basics Educational games:www.edcaplay.com,www.cerebriti.com

TEACHING UNITS / LEARNING SITUATIONS		TIMING
7. Work and energy		May-June
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
DCB to DCB6 I1 E1 E2 E3	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 3.3. 4.1. 4.2. 5.1. 5.2. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Kahoot, Notebook, Exam,Classroom work. Mechanical energy exercises. Mechanical energy conservation exercises. Work exercises. Live worksheets. Online summation of forces simulator:https://www.walter-fendt.de/html5/phes/resultant_en.htm. Forces simulator:https://phet.colorado.edu/es/simulations/forces-and-motion-basics Educational games:www.edcaplay.com,www.cerebriti.com Notes prepared by the teacher. Scientific challenge		

Cañada Blanch Spanish School Founded 1972	PHYSICS AND CHEMISTRY 1 BTO

EXTRACT FROM THE TEACHING PROGRAM OF PHYSICS AND CHEMISTRY 1º BTO

Below are the most important aspects of the FYQ 1º BTO course programming.

In 1st BTO, some of the aspects introduced in the 4th ESO subject are explored in depth, reviewing and expanding on what has already been studied in the previous year.
It should be noted that in 1st BTO the subject is optional and, therefore, students who take it must show a totally positive and proactive attitude towards it, since it has been their choice.

The work done in class, as well as the homework for the following day, will be posted on the Google Classroom platform every day.

My advice, which I will repeat over and over again, is to work on it DAY BY DAY.

SPECIFIC COMPETENCES:

1. Solve problems and situations related to physics and chemistry, applying the appropriate scientific laws and theories, to understand and explain natural phenomena and demonstrate the role of these sciences in improving common well-being and in everyday reality.
2. Reason competently, using scientific thinking and skills related to the work of science, to apply it to the observation of nature and the environment, to the formulation of questions and hypotheses and to their validation through experimentation, inquiry and the search for evidence.
3. To properly and competently manage the flow of information in the different registers of scientific communication such as the nomenclature of chemical compounds, the use of mathematical language, the correct use of units of measurement, security in experimental work, for the production and interpretation of information in different formats and from diverse sources.
4. Use digital platforms and various resources autonomously, critically and efficiently, both for individual and team work, consulting and selecting reliable scientific information, creating materials in various formats and communicating effectively in different learning environments, to promote creativity, personal development and individual and social learning.
5. Work collaboratively in diverse teams, applying skills of coordination, communication, entrepreneurship and balanced sharing of responsibilities, to predict the consequences of scientific advances and their influence on one's own and community health and on sustainable environmental development.
6. Participate actively in the collective and evolutionary construction of scientific knowledge, in their daily and close environment, to become active agents in the dissemination of scientific thought, the skeptical approach to scientific and technological information and the appreciation of the preservation of the environment and public health, economic development and the search for an egalitarian society.

BASIC KNOWLEDGE

Chemical bonding and structure of matter: EQEM

1. Development of the periodic system.
2. Electronic structure of atoms. External electron configuration: explanation of the position of an element in the periodic table and the similarity in the properties of the chemical elements of each group.
3. Theories on the stability of atoms and ions: Prediction of the formation of bonds between elements, representation of these and deduction of the properties of chemical substances.
4. Nomenclature of simple substances, ions and inorganic chemical compounds: composition and applications in everyday life.

Chemical reactions: RQ

1. Fundamental laws of chemistry: stoichiometric relationships in chemical reactions and in the composition of compounds.
2. Classification of chemical reactions.
3. Calculation of quantities of matter in specific physicochemical systems, such as ideal gases or solutions and their properties. Ways of expressing concentration: molality and molar fraction.
4. Stoichiometry of chemical reactions.

Organic Chemistry: QO

1. General physical and chemical properties of organic compounds from the chemical structures of their functional groups.
2. IUPAC rules for formulating and correctly naming some mono- and polyfunctional organic compounds (hydrocarbons, oxygenated compounds and nitrogenous compounds).

Kinematics: C

1. Kinematic variables as a function of time in the different movements that an object can have, with or without external forces.
2. MRU, MRUA, MCU
3. Relationship of the trajectory of a compound movement with the magnitudes that describe it.

Static and dynamic: ED

1. Prediction, from vector composition, of the static or dynamic behavior of a particle and a rigid solid under the action of a pair of forces.
2. Relationship of vector mechanics applied to a particle with its state of rest or motion.
3. Interpretation of the laws of dynamics in terms of magnitudes such as linear momentum and mechanical impulse.
4. Energy. Concepts of work and power.
5. Potential energy and kinetic energy of a simple system: application to the conservation of mechanical energy in conservative and non-conservative systems.
6. Thermodynamic variables of a system depending on the conditions: temperature variations it experiences and the energy transfers that occur with its environment.

EVALUATION CRITERIA:

1. Specific competence 1.
- **1.1.** Apply scientific laws and theories in the analysis of everyday physicochemical phenomena, understanding the causes that produce them.
- **1.2.** Solve physical-chemical problems based on everyday situations, applying appropriate scientific laws and theories.
- **1.3.** Identify problematic situations in everyday life.

2. Specific competence 2.
- **2.1.** Formulate and verify hypotheses as responses to different problems and observations, handling experimental work, inquiry, the search for evidence and logical-mathematical reasoning with ease.
- **2.2.** Integrate known scientific laws and theories in the development of the validation procedure for the formulated hypotheses, applying qualitative and quantitative relationships between the different variables.

3. Specific competence 3.
- **3.1.** Use and rigorously relate different unit systems, correctly employing their notation and equivalences.
- **3.2.** Correctly name and formulate simple substances, ions and inorganic and organic chemical compounds using IUPAC standards.
- **3.3.** Use different formats to interpret and express information related to a specific physicochemical process.
- **3.4.** Put into practice the knowledge acquired in scientific experimentation in laboratories, including knowledge of their materials and their basic regulations for use, as well as the safety regulations specific to these spaces.

4. Specific competence 4.
  4.1. Interact with other members of the educational community through different learning environments, real and virtual.
  4.2. Work independently and in a versatile manner, individually and in a team, in consulting information and creating content.
5. Specific competence 5.
  5.1. Actively participate in the construction of scientific knowledge.
  5.2. Build and produce knowledge through collective work.
  5.3. To debate, in an informed and reasoned manner, the different environmental, social and ethical issues related to the development of science.
6. Specific competence 6.
  6.1. Identify and scientifically argue the repercussions of the actions that the student undertakes in his or her daily life.
  6.2. Detect the needs of society to which appropriate scientific knowledge can be applied to help improve it.

Below are the different programming units that will be studied during the 1st BTO course. The following observations are valid for all of them.

- The timing is indicative and depends on the progress of the course in each case, and may be modified at the discretion of the teacher.
- Regarding the assessment instruments: this does not mean that each and every one of those mentioned in the different programming units/learning situations will be used obligatorily. Those that can be used are indicated, something that will be adapted to the diversity of each group and each student.
- The percentages assigned to each assessment criterion are all equal, i.e. if a programming unit has 10 assessment criteria, each of them will have a percentage of 10%, or if another unit has 7 assessment criteria, the weighting of each of them will be 100/7%. This generalisation can be modified throughout the year depending on the characteristics of the class group.
- The evaluation grade will be obtained from the arithmetic mean of the grades obtained in the programming units indicated in the tables corresponding to each of the subjects, taking into account the units developed throughout the evaluation.
- In addition, the possibility of increasing the final evaluation grade by 0.5 is proposed for the first two students in the class who solve the scientific challenge posed each month (except in exceptional cases). This Scientific Challenge, which has already been developed during the last two courses and is therefore known to the students, can be based on the following evaluation criteria: 1.1., 1.2., 1.3., 2.1., 2.2., 2.3., 3.1., 3.2., 3.3, 3.4., 4.2., 6.1.

The 1st BTO Physics and Chemistry programming units are as follows:

TEACHING UNITS / LEARNING SITUATIONS		TIMING
1. The atom		September
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
EQEM 1 EQEM 2 EQEM 3 EQEM 4	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 3.1. 3.2. 3.3. 3.4. 4.1. 4.2. 5.1. 5.2. 5.3. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work. Model or timeline of the atom. Live worksheets. Online simulator:https://phet.colorado.edu/sims/html/build-an-atom/latest/build-an-atom_es.html Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Notes prepared by the teacher. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
2. The periodic table		October
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
EQEM 1 EQEM 2 EQEM 3 EQEM 4	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 3.1. 3.2. 3.3. 3.4. 4.1. 4.2. 5.1. 5.2. 5.3. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work. Games about the periodic table: memory, bingo, double, etc., created by the teacher. Laboratory practice and/or simple experiments. Live worksheets. Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Online simulator: atom builderhttps://phet.colorado.edu/es/simulations/build-an-atom Notes prepared by the teacher. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
3. The chemical bond		November
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
EQEM 1 EQEM 2 EQEM 3 EQEM 4	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 3.1. 3.2. 3.3. 3.4. 4.1. 4.2. 5.1. 5.2. 5.3. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work. Model or timeline of the atom. Chemical bond exercises, Chemical bond infographics. Laboratory practice and/or simple experiments. Live worksheets. Formulation and nomenclature exercises prepared by the teacher. Notes prepared by the teacher. Scientific challenge Online simulator:Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
4. Chemical reactions		December/January
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
EQEM 1 EQEM 2 EQEM 3 EQEM 4 RQ1 RQ2 RQ3 RQ4	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 3.1. 3.2. 3.3. 3.4. 4.1. 4.2. 5.1. 5.2. 5.3. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work. Exercises on formulation, adjustment and classification of chemical reactions. Laboratory practice and/or simple experiments. Live worksheets. Chemical equations adjustment simulator:https://phet.colorado.edu/sims/html/balancing-chemical-equations/latest/balancing-chemical-equations_es_ES.html Genially adjusted reactions:https://view.genial.ly/5e0f22afa2f46b0f5732c439/game-reacciona-a-la-caida Online educational games:www.educacplus.org,www.educaplay.com,www.cerebriti.com Notes prepared by the teacher. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
5. Organic Chemistry		January/February
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
QO1 QO2	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 3.1. 3.2. 3.3. 3.4. 4.1. 4.2. 5.1. 5.2. 5.3. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work. Laboratory practice and/or simple experiments, Live worksheets. Formulation and organic chemical nomenclature exercises prepared by the teacher. Online simulator:Online educational games:www.educacplus.org,www.edcaplay.com,www.cerebriti.com Notes prepared by the teacher. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
6. Kinematics		March/April
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
C1 C2 C3	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 3.1. 3.2. 3.3. 3.4. 4.1. 4.2. 5.1. 5.2. 5.3. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work. Live worksheets. Laboratory practice and/or simple experiments. Notes prepared by the teacher. Scientific challenge Movement exercises developed by the teacher: MRU, MRUA, parabolic shot, MCU. Mov simulator:https://phet.colorado.edu/sims/html/projectile-motion/latest/projectile-motion_es.html Educational games:www.edcaplay.com,www.cerebriti.com		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
7. Dynamic		April/May
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
C1 C2 C3 ED1 ED2 ED3	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 3.1. 3.2. 3.3. 3.4. 4.1. 4.2. 5.1. 5.2. 5.3. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work. Live worksheets. Laboratory practice and/or simple experiments. Notes prepared by the teacher. Scientific challenge Force exercises: calculation of resultants, Newton's laws, inclined plane, statics. Online simulator of vector sum of forces:https://www.fisicalab.com/apartado/fuerza-resultante Educational games:www.edcaplay.com,www.cerebriti.com		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
8. Work and energy		May/June
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
C1 C2 C3 ED1 ED2 ED3 ED4 ED5 ED6	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 3.1. 3.2. 3.3. 3.4. 4.1. 4.2. 5.1. 5.2. 5.3. 6.1. 6.2.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work. Live worksheets. Laboratory practice and/or simple experiments. Notes prepared by the teacher. Scientific challenge Educational games:www.edcaplay.com,www.cerebriti.com		

Cañada Blanch Spanish School Founded 1972	PHYSICS AND CHEMISTRY CHEMISTRY 2 BTO
EXTRACT FROM THE 2nd BTO CHEMISTRY TEACHING PROGRAM	

Below are the most important aspects of the 2º BTO CHEMISTRY course programming.

In 2nd BTO, we delve deeper into aspects introduced in the 1st ESO subject, and delve deeper into specific chemical processes such as neutralization reactions and REDOX.
It should be noted that in 2nd BTO the subject is optional and, therefore, students who take it must show a totally positive and proactive attitude towards it, since it has been their choice.
During the course, students are prepared to take the university entrance exam.

The work done in class, as well as the homework for the following day, will be posted on the Google Classroom platform every day.

My advice, which I will repeat over and over again, is to work on it DAY BY DAY.

SPECIFIC COMPETENCES:

1. Understand, describe and apply the fundamentals of the most important chemical processes, taking into account their experimental basis and the phenomena they describe, to recognize the relevant role of chemistry in the development of society.
2. Adopt the accepted models and laws of chemistry as a basis for studying the properties of material systems, in order to infer general solutions to everyday problems related to the practical applications of chemistry and its impact on the environment.
3. Correctly use the codes of chemical language (chemical nomenclature, units, equations, etc.), applying their specific rules, to use them as a basis for adequate communication between different scientific communities and as a fundamental tool in the research of this science.
4. Recognize the importance of the responsible use of chemical products and processes, developing informed arguments about the positive influence that chemistry has on today's society, in order to help overcome the negative connotations that are often attributed to the term "chemical."
5. Apply working techniques specific to experimental sciences and logical-mathematical reasoning in solving chemistry problems and in interpreting related situations, valuing the importance of cooperation, to highlight the role of chemistry in a society based on ethical and sustainable values.
6. Recognize and analyze chemistry as a multidisciplinary and versatile area of knowledge, highlighting the relationships with other sciences and fields of knowledge, in order to carry out a holistic approach to scientific and global knowledge.

BASIC KNOWLEDGE

Chemical bonding and structure of matter: EQEM
Atomic spectra.

1. Atomic spectra as experimental evidence of the need to revise the atomic model. Relevance of this phenomenon in the context of the historical development of the atomic model.
2. Interpretation of emission and absorption spectra of elements. Relationship with the electronic structure of the atom.

Quantum principles of atomic structure: PCEA

1. Relationship between the phenomenon of atomic spectra and the quantization of energy. From the Bohr model to quantum mechanical models: the need for an electronic structure at different levels. Heisenberg's uncertainty principle and the dual wave-particle nature of the electron. Probabilistic nature of the orbital concept.
2. Quantum numbers. Aufbau, Hund and Pauli principles. Electronic structure of the atom. Use of the Moeller diagram to write the electronic configuration of chemical elements.

Periodic table and properties of atoms. Forces between atoms: SP

1. Experimental nature of the origin of the periodic table in terms of the grouping of elements according to their properties. Current atomic theory and its relationship to observed experimental laws.
2. Position of an element in the periodic table based on its electron configuration.
3. Periodic trends. Application to the prediction of the values of the properties of the elements of the table from their position in the table.
4. Applications and risks associated with some chemical elements. Similarities based on their position in the periodic table.
5. Chemical bonding and intermolecular forces.
6. Types of bonds based on the characteristics of the individual elements that form them. Energy involved in the formation of molecules, crystals and macroscopic structures. Properties of chemical substances.
7. Lewis models, VSEPR and orbital hybridization. Geometric configuration of molecular compounds and the characteristics of solids.
8. Born-Haber cycle. Energy exchanged in the formation of ionic crystals.
9. Electron cloud models and band theory to explain the characteristic properties of metallic crystals.
10. Intermolecular forces based on the characteristics of the chemical bond and the geometry of the molecules. Properties of molecular compounds based on the analysis of these forces.

Chemical reactions: RQ

Thermodynamicschemistry.

1. First principle of thermodynamics: energy exchanges between systems through heat and work.
2. Chemicals as sources of energy. Thermochemical equations.
3. Concept of reaction enthalpy. Endothermic and exothermic processes.
4. Energy balance between products and reactants using Hess's law, through the standard enthalpy of formation or the bond energies, to obtain the enthalpy of a reaction. Enthalpy diagrams.
5. Second and third principles of thermodynamics. Entropy as a magnitude that affects the spontaneity and irreversibility of chemical processes.
6. Calculation of the Gibbs energy of chemical reactions and their spontaneity as a function of the temperature of the system.

Chemical kinetics.

7. Collision theory as a microscopic model of chemical reactions. Concepts of reaction rate and activation energy.
8. Influence of reaction conditions on reaction rate. Practical applications.
9. Differential law of the rate of a chemical reaction and determination of reaction orders from experimental data on reaction rates.

Chemical equilibrium.

10. Chemical equilibrium as a dynamic process: rate equations and thermodynamic aspects. Expression of the equilibrium constant by the law of mass action.
11. The equilibrium constant of reactions in which the reactants are in different physical states. Relationship between KC and KP and solubility product in heterogeneous equilibria. Le Châtelier's principle and the reaction quotient.

Acid-base reactions.

12. Acidic or basic character of a substance based on the theories of Arrhenius, Brønsted and Lowry.
13. Strong and weak acids and bases. Degree of dissociation in aqueous solution.
14. pH of acidic and basic solutions. Expression of the constants Ka and Kb.
15. Concept of conjugate acid-base pairs. Acidic or basic character of solutions in which hydrolysis of a salt occurs.
16. Reactions between acids and bases. Concept of neutralization. Acid-base titrations.
17. Acids and bases relevant in everyday life, at industrial and consumer levels, with special impact on the process of environmental conservation.

Redox reactions.

18. Oxidation state. Species that are reduced or oxidized due to a change in their oxidation number.
19. Ion-electron method for balancing oxidation-reduction chemical equations.
20. Stoichiometric calculations and redox titrations.
21. Standard potential of a redox couple. Spontaneity of chemical and electrochemical processes involving two redox couples.
22. Faraday's laws: the amount of electric charge and the quantities of substance in an electrochemical process. Stoichiometric calculations in electrolytic cells.

23. Oxidation and reduction reactions in the manufacture and operation of electric batteries, electrolytic cells and fuel cells, as well as in the prevention of metal corrosion. Chemical substances as sources of electrical energy.

Organic Chemistry: QO

Isomerism.

1. Molecular and expanded formulas of organic compounds. Structural isomerism.
2. Molecular models or 3D representation techniques for molecules. Spatial isomers of a compound and their properties. Applications in the field of biochemistry.

Organic reactivity.

3. Main chemical properties of the different organic functions.
4. Behavior in solution or in chemical reactions.
5. Main types of organic reactions: addition, substitution, elimination and condensation. Reaction mechanisms and intermediates. Reaction products between organic compounds and the corresponding chemical equations.

Polymers.

6. Process of forming polymers from their corresponding monomers.
7. Structure and properties.
8. Classification of polymers according to their nature, structure and composition.
9. Applications, properties and associated environmental risks.

EVALUATION CRITERIA:

1. Specific competence 1.
- **1.1.** Recognize the importance of chemistry and its connections with other areas in the development of society, the progress of science, technology, economy and sustainable development that respects the environment.
- **1.2.** Describe the main chemical processes that occur in the environment and the properties of material systems based on chemistry.
- **1.3.** Recognize the experimental and interdisciplinary nature of chemistry and its influence on scientific research and on current economic and labor fields, considering empirical facts and their applications in other fields of knowledge and human activity.

2. Specific competence.
- **2.1.** Relate the principles of chemistry to the main current problems associated with the development of science and technology, analyzing how they are communicated through the media or observed in everyday experience.
- **2.2.** Recognize and communicate that the foundations of chemistry constitute an essential body of knowledge in different fields.
- **2.3.** Apply in an informed, coherent and reasoned manner the models and laws of chemistry, natural phenomena, industrial processes and scientific discoveries.

3. Specific competence 3.
- **3.1.** Correctly use IUPAC nomenclature standards.
- **3.2.** Rigorously use the necessary mathematical tools. Practice and enforce safety regulations related to the handling of chemical substances, as well as the correct management and disposal of waste, using the communication codes of chemistry.

4. Specific competence 4.
- **4.1.** Analyze the chemical composition of the material systems of the environment.
- **4.2.** Applying the theories and laws of chemistry, argue the relationship between the negative effects of certain substances on the environment and health and negligent practices.
- **4.3.** Explain, using appropriate scientific language and terms, the benefits of the many products of chemical technology.

5. Specific competence 5.
- **5.1.** Recognize the important contribution to chemistry of collaborative work between specialists from different scientific disciplines, relating the laws and theories of each of them.
- **5.2.** Recognize the contribution of chemistry to the development of scientific thought.
- **5.3.** Solve problems related to chemistry and study situations related to it.
- **5.4.** Efficiently represent and visualize chemistry concepts, using digital tools and various resources, including real and virtual laboratory experiences.

6. Specific competence 6.

6.1. Explain and reason the fundamental concepts that are at the base of chemistry by applying the concepts, laws and theories of other scientific disciplines (especially physics)

6.2. Deduce the fundamental ideas of other scientific disciplines, such as biology or technology, and relate them to the laws and theories that are specific to chemistry.

6.3. Solve problems and issues that are characteristic of chemistry using the tools provided by mathematics and technology.

Below are the different programming units that will be studied during the 2nd BTO chemistry course. The following observations are valid for all of them.

- The timing is indicative and depends on the progress of the course in each case, and may be modified at the discretion of the teacher.
- Regarding the assessment instruments: this does not mean that each and every one of those mentioned in the different programming units/learning situations will be used obligatorily. Those that can be used are indicated, something that will be adapted to the diversity of each group and each student.
- The percentages assigned to each assessment criterion are all equal, i.e. if a programming unit has 10 assessment criteria, each of them will have a percentage of 10%, or if another unit has 7 assessment criteria, the weighting of each of them will be 100/7%. This generalisation can be modified throughout the year depending on the characteristics of the class group.
- The evaluation grade will be obtained from the arithmetic mean of the grades obtained in the programming units indicated in the tables corresponding to each of the subjects, taking into account the units developed throughout the evaluation.
- In addition to this, the possibility of raising the final evaluation grade by 0.5 is proposed for the first two students in the class (except in exceptional cases) who solve the scientific challenge posed each month. This Scientific Challenge, which has already been developed during the last two courses and is therefore known to the students, can be based on the following evaluation criteria: 1.1., 1.2., 1.3., 2.1., 2.2., 2.3., 3.1., 3.2., 4.1., 4.2., 4.3., 5.1., 5.3., 5.4., 6.1., 6.2., and 6.3.

The 2nd BTO Chemistry programming units are as follows:

TEACHING UNITS / LEARNING SITUATIONS		TIMING
1. Review previous concepts		September
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
SP2 SP5 RQ18	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 4.1. 4.2. 4.3. 5.1. 5.2. 5.3. 5.4. 6.1. 6.2. 6.3.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work Tests similar to those proposed in the EBAU: tests and problems. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
2. The atom		September-October
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
EQEM 1 EQEM 2 EQEM 3 EQEM 4	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 4.1. 4.2. 4.3. 5.1. 5.2. 5.3. 5.4. 6.1. 6.2. 6.3.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work Tests similar to those proposed in the EBAU: tests and problems. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
3. The periodic table		October
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
EQEM 5 EQEM 6 EQEM 7 EQEM 8	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 4.1. 4.2. 4.3. 5.1. 5.2. 5.3. 5.4. 6.1. 6.2. 6.3.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work Tests similar to those proposed in the EBAU: tests and problems. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
4. The chemical bond		October-November
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
EQEM 9 EQEM 10 EQEM 11 EQEM 12 EQEM 13 EQEM 14	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 4.1. 4.2. 4.3. 5.1. 5.2. 5.3. 5.4. 6.1. 6.2. 6.3.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work Tests similar to those proposed in the EBAU: tests and problems. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
5. Chemical kinetics		November
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
RQ7 RQ8 RQ9	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 4.1. 4.2. 4.3. 5.1. 5.2. 5.3. 5.4. 6.1. 6.2. 6.3.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work Tests similar to those proposed in the EBAU: tests and problems. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
6. Chemical equilibrium		December-January
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
RQ10 RQ11	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 4.1. 4.2. 4.3. 5.1. 5.2. 5.3. 5.4. 6.1. 6.2. 6.3.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work Tests similar to those proposed in the EBAU: tests and problems. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
7. Proton transfer reactions		January-February
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
RQ12 RQ13 RQ14 RQ15 RQ16 RQ17	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 4.1. 4.2. 4.3. 5.1. 5.2. 5.3. 5.4. 6.1. 6.2. 6.3.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work Tests similar to those proposed in the EBAU: tests and problems. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
8. Electron transfer reactions		March
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
RQ18 RQ19 RQ20 RQ21 RQ22 RQ23	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2 4.1. 4.2. 4.3. 5.1. 5.2. 5.3. 5.4. 6.1. 6.2. 6.3.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work Tests similar to those proposed in the EBAU: tests and problems. Scientific challenge		

TEACHING UNITS / LEARNING SITUATIONS		TIMING
9. Organic chemistry.		April
BASIC KNOWLEDGE	**SPECIFIC COMPETENCES and Operational Descriptors**	**EVALUATION CRITERIA**
QO1 QO2 QO3 QO4 QO5 QO6 QO7 QO8 QO9	1 to 6	1.1. 1.2. 1.3. 2.1. 2.2. 2.3. 3.1. 3.2. 4.1. 4.2. 4.3. 5.1. 5.2. 5.3. 5.4. 6.1. 6.2. 6.3.
EVALUATION INSTRUMENTS: Tasks, final products, rubrics, etc.		
Controls, Notebook, Exam,Classroom work Tests similar to those proposed in the EBAU: tests and problems. Scientific challenge		