





# France Educational Curriculum Alignment

*The presentations offered by The Educated Choices Program provide support for teaching and learning of the following standards:*

Biochemistry- tech path, specialist courses, High School	Environment and Modern Agriculture	Healthful Eating
<p>Thematic modules 01: Molecular and physiological mechanisms of nutrition</p> <p>Part A: Digestion</p>	<p>Know How to:</p> <ul style="list-style-type: none"> <li>● Identify the biomolecules that make up the food.</li> <li>● Determine needs               <ul style="list-style-type: none"> <li>○ Nutritional                   <ul style="list-style-type: none"> <li>■ quantitative</li> <li>■ qualitative.</li> </ul> </li> </ul> </li> <li>● Draw a representation of the tube organs</li> <li>● Present the digestion as a molecular simplification.</li> <li>● Distinguish between digestion mechanisms               <ul style="list-style-type: none"> <li>○ enzymatic</li> <li>○ chemical</li> <li>○ mechanical.</li> </ul> </li> <li>● Show that the digestion is dependent on microbial metabolism</li> <li>● Build a functional plan presenting the development of biomolecules in the digestive.</li> <li>● Explain the link between the structure of the intestinal wall, and its function of absorption, to all levels of organization.</li> <li>● Connect the nature of nutrients and their circulation in the middle</li> </ul>	


	<p>interior.</p> <ul style="list-style-type: none"> <li>● Schematize the storage and release of nutrients <ul style="list-style-type: none"> <li>○ hepatocytes</li> <li>○ adipocytes.</li> </ul> </li> <li>● Explain the roles of insulin and glucagon in the regulation of blood sugar.</li> </ul>		
Part B: Excretion	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Draw a representation of the urinary tract's organs</li> <li>● Identify the functional unit of formation of urine.</li> <li>● Illustrate the roles of the kidney in the elimination of water and metabolites.</li> <li>● Explain the mechanisms of formation of urine and their location.</li> <li>● Connect the structure of the renal corpuscle and its function as filtration.</li> <li>● Use a diagram to explain the mechanism of molecular reabsorption of glucose.</li> <li>● Use a simple diagram to explain the reabsorption of water regulated by the ADH.</li> </ul>		✓
<p>Thematic modules 02: Physiological and molecular mechanisms of reproduction and the transmission of hereditary characteristics</p> <p>Part D: Molecular Genetics</p>	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Use a support mechanism to explain the production of haploid gametes.</li> <li>● Identify each stage of cell differentiation in the training of gametes.</li> <li>● Describe the chronology of the fertilization process.</li> <li>● Show the chromosomal consequences of fertilization.</li> <li>● Use a drawing to explain how meiosis and fertilization allow the two kinds of chromosomal breeding.</li> <li>● Use an example to demonstrate or explain the relationship between genotype and phenotype at the molecular scale.</li> </ul>		✓


	<ul style="list-style-type: none"> <li>● Identify the mode of transmission of a hereditary character from a genealogy tree.</li> </ul>		
<p>Transversal modules A – Relationship between structures and properties of biomolecules</p>	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Identify the main chemical functions (alcohol, aldehyde, ketone, carboxylic acid, amine, amide, ester) associated with groups' features in a molecule.</li> <li>● Represent the semi-developed ring formula of D-glucose.</li> <li>● Compare semi-developed cyclical and linear formulas molecules of D-galactose, D-fructose, D-ribose, D-deoxyribose to that of D-glucose.</li> <li>● Identify the nature of the risk(s) in maltose, lactose, sucrose, starch and glycogen.</li> <li>● Represent the generic formula for an acid L-series <math>\alpha</math>-amino.</li> <li>● Explain the nature of asymmetries in an atom of <math>\alpha</math> carbon in an amino acid.</li> <li>● Schematize the primary structure of a peptide by highlighting the peptide bond.</li> <li>● Identify cysteine, valine, serine, lysine and glutamic acid.</li> <li>● Identify an amino acid hydrophobic within a protein.</li> <li>● Identify the nature of links involved in three-dimensional structure within a protein.</li> <li>● Locate the dare and phosphate group composing the nucleotides within a nucleic acid base.</li> <li>● Represent a nucleotide sequence by using letters' symbols for the nitrogenous bases.</li> <li>● Identify the common points and differences between a DNA molecule and a RNA molecule.</li> <li>● Explain the influence of physicochemical settings on the conformation of biomolecules.</li> <li>● Explain the role of hydrogen bonds between single-stranded nucleic</li> </ul>		

	<p>acids for their specific interaction.</p> <ul style="list-style-type: none"> <li>● Represent the semi-developed formula from a saturated fatty acid.</li> <li>● Represent the semi-developed formula from a monounsaturated fatty acid writing in official nomenclature.</li> <li>● Recognize the sterane kernel of a hormone steroid or fat-soluble vitamin.</li> <li>● Identify how a biomolecule area interacts with the water.</li> <li>● Plan the weak connections that settle with water.</li> <li>● Schematize a phospholipid.</li> <li>● Represent schematically a biological membrane in an aqueous environment.</li> <li>● Explain the functional difference between a receiver and a carrier.</li> </ul>		
B: Relations between structures and physiological functions	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Estimate the order of size of microscopic objects scale study.</li> <li>● Associate a type of waist microscope structure observed.</li> <li>● Explain the contribution organ roles at the device function.</li> <li>● Explain the link between the structure of an epithelial fabric and the function of the organ.</li> <li>● Schematize a eukaryotic cell with its organelles.</li> <li>● Describe the role of endoplasmic reticulum and the Golgi apparatus in link with their membranes' structures.</li> <li>● Explain the role of core in genetic hardware protection.</li> <li>● Connect the choice of medical imaging technology to observed nature tissue.</li> <li>● Differentiate on X-rays the soft tissue surrounding bones.</li> </ul>		✓
C: Internal environment and homeostasis	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Situate the different compartments of fluids in an organism.</li> <li>● Compare the composition of different fluid compartments in an</li> </ul>		✓



	<p>organism.</p> <ul style="list-style-type: none"> <li>● Map the route of a biomolecule in blood and lymphatic traffic.</li> <li>● Characterize a material transfer mechanism between two fluid compartments in an organism.</li> <li>● Identify the different elements of a regulation loop in the maintenance department of homeostasis.</li> </ul>		
D: Information and communication	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Show that the properties of information about nucleic acids are related to their primary structure.</li> <li>● Schematize the main steps of the synthesis of protein from DNA.</li> <li>● Determine the consequence of a mutation of a DNA nucleotide sequence on the peptide sequence.</li> <li>● Explain the terms of DNA breakdown during mitosis.</li> <li>● Draw a curve representing the amount of DNA genomics in the function phase of the cell cycle</li> <li>● Explain the terms of DNA breakdown during meiosis.</li> <li>● Draw a curve representing the amount of DNA genomics in the function phase of the cell cycle</li> <li>● Explain the general organization of a Communication lane.</li> <li>● Make a diagram highlighting the main actors of hormonal communication.</li> <li>● Identify the characteristics of a hormone.</li> <li>● Specify the mode of action of a hydrophilic hormone and of a hydrophobic hormone to target cell scales.</li> <li>● Schematize a hormonal control loop secretion.</li> <li>● Identify, in a loop, the type of regulation indicating activations and inhibitions.</li> </ul>		✓


Biotechnology- tech path, specialist courses, High School		Environment and Modern Agriculture	Healthful Eating
A: Learn about experimental research and the project approach by biotechnologies	<p>Biotechnology challenges</p> <p>Know how to:</p> <ul style="list-style-type: none"> <li>● Situate the major evolutions of biotechnologies in a historical perspective.</li> <li>● Illustrate, with an example, an application of biotechnologies in each domain.</li> <li>● Ask questions about the aspects of application ethics biotechnology on living beings and the environment.</li> <li>● Implement a project in the biotechnology laboratory               <ul style="list-style-type: none"> <li>○ Collaborate within the band.</li> <li>○ Formulate a questioning technological or scientist from a need.</li> <li>○ Propose an experience</li> <li>○ Implement an experimental procedure.</li> <li>○ Exploit the results.</li> <li>○ Report by written or oral work.</li> </ul> </li> </ul>	✓	✓
B: Preventing risks in the biotechnology laboratory	<p>Glossary associated with risk prevention</p> <ul style="list-style-type: none"> <li>● Identify a hazard               <ul style="list-style-type: none"> <li>○ Biological</li> <li>○ Chemical</li> <li>○ electric</li> </ul> </li> <li>● Connect the dangers and risks incurred in the laboratory.               <ul style="list-style-type: none"> <li>○ Identify the different relative routes of exposure to a danger related to the transmission channel.</li> </ul> </li> <li>● Risk analysis approach</li> </ul>	✓	✓



	<ul style="list-style-type: none"> <li>○ Distinguish the risk for the manipulator, the environment and the product.</li> <li>○ Identify within a work situation an exposing position.</li> <li>○ Release within an exposing situation, the more likely dangerous events.</li> <li>○ Make the link between risk, the probability of occurrence of damage and its severity.</li> <li>○ Connect the preventative measures proposed and the analysis of risks.</li> </ul> <p>Implementation of preventive measures in connection with work situations</p> <ul style="list-style-type: none"> <li>● Implement a gesture adapted to analyzed risks.</li> <li>● Apply a procedure of bench disinfection.</li> <li>● Apply a procedure of hand washing.</li> <li>● Choose the container suitable for waste.</li> </ul>		
<p>C: Obtain reliable measurement results</p>	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Lexicon of initiation to metrology and writing conventions <ul style="list-style-type: none"> <li>○ Use the symbols of the magnitudes.</li> <li>○ Link a quantity derivative and the magnitudes of associated basis.</li> <li>○ Respect the conventions of writing quantities in associating the clues adapted and the units.</li> </ul> </li> </ul> <p>Characteristics of measuring instruments and equipment</p> <ul style="list-style-type: none"> <li>● Choose an instrument by taking into account his meteorological features.</li> <li>● Use a measurement device with a technical sheet.</li> </ul> <p>Main characteristics of a measurement</p> <ul style="list-style-type: none"> <li>● Identify the stages of measurement in a procedure.</li> <li>● Identify critical points of an operating procedure.</li> <li>● Qualify the measurements characteristics of a procedure.</li> </ul>		


	<ul style="list-style-type: none"> <li>● Calibration using a standard solution <ul style="list-style-type: none"> <li>○ Use the relationship with a standard calibration to determine the value measured. <ul style="list-style-type: none"> <li>■ single</li> <li>■ curve</li> </ul> </li> </ul> </li> </ul> <p>Use the measurement model to express the measurement result</p> <ul style="list-style-type: none"> <li>● Establish the equation for sizes from the model's measurements.</li> <li>● Establish the equation in units according to the equation magnitudes.</li> <li>● Establish the equation with the digital values.</li> <li>● Validate a calculation made.</li> <li>● Use scientific writing rules.</li> <li>● Express the measurement result using the given uncertainty.</li> <li>● Verify the acceptability of the measured values</li> <li>● Use a metrology document to verify measuring accuracy with a standard check.</li> <li>● Use a metrology document to determine if the measured values are acceptable.</li> <li>● Search for the origin of any inaccuracies.</li> </ul>		
<p>D: Use digital tools in biotechnology</p>	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Use software 3D visualization of molecules of biological interest.</li> <li>● Consult database data.</li> <li>● Sort resources.</li> <li>● Develop a bibliography</li> <li>● Develop a sitography.</li> <li>● Exploit the results experimental with a spreadsheet or dedicated software</li> <li>● Share documents on-line.</li> <li>● Realize a support of oral presentation.</li> <li>● Produce a written document structured to report each step.</li> </ul>		



<p>Acquire the technological and scientific fundamentals of biotechnologies</p> <p>1: Observing the diversity of living things on a microscopic scale</p>	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Produce a fresh report from a suspension bacteria in a liquid medium.</li> <li>● Implement the Gram stain.</li> <li>● Master the process of using an optical microscope.</li> <li>● Estimate the size of an element microscopic.</li> <li>● Draw a microscopic observation for a structure outline.</li> <li>● Complete a drawing or a diagram with a title, scale, annotations.</li> <li>● Differentiate a snapshot of an optical microscopy and an electronic microscopy.</li> <li>● Identify the elements' characteristics of observed cells.</li> <li>● Distinguish types of cells <ul style="list-style-type: none"> <li>○ Bacteria</li> <li>○ Microalgae</li> <li>○ yeast.</li> </ul> </li> </ul>		
<p>2: Cultivate microorganisms</p>	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Work in an aseptic environment in the microbiology laboratory</li> <li>● Apply the methods of sterilizing material to protect the sample.</li> <li>● Organize the post of work.</li> <li>● Handle asepsis conditions with sterile environments.</li> <li>● Identify measures helping to protect the manipulator or the environment from contamination by a culture.</li> </ul> <p>Nutritional conditions and culture media</p> <ul style="list-style-type: none"> <li>● Make the link between two trophic microorganisms types and their nutritional needs.</li> <li>● Choose a culture medium adapted to nutritional needs of a microorganism</li> <li>● Take into account the physicochemical parameters of culture in function of microorganisms.</li> </ul>		

	<ul style="list-style-type: none"> <li>● Choose a guidance medium by acidification with an isolated view of a microorganism of interest.</li> <li>● Choose a selective medium in order to isolate a microorganism of interest.</li> <li>● Prepare a cultivation medium and conditioning by following a procedure.</li> <li>● Identify a scale of sterilization and a manometer on an autoclave.</li> <li>● Seed a medium of liquid culture.</li> <li>● Seed a medium of solid culture.</li> <li>● Set temperature and incubation period.</li> <li>● Identify an environment of culture to guarantee its traceability.</li> <li>● Describe a bacteria colony using macroscopic characteristics.</li> <li>● Observe an isolation to spot a contaminant.</li> </ul>		
<p>3: Characterize to identify microorganisms</p>	<p>Know how to:</p> <p>Complete Nomenclature and classification</p> <ul style="list-style-type: none"> <li>● Use the rules of writing the nomenclature of bacteria for the following taxa: <ul style="list-style-type: none"> <li>○ families</li> <li>○ genera</li> <li>○ species</li> </ul> </li> </ul> <p>Exploitation of the morphological characters of micro-organisms for their Identification</p> <ul style="list-style-type: none"> <li>● Determine the shape, size and mode of bacteria grouping for their identification.</li> <li>● Distinguish between yeasts bacteria by their morphology: <ul style="list-style-type: none"> <li>○ Shape</li> <li>○ size</li> <li>○ presence of bud.</li> </ul> </li> </ul>		

<p>4: Perform a count of microorganisms present in a organic product</p>	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Carry out a count by direct counting under a microscope</li> <li>● Perform a direct count under a microscope in a cytometer manual (hemocytometer).</li> <li>● Perform a count of a culture in a solid medium</li> <li>● Prepare a suspension from a product or sample.</li> <li>● Determine by calculation the dilutions to be made.</li> <li>● Perform decimal dilutions to sow.</li> <li>● Exploit a result of enumeration after cultivation in a solid medium.</li> <li>● Inoculate an exact volume of the prepared sample.</li> <li>● Interpret the result of an enumeration in context.</li> <li>● Implement methods of enumeration in the middle solid and by direct counting.</li> </ul>		
<p>5: Prepare solutions that can be used in the laboratory</p>	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Identify solution preparation, input quantities and the output magnitude in a procedure.</li> <li>● Design a procedure for the preparation of a solution by weighing, by dilution.</li> <li>● Choose the precision material suitable for the preparation of a solution.</li> <li>● Carry out weighing and volume measurement with a controlled gesture.</li> <li>● Implement a preparation procedure solution.</li> </ul>		
<p>6: Detect and characterize biomolecules</p>	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Detect a biomolecule by a chemical reagent</li> <li>● Identify the chemical reagent in a procedure.</li> <li>● Analyze a qualitative result.</li> <li>● Propose a procedure detection operation.</li> </ul>		


	<p>Characterize a biomolecule chromophore by its absorption spectrum</p> <ul style="list-style-type: none"> <li>● Choose the type of tank suitable for the operative procedure.</li> <li>● Make a spectrum absorption.</li> <li>● Determine the optimum wavelength.</li> </ul> <p>Detection of an enzyme by its biological activity</p> <ul style="list-style-type: none"> <li>● Identify the enzyme specific(s) substrate(s) wanted.</li> <li>● Implement detection of the enzyme at pH and set temperature.</li> <li>● Analyze a qualitative result.</li> </ul>		
7: Separating the components of a mixture	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Separate biomolecules by thin layer chromatography</li> <li>● Associate biochemical molecules' properties to separate with the nature of phases used.</li> <li>● Carry out the procedure of thin-layer chromatography taking into account critical points.</li> <li>● Criticize the quality of the chromatogram obtained.</li> <li>● Identify biomolecules separated by comparison to stallions.</li> </ul> <p>Separation of biomolecules by ion exchange chromatography with the aim of purifying them</p> <ul style="list-style-type: none"> <li>● Explain the establishment of ionic bonds between molecules to be separated and the constituents of the phases.</li> <li>● Carry out the procedure of column chromatography, taking into account the points reviews.</li> <li>● Critique the quality of the separation</li> </ul>		
8: Determine the concentration of a molecule in an organic product	<p>Know how to:</p> <ul style="list-style-type: none"> <li>● Dosage of a biomolecule by spectrophotometer</li> <li>● Analyze a procedure to determine the media reactions' composition.</li> <li>● Establish the manipulation table of an assay with a calibration range.</li> <li>● Implement the dosing procedure, respecting the operating conditions.</li> </ul>		

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|  | <ul style="list-style-type: none"><li>● Establish the proportionality relationship between the absorbance of a chromophore and its concentration.</li><li>● Analyze a procedure to qualify the enzymatic or chemical nature of a dose.</li></ul> |  |  |
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Dosage of a biomolecule by volumetry

- Analyze a procedure to identify the solution to dose and the standard solution in connection with the equation of the chemical reaction of dosage.
- Make a diagram of conventional dosage.
- Determine the equivalent volume to using a colored indicator.



Business Management - tech path, specialist courses, High School		Environment and Modern Agriculture	Healthful Eating
Theme 1: Meeting the management of organizations	<p>The student must be able:</p> <ul style="list-style-type: none"> <li>● to articulate individual action and collective action;</li> <li>● to identify the criteria and the specificities making it possible to distinguish the main categories of organizations;</li> <li>● to characterize a given organization;</li> <li>● to identify decisions relating to strategic management and those relating to operational management;</li> <li>● to show how managerial decisions constitute responses to               <ul style="list-style-type: none"> <li>○ strategic orientations</li> <li>○ changes in environment</li> <li>○ desires for growth and external developments.</li> </ul> </li> </ul> <p>Collective action</p> <ul style="list-style-type: none"> <li>● Objectives</li> <li>● Interests               <ul style="list-style-type: none"> <li>○ individual</li> <li>○ collective</li> </ul> </li> </ul> <p>Organized group</p> <ul style="list-style-type: none"> <li>● Organization</li> <li>● Legal framework.</li> <li>● Resources:               <ul style="list-style-type: none"> <li>○ human</li> <li>○ Financial</li> <li>○ tangible</li> <li>○ Intangible</li> <li>○ technologies.</li> </ul> </li> </ul>		

## 1.2 Apprehend the diversity of organizations

- Purposes
  - Goals
  - Individual interests / collectives.
- Goods and services:
  - merchants
  - no merchants.
- Private sector vs Public sector vs Public-private partnerships.
  - Private funding
  - Funding audience.
- Activity area.
- Private companies.
- Organizations and public companies
  - state participation in companies in competitive markets.
- Civil society organizations:
  - associations
  - NGOs
  - unions
  - foundations

## 1.3. Determine / Understand the management of organizations

- Management definition.
  - private management
  - public management.
- Management functions.
  - Strategic management
  - Operational management.
- Strategic Decisions
  - operational decisions
- Evaluation of the effectiveness of management.

	<p>1.4. Determine how the management answers questions concerning changes to the environment</p> <ul style="list-style-type: none"> <li>● Consider the organization as a complex system. <ul style="list-style-type: none"> <li>○ stakeholders</li> <li>○ managerial regulation</li> <li>○ digital transformations</li> <li>○ ecological changes</li> <li>○ social responsibility of companies (CSR).</li> </ul> </li> </ul>		
Theme 2: Strategic management, from diagnosis to setting objectives	<p>The student must be able to distinguish and analyze the main stages of managerial leadership:</p> <ul style="list-style-type: none"> <li>● Define the notion of strategy;</li> <li>● Identify the stages of the strategic approach;</li> <li>● Identify internal and external diagnostic elements;</li> <li>● Identify key success factors from the analysis of environmental factors (macro and micro);</li> <li>● Identify the distinctive skills from <ul style="list-style-type: none"> <li>○ the analysis of the skills and resources of the organization</li> <li>○ the good industry practices;</li> </ul> </li> <li>● Determine objectives and strategic decisions;</li> <li>● Identify nodes of conflict and points of consensus;</li> <li>● Question the results indicators;</li> <li>● Evaluate the organization's performance using these indicators and propose corrective measures.</li> </ul>	✓	
Theme 3: The strategic choices of organizations	<p>The student must be able to analyze and compare the nature of the strategic choices made in the three types of organizations, with regard to their purposes and their specific constraints.</p> <ul style="list-style-type: none"> <li>● Identify the types of purposes of these organizations;</li> <li>● Identify the different levels at which strategic choices are made;</li> </ul>	✓	



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|  | <ul style="list-style-type: none"><li>● Identify and analyze strategic choices;</li><li>● Characterize the competitive advantage of an organization;</li><li>● Assess the degree of transparency of objectives in the three contexts.</li></ul> |  |  |
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