





Ireland Curriculum Strands Alignment (A-C)



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

Biology, Senior Cycle (Ages 15-18)		Environment and Modern Agriculture	Healthful Eating
<p>Strand 1: The study of life</p> <p>1.1: The Scientific Method</p> <p>1.2: The Characteristics of Life</p> <p>1.3: Nutrition</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> • Develop as much as possible in all activities throughout the syllabus. • Identify common features and behaviours of living organisms. Define the terms "metabolism" and "continuity of life". • Define and identify the "characteristics of life" through the fundamental principles and interactions of organisation, nutrition, excretion, response, and reproduction. • Explain in simple terms, the need for food. Identify the elements present in food: six common elements, (C, H, N, O, P, S), five elements present in dissolved salts (Na, Mg, Cl, K, Ca) and three trace elements (Fe, Cu, Zn). • Combine elements in different ratios to form simple biomolecular units, e.g. carbohydrates $C_x(H_2O)_y$. Carbohydrate, fat and oil (lipid), protein and vitamin: their basic element components, biomolecular components and sources. Vitamins: one water-soluble and one fat-soluble vitamin. Define "anabolic" and "catabolic" reaction pathways. Photosynthesis as an example of an anabolic reaction 		

1.4: General Principles of Ecology

sequence. Respiration as an example of a catabolic reaction sequence. Carbohydrate – e.g. cellulose as a component of cell walls. Protein – e.g. fibrous proteins – as keratin in hair and skin, myosin in muscles. Lipid, e.g. component of cell membranes.

- any two minerals present in dissolved salts or in trace amounts in:
 - Plants
 - Animals.
- Understand the importance of water for organisms.
- Define ecology
- Define ecosystems and their diversity
- Explain biosphere
- Define habitat
- Define and give examples of the following as applied to terrestrial and aquatic environments: • abiotic factors • biotic factors • climatic factors.
- Define and give examples of edaphic factors as applied to terrestrial environments.
- Explain, construct and use the sun as the primary source of energy for our planet. Feeding as a pathway of energy flow. Development of grazing food chain, food web and pyramid of numbers. Explain the term “niche”. Define nutrient recycling by organisms.
- Outline the Carbon Cycle and the Nitrogen Cycle.
- Define “Pollution” – areas of effect, its control.
- Study the effects of any one pollutant. Define “conservation”.
- Explain “Waste management” – problems associated with waste disposal. Importance of waste minimisation.
- Definition and one example of the following control factors:

<p>1.5: A Study of an Ecosystem</p>	<ul style="list-style-type: none"> ● competition ● predation ● parasitism ● Symbiosis. ● Outline of the contributory factors or variables in predator and prey relationships. <ul style="list-style-type: none"> ● Record & analyse a general overview of the diversity of life forms in an ecosystem. ● Identify a number of habitats from the selected ecosystem. ● Identify & apply a collection apparatus available for an ecological study. ● Understand the difference between qualitative and quantitative surveys of a selected ecosystem for plants and animals. ● Identify any five fauna and any five flora using simple keys. Identify a variety of habitats within the selected ecosystem. Identify and use various apparatus required for collection methods in an ecological study. Conduct a quantitative study of plants and animals of a sample area of the selected ecosystem. Transfer results to tables, diagrams, graphs, histograms, or any other relevant mode. Identify possible sources of error in such a study. ● Identify the role of the organism in energy transfer. Identify local ecological issues related to the selected ecosystem. 		
<p>Strand 2: The cell 2.1: Cell Structure</p>	<p>Students will be able to:</p> <ul style="list-style-type: none"> ● Be familiar with and use the light microscope. Prepare and examine one animal cell and one plant cell (e.g. own cheek cells, onion cells, Elodea leaf, potato tissue and moss) unstained and stained using the light microscope (x100, x400). 		

2.2: Cell Metabolism

- Indicate the position and function of the cell membrane. Identify and function of the cell membrane, mitochondrion, chloroplast, nucleus, nuclear pores, ribosome, and DNA.
- Define metabolism, solar energy and cellular energy.
- Define “enzymes”–reference to their protein nature, folded shape, and roles in plants and animals. Special reference to their role in metabolism.
- Explain the effect of pH and temperature on enzyme activity.
- Define photosynthesis. Representation by a balanced equation of the overall sequence of reactions.
- Prepare one enzyme immobilisation and examine its application.
- Identify the source of light, carbon dioxide and water for photosynthesis in leaf cells.
- Define the role of "photosynthesis". Representation by a balanced equation of the overall sequence of reactions.
- Locate chlorophyll within cells.
- Define the role of "aerobic respiration". Representation by a balanced equation of the overall sequence of reactions for glucose.
- Define "anaerobic respiration". Reference to fermentation.
- Prepare and show the production of alcohol by yeast.
- Define the terms "diffusion" and "osmosis". Examples of each.
- Prepare and show the production of alcohol by yeast. Conduct any activity to demonstrate osmosis. Describe the application of high salt or sugar concentration in food preservation. Explain the term "optimum activity" under specific conditions as applied to pH range.
- Explain the terms “cell continuity” and “chromosome”.
- Define "haploid" and "diploid" number.
- Describe cell activities in the state of non-division (interphase) and division (mitosis)
- Define cancer and two possible causes.

2.3: Cell Continuity



2.4: Cell Diversity

2.5: Genetics

- Define "mitosis". Simple treatment, with the aid of diagrams.
- Define "meiosis".
 - Define a "tissue". Exemplify by using four tissue types, two each from a plant and an animal.
 - Define an "organ". Exemplify by using two kinds of organs, one each from a plant and an animal.
 - Define an "organ system". Exemplify by using any two animal organ systems.
 - Define "species".
 - Define & give examples of "heredity" and "gene expression".
 - Give the definition and role of a "gene".
 - Isolate DNA from a plant tissue
 - Define a "gamete" and its function in sexual reproduction in plants and animals.
 - Define the following terms:
 - Fertilisation
 - Allele
 - homozygous and heterozygous
 - Genotype
 - Phenotype
 - Dominance
 - Recessive
 - incomplete dominance.
 - Define "evolution". Theory of Natural Selection. Evidence from any one source.
 - State and explain the Law of Segregation. State and explain the Law of Independent Assortment.
 - Define linkage. Explanation of change in 1:1:1:1 probability for a dihybrid heterozygote crossed with a dihybrid recessive organism.
 - Locate protein synthesis, process of protein synthesis – reference only

	to molecular involvement of DNA, mRNA, tRNA, rRNA and amino acids to provide an understanding of their role in coding information.		
<p>Strand 3: The organism</p> <p>3.1: Diversity of Organisms</p> <p>3.2: Organisation and the Vascular Structures</p>	<ul style="list-style-type: none"> ● Classify Monera (Prokaryotae), Protista (Protoctista), Fungi, plant, and animal. ● Distribute bacteria and fungi in nature. ● Understand the term "pathogenic". ● Define and explain the role of "antibiotics". ● Understand the economic importance of bacteria: examples of any two beneficial and any two harmful bacteria. ● Understand the potential abuse of antibiotics in medicine. ● Understand the economic importance of fungi: examples of any two beneficial and any two harmful fungi. ● Explain the term "meristem" – location in the root and shoot. Location of three tissue types – dermal, ground and vascular in transverse and in longitudinal sections of the root and stem. Xylem and phloem as examples of vascular tissues – their function and structure. ● Identify dicotyledons and monocotyledons under the headings: woody/herbaceous, arrangement of floral parts, arrangement of vascular bundles, cotyledon or seed leaf number. ● Describe the structures and organisation of tissues in the closed circulatory system in humans, strong muscular heart and vessels (arteries, veins, capillaries, venules, arterioles). ● Describe the Role of muscle tissues and valves. Two-circuit circulatory system. ● Have a simple understanding of: <ul style="list-style-type: none"> ○ heartbeat and its control ○ Pulse ○ blood pressure. 	✓	✓

3.3: Transport and Nutrition

- The lymphatic system:
 - structure: lymph nodes, lymph vessels
 - any three functions.
- Obtain the knowledge of the effect of smoking, diet and exercise on the circulatory system.
- Have an awareness of specialised heart muscle tissue and the existence and location of pacemaker nodes (SA and AV).
- Describe the uptake and process of transport of the following through the plant:
 - water: to include reference to root hairs, root cortex, xylem, osmosis, diffusion, root pressure, transpiration, and stomata
 - minerals: to include solubility in water, transport from the roots to all parts of the plant by the same route as water
 - carbon dioxide: directly from respiring cells or through stomata
 - photosynthetic products: production of carbohydrate and transport through phloem sieve tube cells.
- Give One example of a root, stem and leaf modification as a food storage organ.
- Define Heterotrophic organisms – “omnivore” (human), “herbivore” and “carnivore”.
- Explain the term “digestion”. Outline the need for digestion and a digestive system.
- Explain the terms “ingestion”, “digestion”, “absorption” and “egestion” as related to the sequence in the human digestive tract.
- Explain the mechanical breakdown and transport of food, to include the role of teeth, peristalsis, and the stomach.
- Explain the chemical breakdown of food, to include:

3.4: Breathing System and Excretion

- bile salts
 - the role, production site, pH at a named location of action and products of an amylase, a protease and a lipase enzyme.
- Explain two functions of symbiotic bacteria in the digestive tract.
- Explain the benefits of fibre.
- Explain the basic structure of the small intestine and large intestine in relation to their functions.
- Describe the composition of blood fluid as a transport system of nutrients, the absorption of nutrients from the villi, transport through the hepatic portal vein to the liver. The function of the liver (without biochemical pathways). The transport of nutrients to all nutrients requiring cells of the body, and the transport of waste products to the kidney.
- Explain the concept of a balanced diet, variety, and moderation. Relate its importance to age, sex and activity (detailed breakdown not required), and to variety from a selection of food groups – milk and milk products; meat, fish and poultry; breads and cereals; fruit and vegetables; others, e.g. fats, oils, alcohol.

- Define homeostasis and the necessity for homeostasis in living organisms.
- Describe the mechanism of the breathing system in the exchange of gasses in humans.

- Explain the role of leaves as excretory organs of plants, the role of the excretory system in homeostasis, and function, location and excretory products of the lungs, skin, and urinary system. Explain the basic function of the urinary excretory system in humans (kidney, ureters, urinary bladder, and urethra) & the role of the kidney in regulating body fluids.

3.5: Responses to Stimuli

- Identify the site of filtration, reabsorption in the cortex, in the medulla and renal pelvis.
- Describe the pathway of urine from the kidney to the urethra.
- Explain the chemical or hormonal system, nerve and sense organ system, muscular, skeletal and an immune system.
- Tropisms: will define the following:
 - "phototropism", "geotropism", "thigmotropism", "hydrotropism", and "Chemotropism".
- Give examples of phototropism and geotropism.
- Regulatory system: will define a "growth regulator", transport through the vascular system, combined effect, growth promoter and growth inhibitor.
- Name four methods of anatomical or chemical adaptation that protects plants.
- Explain the nervous system: two-part division into the central nervous system (CNS) and the peripheral nervous system (PNS). Neuron: its structure and function, with reference only to cell body, dendrites, axon, myelin sheath, Schwann cell, and neurotransmitter vesicles. Movement of nerve impulse. (Detailed knowledge of electro-chemistry not required). Synapse. Activation and inactivation of neurotransmitter. Role and position of three types of neuron: sensory, motor and interneuron. The senses, with the brain as an interpreting centre. Knowledge of the senses. Study of the eye and the ear. Corrective measures for long and short sight or for hearing.
- Explain the central nervous system: brain and spinal cord. Location and function of the following parts of the brain: cerebrum,

hypothalamus, pituitary gland, cerebellum, and medulla oblongata. Cross-section of spinal cord indicating: white matter, gray matter and central canal (refer to their constituent bodies), three-layer protective tissue – the meninges. Dorsal and ventral roots of the spinal nerve. Peripheral nervous system: location of nerve fibres and cell bodies.

- Define Endocrine system: a "hormone". Comparison with nerve action, distinction between exocrine and endocrine glands, with examples. Location of the principal endocrine glands in the human. For each of the glands, name one hormone and give its functions. For one hormone give a description of its deficiency symptoms, excess symptoms, and corrective measures.
- Musculoskeletal system: describe the structure and functions of the skeleton. Component parts of the axial skeleton: skull, vertebrae, ribs, and sternum. Position and function of discs in relation to vertebrae. Component parts of the appendicular skeleton: pectoral and pelvic girdles and their attached limbs.
- Explain the macroscopic anatomy of a long bone: medullary cavity, compact bone, spongy bone, and cartilage. Function of the following: cartilage, compact bone, spongy bone (include red and yellow marrows).
- Classify, locate and explain the function of joints: immovable, slightly movable, free-moving or synovial.
- Explain the role of cartilage and ligaments in joints, the role of tendons, general relation of muscles to the skeleton – antagonistic muscle pairs as exemplified by one human pair, the defence system in

<p>3.6: Reproduction and Growth</p>	<p>humans: general defence system to include the skin and mucous membrane lining of the breathing, reproductive and digestive tracts, the phagocytic white blood cells and the specific defence system (immune system): antigen antibody response.</p> <ul style="list-style-type: none"> ● Define induced immunity ● Viruses: identify the problem of definition. Variety of shapes. Basic structure. Viral reproduction. ● Explain the mechanism of plant response to any one external stimulus ● Describe the feedback mechanism of any one animal hormonal system, the role of lymphocytes: B and T cell types, the role of B cells in antibody production, the role of T cells as helpers, killers, suppressors, and memory T cells, the osteoblast role in bone growth, the terminating development of adult height, the role of osteoblasts in bone cell replacement, bone renewal, and the role of calcium in bone. <p>The flowering Plant:</p> <ul style="list-style-type: none"> ● Describe the structure and function of the floral parts: sepal, petal, stamen, and carpel. ● Define the methods of “pollination”: self-pollination and cross-pollination, to include wind and animal. <p>Define “fertilisation”:</p> <ul style="list-style-type: none"> ○ fertilisation of an egg to form a diploid zygote, which develops into an embryo ○ second fertilisation with polar nuclei results in the formation of the endosperm. 		
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- Explain the Seed structure and function of the following parts: Testa, plumule, radicle, embryo and cotyledon attachments. Embryo and a food supply as contained either in an endosperm or in seed leaves (the cotyledons). Monocotyledon, dicotyledon classification and distinguishing features. Reference to non endospermic seed. Fruit and seed dispersal: examples of wind, water, animal and self-dispersal. Emphasise the need for dispersal.
- Define the advantages of “dormancy”.
- “Germination”: define the factors necessary,
- role of digestion and respiration. Stages of
- seedling growth.
- Describe the vegetative propagation: asexual reproduction in plants. One example each from stem, root, leaf, and bud. Comparison of reproduction by seed and by vegetative propagation.
- Reproduction in the human:
- Explain the general structure of the reproductive system – male and female. Functions of the main parts. Role of meiosis in the production of sperm cells and egg (ova).
- Define “secondary sexual characteristics”.
- Explain the role of oestrogen, progesterone, and testosterone. The menstrual cycle: the events and outlined role of oestrogen and progesterone. Copulation. Location of fertilisation. Implantation, placenta formation and function. Birth – outline of process. Milk production and breastfeeding.

Business, Senior Cycle (Ages 15-18)		Environment and Modern Agriculture	Healthful Eating
Strand 1: People in business	<p>On completion, the student should be able to:</p> <p>1.3.1 list the main parties and people involved in business;</p> <p>1.3.2 describe the relationships between people as workers, as trade union members, as managers, as entrepreneurs, as investors, and as customers;</p> <p>1.3.3 outline non-legislative ways of resolving conflict;</p> <p>1.3.4 outline how a major piece of legislation and the elements of contract law help deal with conflict;</p> <p>1.3.5 analyse the relationships between people in business (HL);</p> <p>1.3.6 illustrate how legislation affects these business relationships (HL);</p> <p>1.3.7 describe a possible business conflict and show how the law would be used to solve it (ILL).</p>	✓	✓
Strand 2: Enterprise	<p>On completion, the student should be able to:</p> <p>2.3.1 define enterprise;</p> <p>2.3.2 identify the importance of enterprise skills in areas such as home, school,</p>	✓	✓



	<p>local community, Government departments, and business start-up;</p> <p>2.3.3 explain the basic enterprise skills;</p> <p>2.3.4 identify the characteristics of enterprising people;</p> <p>2.3.5 analyse the importance of enterprise in business and the community (HL);</p> <p>2.3.6 identify enterprise skills, opportunities, risks and rewards from given data (HL).</p>		
<p>Strand 3: Managing 1</p>	<p>On completion, the student should be able to:</p> <p>3.4.1 define management;</p> <p>3.4.2 identify the importance of management skills in areas such as home, school, local community, Government departments and business start-up;</p> <p>3.4.3 list the characteristics of managers;</p> <p>3.4.4 explain the basic management skills;</p> <p>3.4.5 explain the central role of communications in business and management;</p> <p>3.4.6 identify and explain the main barriers to effective communications;</p> <p>3.4.7 demonstrate business data in the following written forms: memos, reports, and business letters; draft a visual presentation from given, data;</p> <p>3.4.8 identify the duties of a chairperson and secretary and draft an agenda and</p>	<p>✓</p>	<p>✓</p>

	<p>minutes of a meeting;</p> <p>3.4.9 distinguish between the methods of communication;</p> <p>3.4.10 discuss the importance of general communication skills (HL); 3.4.11 differentiate between enterprise and management (HL);</p> <p>3.4.12 explain the contribution of both managers and entrepreneurs to business (HL);</p> <p>3.4.13 discuss the nature of management activities and their linkages (HL).</p>		
<p>Strand 4: Managing 2</p>	<p>On completion, the student should be able to:</p> <p>4.5.1 outline the differences between managing a household and managing a business;</p> <p>4.5.2 explain the importance of finance, insurance and tax implications for business;</p> <p>4.5.3 identify activities common to managing a business and a household, including completion of relevant forms;</p> <p>4.5.4 understand the similarities and differences between these activities in a household context and in a business context;</p> <p>4.5.5 calculate and interpret the main profitability and liquidity ratios and debt/equity;</p> <p>4.5.6 explain the key functions of human resource management;</p> <p>4.5.7</p>	<p>✓</p>	<p>✓</p>


	<p>explain the changing role of a manager from controller to facilitator; 4.5.8 understand the importance of employee participation; 4.5.9 understand how technology changes the role of management; 4.5.10 understand the relationship between employers and employees and the role of trade unions; 4.5.11 understand the central role of human resources in management (HL); 4.5.12 identify the strategies for managing change (HL); 4.5.13 discuss the importance of total quality management (HL); 4.5.14 understand the importance of accountancy and business data in the monitoring of the business enterprise (HL).</p>		
Strand 5: Business in action	<p>On completion, the student should be able to:</p> <p>5.5.1 explain the importance of researching business ideas; 5.5.2 identify techniques for developing business ideas and researching them; 5.5.3 contrast the main sources of new product ideas; 5.5.4 identify and explain the elements involved in a new business startup; 5.5.5 explain the stages involved in setting up a new business; 5.5.6</p>	✓	✓

	<p>identify the main elements of a marketing strategy; 5.5.7</p> <p>explain the elements of the marketing mix; 5.5.8</p> <p>list the main sources of finance available for business start-up; 5.5.9</p> <p>identify the elements of production processes; 5.5.10</p> <p>illustrate the central role of the business plan; 5.5.11</p> <p>identify the reasons for and methods of expansion; 5.5.12</p> <p>identify three main sources of finance for expansion; 5.5.13</p> <p>analyse the importance of Irish business expansion in the domestic and foreign markets (HL); 5.5.14</p> <p>compare and contrast equity and loan capital as sources of finance for expansion (HL); 5.5.15</p> <p>evaluate the elements of the marketing mix (HL); 5.5.16</p> <p>apply the main sources of finance available for business start-up</p>		
<p>Strand 6: Domestic environment</p>	<p>On completion, the student should be able to:</p> <p>6.7.1 recognise and illustrate the categories of industries and their contribution to the domestic economy;</p> <p>6.7.2 recognise the types of business organisation;</p> <p>6.7.3</p>		

	<p>compare and contrast the different types of business organisations;</p> <p>6.7.4 explain why businesses change their organisational structure over time;</p> <p>6.7.5 identify the importance of community initiatives in the development of the local economy;</p> <p>6.7.6 explain the impact of the economy on business;</p> <p>6.7.7 explain the impact of business in the development of the economy;</p> <p>6.7.8 identify important environmental issues in business;</p> <p>6.7.9 list the ways in which the Government creates a suitable climate for business.</p> <p>6.7.10 explain the ways which the Government affects the labour force;</p> <p>6.7.11 define ethical business practice;</p> <p>6.7.12 describe the characteristics of an environmentally conscious company (HL);</p> <p>6.7.13 analyse the impact of environmental issues on business (HL);</p> <p>6.7.14 discuss the social responsibilities of business (HL);</p> <p>6.7.15 evaluate the effects on a firm's costs of meeting its ethical, social and environmental responsibilities (HL).</p>		
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<p>Strand 7: International environment</p>	<p>On completion, the student should be able to:</p> <p>7.4.1 identify the effects of the single market on Irish business;</p> <p>7.4.2 outline reasons for the development of transnational companies;</p> <p>7.4.3 explain the role of information technology on international trade;</p> <p>7.4.4 discuss the opportunities and challenges facing Irish business in developed and developing markets;</p> <p>7.4.5 explain the role of global marketing in international business;</p> <p>7.4.6 explain the purpose of the main European Union policies and directives (HL).</p>		
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<h2>Chemistry, Senior Cycle (Ages 15-18)</h2>	<p>Environment and Modern Agriculture</p>	<p>Healthful Eating</p>
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<p>Ordinary level core</p> <ol style="list-style-type: none"> 1. Periodic table & atomic structure 2. Chemical bonding 3. Stoichiometry, formulas & equations 4. Volumetric analysis 5. Fuels & heats of reaction 6. Rates of reaction 	<ol style="list-style-type: none"> 1. Knowledge <ul style="list-style-type: none"> ● Students should have a knowledge of: <ul style="list-style-type: none"> ○ basic chemical terminology, facts, principles and methods ○ scientific theory ○ social, historical, environmental, technological and economic aspects of chemistry 2. Understanding <ul style="list-style-type: none"> ● Students should understand: <ul style="list-style-type: none"> ○ how chemistry relates to everyday life 		
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- 7. Organic chemistry
- 8. Chemical equilibrium
- 9. Environmental chemistry: water

- scientific information in verbal, graphical and mathematical form
- basic chemical principles
- how chemical problems can be solved
- how the scientific method applies to chemistry.

3. Skills


- Students should be able to:
 - follow instructions given in a suitable form
 - perform experiments safely and co-operatively
 - select and manipulate suitable apparatus to perform specified tasks
 - make accurate observations and measurements
 - interpret experimental data and assess the accuracy of experimental results.

4. Competence

- Students should be able to:
 - translate scientific information in verbal, graphical and mathematical form
 - organise chemical ideas and statements
 - report experimental procedures and results in a concise, accurate and comprehensible manner
 - use chemical facts and principles to make qualitative chemical predictions
 - perform simple chemical calculations
 - discuss public issues relating to chemistry

5. Attitudes

- Students should appreciate:

	<ul style="list-style-type: none"> ○ advances in chemistry and their influence on our lives ○ that the understanding of chemistry contributes to the social and economic development of society ○ the range of vocational opportunities that use chemistry, and how chemists work. 		
<p>Higher level core</p> <ol style="list-style-type: none"> 1. Periodic table & atomic structure 2. Chemical bonding 3. Stoichiometry, formulas & equations 4. Volumetric analysis 5. Fuels & heats of reaction 6. Rates of reaction 7. Organic chemistry 8. Chemical equilibrium 9. Environmental chemistry: water 	<ol style="list-style-type: none"> 1. Knowledge <ul style="list-style-type: none"> ● Students should have a knowledge of: <ul style="list-style-type: none"> ○ basic chemical terminology, facts, principles and methods ○ scientific theories and their limitations ○ social, historical, environmental, technological and economic aspects of chemistry. 2. Understanding <ul style="list-style-type: none"> ● Students should understand: <ul style="list-style-type: none"> ○ how chemistry relates to everyday life ○ scientific information in verbal, graphical and mathematical form ○ basic chemical principles ○ how chemical problems can be solved ○ how the scientific method applies to chemistry. 3. Skills <ul style="list-style-type: none"> ● Students should be able to: <ul style="list-style-type: none"> ○ follow instructions given in a suitable form ○ perform experiments safely and co-operatively ○ select and manipulate suitable apparatus to perform specified tasks ○ make accurate observations and measurements ○ interpret experimental data and assess the accuracy of experimental results. 4. Competence 		

	<ul style="list-style-type: none"> ● Students should be able to: <ul style="list-style-type: none"> ○ translate scientific information in verbal, graphical and mathematical form ○ organise chemical ideas and statements and write clearly about chemical concepts and theories ○ report experimental procedures and results in a concise, accurate and comprehensible manner ○ explain both familiar and unfamiliar phenomena by applying known laws and principles ○ use chemical facts and principles to make chemical predictions ○ perform simple chemical calculations ○ identify public issues and misconceptions relating to chemistry and analyse them critically. <p>5. Attitudes</p> <ul style="list-style-type: none"> ● Students should appreciate: <ul style="list-style-type: none"> ○ advances in chemistry and their influence on our lives ○ that the understanding of chemistry contributes to the social and economic development of society ○ the range of vocational opportunities that use chemistry, and how chemists work. 		
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Computer Science, Senior Cycle (Ages 15-18)		Environment and Modern Agriculture	Healthful Eating
Strand 1: Practices and principles 1. Computational thinking	1.1 describe a systematic process for solving problems and making decisions 1.2 explain how the power of computing enables different solutions to difficult	✓	✓

<p>2. Problem solving</p> <p>3. Logical thinking</p> <p>4. Algorithmic thinking</p> <p>5. Social and ethical considerations of computing technologies</p> <p>6. Turing machines: The Internet; Machine learning; Artificial intelligence</p>	<p>problems</p> <p>1.3 solve problems by deconstructing them into smaller units using a systematic approach in an iterative fashion</p> <p>1.4 solve problems using skills of logic</p> <p>1.5 evaluate alternative solutions to computational problems</p> <p>1.6 explain the operation of a variety of algorithms</p> <p>1.7 develop algorithms to implement chosen solutions</p> <p>1.8 evaluate the costs and benefits of the use of computing technology in automating processes</p> <p>1.9 use modelling and simulation in relevant situations</p> <p>1.10 discuss when heuristics should and could be used and explain the limitations of using heuristics</p> <p>1.11 discuss the complex relationship between computing technologies and society including issues of ethics</p> <p>1.12 compare the positive and negative impacts of computing on culture and society</p>		
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<p>7. User-centered design</p>	<p>1.13 identify important computing developments that have taken place in the last 100 years and consider emerging trends that could shape future computing technologies</p> <p>1.14 explain when and what machine learning and AI algorithms might be used in certain contexts</p> <p>1.15 consider the quality of the user experience when interacting with computers and list the principles of universal design, including the role of a user interface and the factors that contribute to its usability</p> <p>1.16 compare two different user interfaces and identify different design decisions that shape the user experience</p>		
<p>8. Design process</p>	<p>1.17 describe the role that adaptive technology can play in the lives of people with special needs</p> <p>1.18 recognise the diverse roles and careers that use computing technologies</p>		
<p>9. Working in a team, assigning roles and responsibilities</p>	<p>1.19 identify features of both staged and iterative design and development processes</p>		
<p>10. Communication and reporting</p>	<p>1.20 collaborate and assign roles and responsibilities within a team to tackle a computing task</p>		
<p>11. Software development and management</p>	<p>1.21 identify alternative perspectives, considering different disciplines,</p>		

	<p>stakeholders and end users</p> <p>1.22 read, write, test, and modify computer programs</p> <p>1.23 reflect and communicate on the design and development process</p>		
<p>Strand 2: Core Concepts</p> <p>1. Abstraction</p> <p>2. Programming concepts</p>	<p>2.1 use abstraction to describe systems and to explain the relationship between wholes and parts</p> <p>2.2 use a range of methods for identifying patterns and abstract common features</p> <p>2.3 implement modular design to develop hardware or software modules that perform a specific function</p> <p>2.4 illustrate examples of abstract models</p> <p>2.5 use pseudo code to outline the functionality of an algorithm</p> <p>2.6 construct algorithms using appropriate sequences, selections/conditionals, loops and operators to solve a range of problems, to fulfill a specific requirement</p> <p>2.7 implement algorithms using a programming language to solve a range of problems</p>	✓	✓

<p>3. Sorting: Simple sort, Insert sort, Bubble sort, Quicksort Search: Linear search, Binary search</p> <p>4. Algorithmic complexity</p> <p>5. CPU: ALU, Registers, Program counter, Memory</p> <p>6. Basic electronics: voltage, current, resistors, capacitors, transistors</p> <p>7. Operating system layers: Hardware, OS, Application, User</p> <p>8. Web infrastructure - Computer Network Protocols: HTTP, TCP, IP, VOIP</p> <p>9. Boolean, integer, real, char, string, date, array</p> <p>10. 8-bit ASCII Non-Roman</p>	<p>2.8 apply basic search and sorting algorithms and describe the limitations and advantages of each algorithm</p> <p>2.9 assemble existing algorithms or create new ones that use functions (including recursive), procedures, and modules</p> <p>2.10 explain the common measures of algorithmic efficiency using any algorithms studied</p> <p>2.11 describe the different components within a computer and the function of those components</p> <p>2.12 describe the different types of logic gates and explain how they can be arranged into larger units to perform more complex tasks</p> <p>2.13 describe the rationale for using the binary number system in digital computing and how to convert between binary, hexadecimal and decimal</p> <p>2.14 describe the difference between digital and analogue input</p> <p>2.15 explain what is meant by the World Wide Web (WWW) and the Internet, including the client server model, hardware components and communication protocols</p>		
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<p>character sets Unicode: UTF-8, Emojis</p> <p>11. Information systems 12. Debugging Testing: Unit test, Function test, System test</p>	<p>2.16 use data types that are common to procedural high-level languages</p> <p>2.17 use ASCII and Unicode character sets to encode/decode a message and consider the importance of having such standards</p> <p>2.18 collect, store and sort both continuous and discrete data</p> <p>2.19 test solutions and decisions to determine their short-term and long-term outcomes</p> <p>2.20 identify and fix/debug warnings and errors in computer code and modify as required</p> <p>2.21 critically reflect on and identify limitations in completed code and suggest possible improvements</p> <p>2.22 explain the different stages in software testing</p>		
<p>Strand 3: Computer science in practice</p> <p>1. Information systems, User centered design, Web design practice</p> <p>2. File systems and relational databases</p> <p>3. Design process</p>	<p>3.1 understand and list user needs/requirements before defining a solution</p> <p>3.2 create a basic relational database to store and retrieve a variety of forms of data types</p> <p>3.3 use appropriate programming languages to develop an interactive website that can display information from a database that meets a set of users' needs</p> <p>3.4</p>		

4. Analytics; Abstraction	develop algorithms that can find the frequency, mean, median and mode of a data set 3.5		
5. Data collection and analysis	structure and transform raw data to prepare it for analysis 3.6		
6. Interpretation of data	represent data to effectively communicate in a graphical form 3.7		
7. Algorithms	use algorithms to analyse and interpret data in a way that informs decision-making 3.8		
8. Modelling/simulation; Abstraction; Algorithms	develop a model that will allow different scenarios to be tested 3.9		
9. Embedded systems	analyse and interpret the outcome of simulations both before and after modifications have been made 3.10		
10. Computing inputs and outputs	explain the benefits of using agent-based modelling and how it can be used to demonstrate emergent behaviours 3.11		
11. Computer systems	use and control digital inputs and outputs within an embedded system 3.12		
12. Design process	measure and store data returned from an analogue input 3.13		
	develop a program that utilises digital and analogue inputs 3.14		
	design automated applications using embedded systems		