

Contents. Biology and Geology 4.º ESO

APPENDIX. Scientific work

BLOCK I		
ORIGIN, DYNAMICS AND HISTORY OF THE EARTH		
UNIT	CONTENT	FINAL SECTIONS
1 Earth in the Universe	<ol style="list-style-type: none"> 1. The origin of the Universe 2. Characteristics and components of the Solar System 3. Origin of the Earth and layer differentiation 4. The changing surface of the Earth 5. External geological hazards 	Revision activities Science practical Detecting exoplanets with the transit method
		Work on your key competences LS Is there a planet B in the solar system?
2 Plate tectonics	<ol style="list-style-type: none"> 1. Studying the internal structure of Earth 2. Geochemical and geodynamic Earth models 3. The origins of plate tectonics 4. Types of plate boundaries and their movements 5. Internal geological hazards 	Revision activities Science practical Testing a scientific hypothesis: Hot spots
		Work on your key competences LS Where the Earth trembles
3 The history of Earth	<ol style="list-style-type: none"> 1. The changing Earth 2. Calculating geological time: Dating 3. Fossils 4. Absolute dating 5. The great divisions of the Earth's history 	Revision activities Science practical A timeline of the Phanerozoic eon
		Work on your key competences LS Mass extinctions
PROJECT I LS	The Earth: home of life	
BLOCK II		
ORIGIN, MAINTENANCE AND EVOLUTION OF LIFE		
4 The origin of life	<ol style="list-style-type: none"> 1. What is life? 2. The origin of life 3. First living things 4. Conditions that make the Earth habitable 5. Astrobiology 	Revision activities Science practical Simulating the formation of coacervates
		Work on your key competences LS Science-fiction
5 Cells	<ol style="list-style-type: none"> 1. Parts of a cell and their functions 2. Types of cells 3. Prokaryotic cells 4. Eukaryotic cells 5. The cell cycle 6. Cell division 	Revision activities Science practical Under the microscope: observing the phases of mitosis
		Work on your key competences LS Cell modelling
6 Molecular genetics	<ol style="list-style-type: none"> 1. Nucleic acids 2. DNA 3. Gene expression 4. The genetic code 5. Genetic engineering 	Revision activities Science practical DNA extraction
		Work on your key competences LS The Human Genome and ENCODE projects

UNIT	CONTENT	FINAL SECTIONS
7 Biological inheritance	<ol style="list-style-type: none"> 1. Genetics 2. Mendel's laws 3. Alterations to Mendel's laws 4. Chromosomes and inheritance 5. Sex inheritance 6. Applications of inheritance laws 	Revision activities Science practical Studying the distribution of a quantitative trait
		Work on your key competences LS Individual traits and human diversity
8 Human genetics	<ol style="list-style-type: none"> 1. The human karyotype 2. Mutations 3. Evolutionary significance of genetic variation 4. Genetic disorders 5. Congenital malformations 6. Diagnosis of genetic diseases 	Revision activities Science practical Making a karyotype
		Work on your key competences LS Cancer and the environment
9 Evolution of life	<ol style="list-style-type: none"> 1. From the first cell to biodiversity 2. The process of evolution 3. Evolutionary theories 4. Evidence of evolution 5. The appearance of humans 6. Phylogenetic trees 	Revision activities Science practical Building a phylogenetic tree
		Work on your key competences LS Timeline
PROJECT II LS	Sequence analysis and evolution	
BLOCK III	ECOSYSTEMS, ENVIRONMENT AND SUSTAINABILITY	
10 The structure and dynamics of ecosystems	<ol style="list-style-type: none"> 1. Ecosystems 2. Environmental factors 3. Adaptations of living things 4. Relationships between structure and function 5. Populations and their dynamics 6. Communities and their dynamics 7. Matter and energy in ecosystems 8. Ecosystem productivity 	Revision activities Science practical Calculating the size of a population
		Work on your key competences LS Adaptaciones de los organismos
11 Environment and sustainability	<ol style="list-style-type: none"> 1. The impact of human activities 2. Pollution 3. The overexploitation of resources 4. Loss of biodiversity 5. The energy problem 6. Waste management 7. Sustainability 	Revision activities Science practical Lichens as indicators of atmospheric pollution
		Work on your key competences LS Calculating the ecological footprint
PROJECT III LS	The environment of my neighbourhood	