



Enseignement secondaire		
Classes internationales		
	Régime anglophone	
Biologie		
Programme		
5IEC		
Leçons hebdomadaires: 2		
Langue véhiculaire: anglais		
Nombre minimal de devoirs par trimestre: 1		

Manuels scolaire : livre de 5^{ième} + livre de 4^{ième}

Theory

	<u>Topic</u>	<u>Contents</u>
1	Genetics, ecosystems and evolution	<ul style="list-style-type: none">• Identify different types of <u>environmental variation</u> and explain their causes• Explain how environmental variation can cause problems with classification• Identify different types of <u>inherited variation</u> (continuous and discontinuous)• Explain how sexual reproduction causes inherited variation• Identify a normal distribution• Outline how the structure of <u>DNA</u> was discovered• Explain the importance of DNA• Describe the relationship between chromosomes, DNA, genes, genetic information and nuclei • Illustrate how <u>genetic information can cause extinction</u> using a specific example• Review the general definitions: <u>biosphere, ecosystem, biotope, biocenosis, biotic and abiotic factors, species, population, habitat</u>• Describe <u>habitat</u> and <u>variation</u> as continuous or discontinuous• Identify and describe some <u>adaptations</u> for different habitats



		<ul style="list-style-type: none">• Explain how adaptations affect the survival of organisms and how they become endangered or extinct• Explain some ways of preserving biodiversity• Describe how inherited variation is caused• Identify causes of environmental variation• Describe adaptations to daily and seasonal changes• Describe ways in which organisms affect their habitats and communities• Describe how organisms compete• Outline Darwin's theory of <u>natural selection</u>• Outline the theory of Lamarck.• Explain how natural selection works on individuals, which vary genetically in a population• Illustrate the process of natural selection using specific examples
2	Unicellular organisms and diseases	<ul style="list-style-type: none">• Use cell features to identify members of <u>different kingdoms</u>• Explain differences between unicellular and multicellular organisms• Draw and annotate a typical <u>bacterial cell</u>• Describe the functions of the parts of a bacterial cell• Describe how bacteria reproduce• Explain the difference between <u>aerobic and anaerobic respiration</u> (in yeast and in humans)• Explain how to detect them - O₂ sensor, CO₂ sensor, limewater, hydrogen carbonate indicator• Explain why anaerobic bacteria are used to make yoghurt and cheese• Explain how yeasts are used in brewing and baking• Describe how yeasts reproduce• Identify different types of pathogens (bacteria, viruses, unicellular organisms)• Different types of viruses and associated diseases (e.g. HIV, COVID, ...)• Distinguish between infectious and inherited diseases• Combating infection: blood and defense against disease• Antibodies and the immune response• Immune system – macrophages, antibody production, B cells and T cells• Differentiate possibilities of treatment of disease – symptomatic treatments vs curative treatments• Explain how new medicines are tested to see that they are safe.• Explain how pandemics can be combatted <p><i>Workbook exercises:</i></p> <ul style="list-style-type: none">• <i>10.1 Food poisoning in the USA</i>



		<ul style="list-style-type: none">• 10.3 Eradicating polio
3	Plant growth	<ul style="list-style-type: none">• Explain specific <u>reactions in plants</u>: photosynthesis and aerobic respiration• Evaluate how the rate of photosynthesis can be affected• Describe how leaves, roots and stems are <u>adapted for their functions</u>• Explain how substances enter and leave plants• Transport and transpiration• Explain how and why <u>plants produce different substances</u>• Understand the importance of nitrates• Describe how pests and human populations alter <u>growing crops</u>• Explain ways in which farmers boost food production• Outline some ways in which plant varieties are created• Sensitivity in plants
4	Project	Group investigation on a topic of choice in preparation of personal projects

General skills:

- Accuracy and estimates
- Means and ranges
- Pie charts
- Probabilities

Practical Work - Examples

<u>Topic</u>	<u>Contents</u>
Microorganisms	<ul style="list-style-type: none">• Examine microorganisms in a hay infusion
Fermentation	<ul style="list-style-type: none">• Microscopic observation of <i>Lactobacillus bulgaricus</i> and <i>Streptococcus thermophilus</i>• Analyze the effect of temperature on anaerobic respiration in yeast
Use of microorganisms in technology	<ul style="list-style-type: none">• Visit a sewage station• Build a decomposition system (e.g. bottle biology)• Produce yoghurt
DNA	<ul style="list-style-type: none">• Build a DNA/chromosome model from everyday materials
Evolution	<ul style="list-style-type: none">• Museum visit• Online simulation on natural selection
Transport in plants	<ul style="list-style-type: none">• Determine transpiration rates using a simple potometer
Growing crops	<ul style="list-style-type: none">• Analyze the effect of different mineral substitutes on plant growth