



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

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

Theory

	<u>Topic</u>	<u>Contents</u>
		<ul style="list-style-type: none">• Use cell features to identify members of <u>different kingdoms</u>• Explain differences between unicellular and multicellular organisms• Explain the difference between <u>aerobic and anaerobic respiration</u> (in yeast and in humans)• Explain how yeasts are used in brewing and baking• Describe how yeasts reproduce• Explain why anaerobic bacteria are used to make yoghurt and cheese
1	Unicellular organisms	<ul style="list-style-type: none">• Draw and annotate a typical <u>bacterial cell</u>• Describe the functions of the parts of a bacterial cell• Describe how bacteria reproduce• Describe the functions of the common parts of <u>protocist cells</u> (paramecium, amoeba, chlamydomonas)• Describe how algae make their own food, and explain the importance of this• Explain the importance of <u>decomposers</u>• Model the recycling of carbon in an ecosystem using the <u>carbon cycle</u>



2	Genetics 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 • Explain how adaptations affect the survival of organisms and how they become endangered or extinct • Explain some ways of preserving biodiversity • 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
		<i>Application: Calculate probabilities and display them in different forms</i>
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 • 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 • Illustrate distinct <u>farming problems</u>: use models, e.g. food webs and the carbon cycle to explain changes in an ecosystem • Recognize the advantages and disadvantages of different farming methods
4	Ecosystems	<ul style="list-style-type: none"> • 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 • Describe how inherited variation is caused



		<ul style="list-style-type: none">• 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• Explain why <u>pesticides</u> need to be used carefully
5	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 photometer
Growing crops	<ul style="list-style-type: none">• Analyze the effect of different mineral substitutes on plant growth
Farming methods	<ul style="list-style-type: none">• Conference with a farming expert