

MYP Subject Overview Design – Computer Science Content

Grade 6 Year 1	Grade 7 Year 2	Grade 8 Year 3	Grade 9 Year 4	Grade 10 Year 5
<ol style="list-style-type: none"> 1. Getting Started with Computer Science 2. Coding Skills 3. Inputs, Outputs, Software & Hardware 4. Artificial intelligence & machine learning 5. Operating Systems (OS) 6. Microbit & coding 	<ol style="list-style-type: none"> 1. Getting started with App inventor 2. Events & Conditionals 3. Procedures & Booleans 4. Lists 5. Design Project 	<ol style="list-style-type: none"> 1. Problem Solving & Computing 2. Web Development 3. Images & Animations 4. Building Games 	<ol style="list-style-type: none"> 1. Introduction to Computer Science 2. Digital Components 3. Introduction to Programming: Java 4. System Software 	<ol style="list-style-type: none"> 1. Advanced Excel 2. Computational Thinking & Programming with Python 3. Database Systems 4. Designing Interactive Graphical User Interfaces with Python Tkinter

6 Hours		ATL Skills	Content
Unit Title (1)	Getting Started with Computer Science	<p>Thinking skills:</p> <ul style="list-style-type: none"> - Make connections between subject groups and disciplines - Classifying systems, analyzing functions <p>Social Skills:</p> <ul style="list-style-type: none"> - Delegate and share responsibility for decision-making <p>Self-management skills:</p> <ul style="list-style-type: none"> - Plan short- and long-term assignments; meet deadlines <p>Research skills:</p> <ul style="list-style-type: none"> - Collect and analyse data to identify solutions and make informed decisions - Verifying device functions <p>Communication skills:</p> <ul style="list-style-type: none"> - Collect and analyse data to identify solutions and make informed decisions - Verifying device functions 	<p>Getting Started with Computer Science Students will learn what computer science is and how to work collaboratively through pair programming. These initial activities will also teach students about persistence by developing a growth mindset, examining diversity in computer science.</p> <ul style="list-style-type: none"> • Why CS Matters • What is a Computer Program • Pair Programming • Growth mindset
MYP Objectives	A – Inquiring & Analyzing B – Developing ideas C – Creating the solution D – Evaluating		
Key concept	Systems		
Related concepts	Innovation		
Global context	Scientific & Technical Innovation		
Statement of inquiry	The communication between human & computer using all functionality available in different perspectives, which leads to better understanding of the effect of computers on human & communities		

16 Hours		ATL Skills	Content
Unit Title (2)	Coding Skills	<p>Thinking skills:</p> <ul style="list-style-type: none"> - Combine knowledge, understanding and skills to create products or solutions. - Debugging challenges, predicting outcomes <p>Communication skills:</p> <ul style="list-style-type: none"> - Make inferences and draw conclusions. <p>Social Skills:</p> <ul style="list-style-type: none"> - Encourage others to contribute <p>Self-management skills:</p> <ul style="list-style-type: none"> - Use appropriate strategies for organizing complex information - Plan short- and long-term assignments; meet deadlines <p>Research skills:</p> <ul style="list-style-type: none"> - Make connections between various sources of information 	<p>Coding Skills</p> <ul style="list-style-type: none"> • Functions <ul style="list-style-type: none"> ○ Students will understand how functions can be helpful, use conditionals with functions to harvest crops in Harvester, and use functions with the Artist. • Variables <ul style="list-style-type: none"> ○ Students will get practice with variables in Sprite Lab, use variables to track a value that changes over time, like a counter, explore the creation of repetitive designs using variables in the Artist environment, learn how variables make code easier to write and easier to read. • For loops <ul style="list-style-type: none"> ○ This unit focuses on for loops and using an incrementing variable to solve more complicated puzzles, practice “for” loops with Artist, complete puzzles to create complex designs and unique art.
MYP Objectives	A – Inquiring & Analyzing B – Developing ideas C – Creating the solution D – Evaluating		
Key concept	Development		
Related concepts	Innovation		
Global context	Scientific & Technical Innovation		
Statement of inquiry	Through continuous innovation , blocks-based coding could be efficiently employed for the development of scientific and technical ideas.		

6 Hours		ATL Skills	Content
Unit Title (3)	Inputs, Outputs, Software & Hardware	<p>Thinking skills:</p> <ul style="list-style-type: none"> - Classifying systems, analyzing functions <p>Communication skills:</p> <ul style="list-style-type: none"> - Use and interpret a range of discipline-specific terms and symbols <p>Social Skills:</p> <ul style="list-style-type: none"> - Make fair and equitable decisions <p>Self-management skills:</p> <ul style="list-style-type: none"> - Plan short- and long-term assignments; meet deadlines <p>Research skills:</p> <ul style="list-style-type: none"> - Collect and analyse data to identify solutions and make informed decisions 	<p>Inputs, Outputs, Software & Hardware</p> <ul style="list-style-type: none"> • Definitions of inputs, outputs, software and hardware. • Examples of inputs, outputs, software and hardware. • Images of inputs, outputs, software and hardware.
MYP Objectives	<p>A – Inquiring & Analyzing B – Developing ideas C – Creating the solution D – Evaluating</p>		
Key concept	Communication		
Related concepts	Function Evaluation		
Global context	Orientation in space & time		
Statement of inquiry	Understanding how inputs, outputs, software, and hardware function together helps us communicate with systems and evaluate how technology shapes our interaction with the world over time .		

16 Hours		ATL Skills	Content
Unit Title (4)	Artificial intelligence & machine learning	<p>Thinking skills:</p> <ul style="list-style-type: none"> - Practise observing carefully in order to recognize problems - Interpret data <p>Communication skills:</p> <ul style="list-style-type: none"> - Share ideas with multiple audiences using a variety of digital environments and media <p>Social Skills:</p> <ul style="list-style-type: none"> - Help others to succeed <p>Self-management skills:</p> <ul style="list-style-type: none"> - Keep an organized and logical system of information files/notebooks <p>Research skills:</p> <ul style="list-style-type: none"> - Collect, record and verify data - Make connections between various sources of information 	<p>Artificial intelligence & machine learning</p> <ul style="list-style-type: none"> • Introduction to Machine Learning • Identifying patterns of data • Innovations in AI • Types of machine learning • AI impact on society • Connections between patterns of data • How computers learn
MYP Objectives	<p>A – Inquiring & Analyzing B – Developing ideas C – Creating the solution D – Evaluating</p>		
Key concept	Development		
Related concepts	Invention Perspective		
Global context	Orientation in space & time		
Statement of inquiry	AI could be described as a continuous development and invention in relation to time & place, that utilizes one’s perspective towards daily & real-life challenges.		

4 Hours		ATL Skills	Content
Unit Title (5)	Operating Systems (OS)	<p>Thinking skills:</p> <ul style="list-style-type: none"> - Make connections between subject groups and disciplines <p>Communication skills:</p> <ul style="list-style-type: none"> - Share ideas with multiple audiences using a variety of digital environments and media <p>Self-management skills:</p> <ul style="list-style-type: none"> - Plan short- and long-term assignments; meet deadlines <p>Research skills:</p> <ul style="list-style-type: none"> - Collect and analyse data to identify solutions and make informed decisions 	<p>Operating Systems (OS)</p> <ul style="list-style-type: none"> • Types of operating systems • Images of operating systems • Tasks of OS
MYP Objectives	<p>A – Inquiring & Analyzing B – Developing ideas C – Creating the solution D – Evaluating</p>		
Key concept	System		
Related concepts	Form Function		
Global context	Scientific & Technical Innovation		
Statement of inquiry	Students use different forms of systems to function properly and develop based on technical innovation .		

6 Hours		ATL Skills	Content
Unit Title (6)	Microbit & coding	<p>Thinking skills:</p> <ul style="list-style-type: none"> - Use models and simulations to explore complex systems and issues <p>Communication skills:</p> <ul style="list-style-type: none"> - Share ideas with multiple audiences using a variety of digital environments and media <p>Social Skills:</p> <ul style="list-style-type: none"> - Help others to succeed - Listen actively to other perspectives and ideas <p>Self-management skills:</p> <ul style="list-style-type: none"> - Take responsibility for all outcomes of goal directed action <p>Research skills:</p> <ul style="list-style-type: none"> - Understand and use technology systems 	<p>Microbit & coding</p> <ul style="list-style-type: none"> • Exploring BBC Microbit controller • Microsoft Make code • Connecting Wires • Employing electronics <ul style="list-style-type: none"> - Led's - Buzzers • Coding commands <ul style="list-style-type: none"> - Events - Conditional statements - Variables - loops
MYP Objectives	<p>A – Inquiring & Analyzing</p> <p>B – Developing ideas</p> <p>C – Creating the solution</p> <p>D – Evaluating</p>		
Key concept	Systems		
Related concepts	Function Innovation		
Global context	Scientific & Technical Innovation		
Statement of inquiry	Students employ scientific & technical innovation to achieve the function of the overall system .		

6 Hours		ATL Skills	Content
Unit Title (1)	Getting started with App inventor	<p>Research skills:</p> <ul style="list-style-type: none"> - Explore the App Inventor Gallery to analyze how other creators solved similar problems. <p>Self-management skills:</p> <ul style="list-style-type: none"> - Organize media files and components within the App Inventor environment; manage time during the build phase. <p>Thinking skills:</p> <ul style="list-style-type: none"> - Decompose complex problems into smaller, manageable steps (Algorithms) and debug code logic. <p>Social skills:</p> <ul style="list-style-type: none"> - Collaborate during "Pair Programming" sessions, practicing the roles of Driver and Navigator effectively. 	<p>Getting started with App inventor</p> <ul style="list-style-type: none"> • App Inventor Environment: Designer vs. Blocks • Event-Driven Programming: Inputs and Outputs • Algorithms and Logic • Pair Programming Protocols
MYP Objectives	<p>A – Inquiring & Analyzing B – Developing ideas C – Creating the solution D – Evaluating</p>		
Key concept	System		
Related concepts	Collaboration Function		
Global context	Scientific & Technical Innovation		
Statement of inquiry	<p>Collaborative systems allow us to adapt digital functions to create scientific and technical innovations.</p>		

8 Hours		ATL Skills	Content
Unit Title (2)	Events & Conditionals	<p>Research skills: Locate Media:</p> <ul style="list-style-type: none"> - Planning and searching for audio/images that are free to use (Creative Commons), respecting intellectual property. <p>Self-management skills: Organization:</p> <ul style="list-style-type: none"> - Managing media files and organizing the spatial layout of buttons on the screen. <p>Thinking skills: Debugging:</p> <ul style="list-style-type: none"> - Analysing why a sound won't stop and using logic (Evaluation) to fix the code using conditionals. <p>Social skills: Cooperating:</p> <ul style="list-style-type: none"> - Working in pairs to test each other's apps and respecting others' creative rights. 	<p>Events & Conditionals</p> <ul style="list-style-type: none"> • Conditionals (Logic): If / Then / Else logic. • Media Management & Copyright: • App Inventor Components: Player vs. Sound, Layouts • Debugging Strategies
MYP Objectives	B – Developing ideas C – Creating the solution		
Key concept	Communication		
Related concepts	Innovation Form		
Global context	Scientific & Technical Innovation Systems, models, methods; products, processes & solutions		
Statement of inquiry	Scientific & technical innovations allow us to create new forms of communication through interactive applications controlled by logical decisions.		

12 Hours		ATL Skills	Content
Unit Title (3)	Procedures & Booleans	<p>Thinking skills:</p> <ul style="list-style-type: none"> - acquisition of knowledge, application, analysis. <p>Social skills:</p> <ul style="list-style-type: none"> - accepting responsibility for individual project work. <p>Communication skills:</p> <ul style="list-style-type: none"> - listening to instructions, viewing demos of working games. <p>Self-management skills:</p> <ul style="list-style-type: none"> - spatial awareness on the coordinate grid, organization of code into procedures. <p>Research skills:</p> <ul style="list-style-type: none"> - observing how sprite properties affect movement, planning before coding. 	<p>Procedures & Booleans</p> <p>Mobile games involving animation in App Inventor.</p> <ul style="list-style-type: none"> • Build a Simple Chase Game using image sprites, button control, and random numbers; use the Table Arrangement component for designing the user interface; place and move sprites using their X and Y coordinates. • Build Android Mash that includes timing, animation, and random movement; improve the Android Mash app by adding score, end game, and restart features. • Build Pong App using timing, animation, and random movement; use debugging strategies to fix errors in a Pong game.
MYP Objectives	<p>A – Inquiring & Analyzing</p> <p>B – Developing ideas</p> <p>C – Creating the solution</p> <p>D – Evaluating</p>		
Key concept	Development		
Related concepts	Adaptation Function		
Global context	Orientation in Space & Time		
Statement of inquiry	<p>Mobile game developers use procedures, Booleans, and coordinate systems to adapt sprite behaviour across space & time, building interactive experiences that respond to user input.</p>		

12 Hours		ATL Skills	Content
Unit Title (4)	Lists	<p>Thinking skills:</p> <ul style="list-style-type: none"> - acquisition of knowledge, comprehension, application, analysis, synthesis, evaluation. <p>Social skills:</p> <ul style="list-style-type: none"> - accepting responsibility for individual project work. <p>Communication skills:</p> <ul style="list-style-type: none"> - listening, viewing demos of working apps. <p>Self-management skills:</p> <ul style="list-style-type: none"> - spatial awareness in app UI layout, organization of code and assets. <p>Research skills:</p> <ul style="list-style-type: none"> - observing how lists behave at their boundaries, planning before coding, organizing data into parallel lists. 	<p>Lists</p> <ul style="list-style-type: none"> • Build Magic Ball App that shows an answer after the user shakes the device, with an image of an 8-Ball, a label that gives directions, and a label that shows the answer; create a list with potential answers. • Build Slideshow App that lets the user scroll through pictures; loop the pictures so when the user reaches the last picture, they go back to the beginning; publish the customized app to an electronic portfolio; reflect on the creation process and use of computer-science concepts. • Build Computer Science Innovators Quiz — Navigate through a list using an index variable; select items from a list; check for the end of the list; work with parallel lists; program images, buttons, and lists; use an index variable to use parallel lists; create a procedure to reset the score, images, and labels.
MYP Objectives	<p>A – Inquiring & Analyzing</p> <p>B – Developing ideas</p> <p>C – Creating the solution</p> <p>D – Evaluating</p>		
Key concept	System		
Related concepts	<p>Adaptation</p> <p>Evaluation</p> <p>Resources</p>		
Global context	Scientific & Technical Innovation		
Statement of inquiry	<p>Lists are a system for organizing app resources & using indexes & if/else algorithms lets developers adapt & evaluate how an app moves through stored data.</p>		

16 Hours		ATL Skills	Content
Unit Title (5)	Design Project	<p>Thinking skills:</p> <ul style="list-style-type: none"> - acquisition of knowledge, comprehension, application, analysis, evaluation. <p>Social skills:</p> <ul style="list-style-type: none"> - accepting responsibility for honest collaboration with users and peers. <p>Communication skills:</p> <ul style="list-style-type: none"> - listening to users, writing problem statements, viewing peer work, presenting the final pitch. <p>Self-management skills:</p> <ul style="list-style-type: none"> - spatial awareness in paper prototyping, time management across eight stages, organization of design artifacts. <p>Research skills:</p> <ul style="list-style-type: none"> - observing user behavior, planning interviews, organizing data, formulating questions, collecting data, recording data, interpreting data. 	<p>Design Project</p> <ul style="list-style-type: none"> • Explore Apps That Help Others to solve problems & brainstorm possible topics for a design project. • Empathy and Interviews - Brainstorm topics, pick a topic and a partner, and prepare interview questions to use with real potential users. • Market Research & Problem Statement - Research existing apps and websites related to the chosen idea & write a clear problem statement. • Wild Idea Dash & One Standout Idea - Complete the Wild Idea Dash to generate many ideas quickly, receive peer feedback, and choose one standout idea to develop further. • Paper Prototype & Pitch Presentation - Develop & build a paper prototype of the app & prepare a short pitch presentation. • Plan Algorithms & Build MVP • MVP Feedback & Iterate • Reflect & Prepare Presentation of App
MYP Objectives	<p>A – Inquiring & Analyzing</p> <p>B – Developing ideas</p> <p>C – Creating the solution</p> <p>D – Evaluating</p>		
Key concept	Development		
Related concepts	<p>Collaboration</p> <p>Evaluation</p> <p>Invention</p>		
Global context	Scientific & Technical Innovation		
Statement of inquiry	<p>Design thinking is a development process where invention, collaboration, & ongoing evaluation turn empathy for real users into mobile-app innovations that help people.</p>		

13 Hours		ATL Skills	Content
Unit Title (1)	Problem Solving & Computing	<p>Research skills</p> <ul style="list-style-type: none"> - Formulating questions to understand a problem. - Observing user needs and planning research to gather relevant data for their app proposal. <p>Communication skills</p> <ul style="list-style-type: none"> - Listening to peer feedback and viewing classmates' proposals to refine their own ideas. <p>Self-management skills (Organization skills)</p> <ul style="list-style-type: none"> - Making informed choices about the features and design of their proposed app. - Organizing their ideas into a coherent and well-structured project plan and presentation. <p>Thinking skills (Critical thinking skills):</p> <ul style="list-style-type: none"> - Applying the steps of the problem-solving process to their chosen challenge. - Analyzing and evaluating peer feedback to synthesize improvements for their app design. <p>Social skills (Collaboration):</p> <ul style="list-style-type: none"> - Cooperating in group activities, making group decisions, and accepting responsibility during collaborative problem-solving tasks. 	<p>Problem Solving & Computing</p> <ul style="list-style-type: none"> • Introduction to Problem Solving • The Problem-Solving Process (Define, Prepare, Try, Reflect) • What is a computer? • Information Processing: Input & Output • Information Processing: Processing • Information Processing: Storage • Summative Project: Propose an App
MYP Objectives	A – Inquiring & Analyzing B – Developing ideas C – Creating the solution		
Key concept	System		
Related concepts	Adaptation Innovation Invention		
Global context	Scientific & Technical Innovation		
Statement of inquiry	Innovations in system thinking allow for the adaptation & invention of new solutions within the context of scientific & technical advancement.		

15 Hours		ATL Skills	Content
Unit Title (2)	Web Development	<p>Research skills:</p> <ul style="list-style-type: none"> - Analyze examples of websites and gather content that fits their personal theme <p>Communication skills:</p> <ul style="list-style-type: none"> - Present their ideas visually and textually through the design process <p>Self-management skills:</p> <ul style="list-style-type: none"> - Organize and plan the creation of their web pages, manage tasks and time <p>Thinking skills:</p> <ul style="list-style-type: none"> - Debug code, evaluate the effectiveness of the solution, and improve based on feedback <p>Social skills:</p> <ul style="list-style-type: none"> - Collaborate during peer reviews, participate in group code-check sessions 	<p>Web Development</p> <ul style="list-style-type: none"> • HTML Basics: Tags, Structure, Lists, and Headings • CSS Styling: Text, Layout, and Images • Web Project Planning & Execution • Copyright & Responsible Sharing • Web Lab Platform Usage
MYP Objectives	<p>A – Inquiring & Analyzing B – Developing ideas C – Creating the solution D – Evaluating</p>		
Key concept	Communication		
Related concepts	Form Perspective		
Global context	Personal & Cultural Expression		
Statement of inquiry	The structure & design of web pages empower individuals to communicate ideas creatively, while encouraging responsible information sharing & digital citizenship.		

15 Hours		ATL Skills	Content
Unit Title (3)	Images & Animations	<p>Thinking skills:</p> <ul style="list-style-type: none"> - acquisition of knowledge, application, analysis. <p>Social skills:</p> <ul style="list-style-type: none"> - accepting responsibility for their own project, cooperating during peer feedback. <p>Communication skills:</p> <ul style="list-style-type: none"> - listening to feedback, viewing peer animations, presenting their final project. <p>Self-management skills:</p> <ul style="list-style-type: none"> - spatial awareness on the coordinate grid, organization of code into clear sections. <p>Research skills:</p> <ul style="list-style-type: none"> - observing how sprite properties change behaviour, planning before coding. 	<p>Images & Animations</p> <ul style="list-style-type: none"> • Programming for a Purpose: Create a prototype of an animation or game • Plotting Shapes & Drawing in Game Lab • Shapes and Parameters • Variables & Random Numbers • Sprites and Their Properties • The Draw Loop • Sprite Movement • Conditionals • Keyboard Input & Mouse Input • Project — Interactive Card
MYP Objectives	<p>A – Inquiring & Analyzing</p> <p>B – Developing ideas</p> <p>C – Creating the solution</p> <p>D – Evaluating</p>		
Key concept	Systems		
Related concepts	Innovation Evaluation		
Global context	Scientific & Technical Innovation		
Statement of inquiry	<p>Animation systems combine simple shapes, sprites, loops, & conditionals into innovations that respond to users & let creators evaluate & improve their ideas through scientific & technical experimentation.</p>		

12 Hours		ATL Skills	Content
Unit Title (4)	Building Games	<p>Thinking skills:</p> <ul style="list-style-type: none"> - acquisition of knowledge, application, analysis. <p>Social skills:</p> <ul style="list-style-type: none"> - accepting responsibility for their own project, cooperating during peer feedback. <p>Communication skills:</p> <ul style="list-style-type: none"> - listening to feedback, viewing peer animations, presenting their final project. <p>Self-management skills:</p> <ul style="list-style-type: none"> - spatial awareness on the coordinate grid, organization of code into clear sections. <p>Research skills:</p> <ul style="list-style-type: none"> - observing how sprite properties change behaviour, planning before coding. 	<p>Building Games</p> <ul style="list-style-type: none"> • Velocity: Describe the advantages of simplifying code by using higher-level blocks; • Collision Detection: Describe how abstractions help to manage the complexity of code; • Complex Sprite Movement: Explain how individual programming constructs combine to create more complex behavior; • Collisions: Describe how abstractions can be built upon to develop further abstractions; • Functions: Create and use functions for blocks of code that perform a single high-level task; • The Game Design Process: Implement different features of a program by following a structured project guide. • Using the Game Design Process: Implement different features of a program by following a structured project guide; Project - Design a Game: Create a plan for building a piece of software by describing its major components; implement that plan; independently scope the features of the software.
MYP Objectives	<p>A – Inquiring & Analyzing</p> <p>B – Developing ideas</p> <p>C – Creating the solution</p> <p>D – Evaluating</p>		
Key concept	Systems		
Related concepts	Innovation Evaluation		
Global context	Scientific & Technical Innovation		
Statement of inquiry	<p>Game systems use abstraction, functions, & structured design processes to organize complex behavior into innovations that creators can evaluate, refine, & share.</p>		

9 Hours		ATL Skills	Content
Unit Title (1)	Introduction to Computer Science	<p>Thinking skills – Critical Thinking</p> <ul style="list-style-type: none"> ● Analysis and Decomposition: Breaking down complex problems into smaller, manageable parts (Decomposition) and identifying underlying patterns in data (Pattern Recognition). ● Abstraction and Algorithm Design: Identifying essential elements of a problem while ignoring irrelevant details to design step-by-step solutions. <p>Social skills – Collaboration & Accepting Responsibility</p> <ul style="list-style-type: none"> ● Accepting responsibility: Participating constructively in peer "Code Reviews" and giving/receiving objective feedback on computational artifacts. ● Working in groups: Managing team dynamics when exploring the diverse careers and societal impacts of computing. <p>Communication skills – Informing & Documenting</p> <ul style="list-style-type: none"> ● Listening & Reading: Interpreting introductory technical documentation and actively listening to peers' explanations of their computational thinking processes. ● Expressing ideas: Articulating the differences between Computer Science, IT, and Coding using appropriate terminology. <p>Research skills – Information & Media Literacy</p> <ul style="list-style-type: none"> ● Formulating questions: Asking meaningful, inquiry-based questions about how specific technologies work and observing their multi-faceted impacts on society. ● Media literacy: Investigating the social, economic, and cultural impacts of digital innovations on modern communities. 	<p>Introduction to Computer Science</p> <ul style="list-style-type: none"> ● The Computing Landscape: Differentiating between Computer Science, IT, and Coding. ● The 4 Pillars of Computational Thinking (CT): Foundations of Decomposition, Pattern Recognition, Abstraction, and Algorithm Design. ● Societal Architecture: Exploring the social, economic, and cultural impacts of computer science innovations. ● The Critique Process: Mastering "Code Review" to evaluate, talk about, and improve computational artifacts. ● Future Horizons: Investigating diverse professional opportunities (such as UI/UX, AI, and Robotics).
MYP Objectives	A – Inquiring & Analyzing B – Developing ideas C – Creating the solution D – Evaluating		
Key concept	Communities		
Related concepts	Innovation Form		
Global context	Personal & cultural expression Artistry, craft, creation, beauty		
Statement of inquiry	Computer science innovations allow communities to express themselves culturally & personally through new forms of computational thinking & artifact creation.		

14 Hours		ATL Skills	Content
Unit Title (2)	Digital Components	<p>Thinking Skills (Critical Thinking & Comprehension):</p> <ul style="list-style-type: none"> Analyzing how different hardware components interact within a system to process binary information. <p>Social Skills (Collaboration):</p> <ul style="list-style-type: none"> Accepting responsibility during group investigations of computer hardware assembly and system specifications. <p>Communication Skills (Informing):</p> <ul style="list-style-type: none"> Reading technical hardware specifications and listening to explanations of data flow between CPU, RAM, and Storage. <p>Self-Management Skills (Organization & Informed Choices):</p> <ul style="list-style-type: none"> Making informed choices when selecting hardware components based on system requirements and spatial awareness of device architecture. <p>Research Skills (Information Literacy):</p> <ul style="list-style-type: none"> Observing, identifying, and categorizing various internal and external digital devices and their functions. 	<p>Digital Components</p> <ul style="list-style-type: none"> The Architecture of a System: Definition and role of hardware components in a computer system. Processing and Memory: Understanding the functions and types of CPU, RAM, and ROM. Input, Output, and Storage: Differentiating between peripheral devices and secondary storage types (SSD, HDD). The Binary Language: Introduction to how hardware processes information using binary logic (0s and 1s).
MYP Objectives	<p>A – Inquiring & Analyzing</p> <p>B – Developing ideas</p> <p>C – Creating the solution</p> <p>D – Evaluating</p>		
Key concept	Systems		
Related concepts	Innovation Form		
Global context	<p>Scientific & Technical Innovation</p> <p>Systems, models, methods; products, processes & solutions</p>		
Statement of inquiry	<p>Scientific & technical innovation relies on the specific form of hardware components working together as a system to process information using binary language.</p>		

24 Hours		ATL Skills	Content
Unit Title (3)	Introduction to Programming: Java	<p>Thinking skills – Critical Thinking (Transfer Skills)</p> <ul style="list-style-type: none"> • Transferring skills across disciplines & contexts: Students practice "Logic Transfer" by taking abstract computational logic (like loops, conditions, or algorithms) and mapping them into Java's structural syntax. This allows students to realize that logical problem-solving models remain universal, and the challenge lies in translating these models accurately into a formal programming language. <p>Self-management skills – Affective Skills (Resilience)</p> <ul style="list-style-type: none"> • Practising strategies to overcome distractions and loss of focus: Cultivating persistence and emotional management when debugging Java syntax (such as missing semicolons; or brace errors <code>}</code>). Students practice resilience in resolving "Compiler Errors." Through this, students develop technical resilience, learning to systematically read error logs, maintain focus during rigorous debugging phases, and view compiler errors as constructive feedback. 	<p>Introduction to Programming: Java</p> <ul style="list-style-type: none"> • The Syntax Structure (Output & Main Method) Students explore the foundational structure of a Java program, understanding the purpose of the main method, code blocks, and how the compiler executes output statements. • The Container Concept (Variables & Strong Typing) Students investigate how Java handles memory allocation through a strictly-typed system, mastering data types (Integers, Doubles, Strings, Booleans) and variable declarations. • The Logic Lab (Operators & Math) Students apply mathematical, relational, and logical operators in Java to build expressions, creating the core programmatic logic required for conditional decision-making. • Interaction (Input & System Feedback) Students learn how to integrate user input (using tools like the Scanner class) to build interactive console applications, evaluating how input flows through the digital system.
MYP Objectives	A – Inquiring & Analyzing B – Developing ideas C – Creating the solution D – Evaluating		
Key concept	Systems		
Related concepts	Innovation Function		
Global context	Scientific & Technical Innovation Systems, models, methods; products, processes & solutions		
Statement of inquiry	Scientific and technical innovations rely on precise syntax and structural programming to design systems that function effectively as problem-solving solutions.		

6 Hours		ATL Skills	Content
Unit Title (4)	System Software	<p>Thinking skills – Critical Thinking Analyze how operating systems manage hardware and software interactions, evaluate the role of the OS as a bridge between users, applications, and hardware, and apply understanding of OS concepts to explain system functionality.</p> <p>Social skills – Collaboration Take responsibility for individual research on operating systems, contribute findings effectively in group discussions, and collaborate respectfully during technical investigations and debates.</p> <p>Communication skills – Informing & Literacy Interpret technical information about operating systems, compare different OS architectures, and communicate findings clearly using appropriate technical terminology and structured presentations.</p> <p>Self-management skills – Organization & Reflection Make informed decisions when managing system settings and resources, organize digital work effectively, and reflect on the impact of configuration choices on system performance.</p> <p>Research skills – Information Literacy Investigate and document operating system behaviour, observe patterns in system performance across different environments, and use evidence to explain variations in system operation.</p>	<p>System Software</p> <ul style="list-style-type: none"> • Operating System Fundamentals An introduction to the core architecture of system software, exploring the history, evolution, and varieties of modern operating systems (e.g., Windows, macOS, Linux). • Operating System Functions & Resource Management Analyzing how the OS acts as a resource manager, handling memory allocation, CPU scheduling, file systems, and peripheral communication. • The Boot Process (Starting Your Computer) Deconstructing the technical stages of starting a computer, from the initial BIOS/UEFI firmware checks to loading the OS kernel into memory.
MYP Objectives	<p>A – Inquiring & Analyzing B – Developing ideas C – Creating the solution D – Evaluating</p>		
Key concept	Systems		
Related concepts	<p>Function Resources Markets & Trends</p>		
Global context	Scientific & Technical Innovation		
Statement of inquiry	<p>Operating systems function as the central system that manages a computer's resources, shapes user experience, and reflects market trends in scientific & technical innovation.</p>		

8 Hours		ATL Skills	Content
Unit Title (1)	Advanced Excel	<p>Thinking skills – Critical & Creative Thinking</p> <ul style="list-style-type: none"> - Acquisition of knowledge, Application, Synthesis. - Comparing different chart types to determine which best communicates a message. - Debugging formulas and revising design choices based on feedback. <p>Social skills:</p> <ul style="list-style-type: none"> - Accepting responsibility. <p>Communication skills:</p> <ul style="list-style-type: none"> - Listening, Viewing, Presenting. - Presenting data visualizations and explaining design decisions - Giving and receiving structured peer feedback on clarity and effectiveness <p>Self-management skills:</p> <ul style="list-style-type: none"> - Spatial awareness, Organization, Time management. 	<p>Advanced Excel</p> <ul style="list-style-type: none"> • Data organization as a form of communication. • Cell references & formula logic • Advanced Excel functions for analysing relationships. • Charts as visual communication tools. • Trendlines and patterns in real-world data.
MYP Objectives	<p>A – Inquiring & Analyzing B – Developing ideas C – Creating the solution</p>		
Key concept	Communication		
Related concepts	Adaptation Collaboration Form		
Global context	Personal & cultural expression		
Statement of inquiry	Effective communication relies on the adaptation & collaboration of digital tools & data forms to support personal & cultural expression in a globally interconnected world.		

17 Hours		ATL Skills	Content
Unit Title (2)	Computational Thinking & Programming with Python	<p>Thinking skills – Critical & Creative Thinking</p> <ul style="list-style-type: none"> - Critical Thinking: Analysing problems and system requirements - Creative Thinking: Designing and evaluating algorithms - Transfer Skills: Transferring programming concepts to new contexts <p>Research Skills</p> <ul style="list-style-type: none"> - Information literacy: researching existing digital systems - Media literacy: evaluating automated systems <p>Communication skills:</p> <ul style="list-style-type: none"> - Explaining algorithms and code logic clearly - Using appropriate technical language terminology and documentation <p>Self-management skills:</p> <ul style="list-style-type: none"> - Organization: managing time and development stages, Investigating existing digital systems - Reflection: Evaluating reliability and limitations of automated solutions, Planning development stages, Debugging and revising code through reflection 	<p>Computational Thinking & Programming with Python</p> <ol style="list-style-type: none"> 1. Computational Thinking Concepts: <ul style="list-style-type: none"> • Abstraction • Decomposition • Pattern recognition • Algorithmic design 2. Flowcharts & Algorithm Representation <ul style="list-style-type: none"> • Flowchart symbols • Input process & output • algorithms (pseudocode) & flowcharts 3. Programming Concepts (Python): <ul style="list-style-type: none"> • Variables and Data Types • Selection Structures • Loops and Iteration • Object-Oriented Concepts (Introductory) • Testing and Debugging 4. Interface Design and Project Development
MYP Objectives	<p>A – Inquiring & Analyzing</p> <p>B – Developing ideas</p> <p>C – Creating the solution</p> <p>D – Evaluating</p>		
Key concept	System		
Related concepts	Function Adaptation Evaluation		
Global context	Scientific & Technical Innovation		
Statement of inquiry	Digital systems are built from interconnected functions that can be adapted , tested, & evaluated to create effective solutions to real-world problems.		

18 Hours		ATL Skills	Content
Unit Title (3)	Database Systems	Thinking skills – Application Critical Thinking Research Skills - Formulating questions, Collecting and analyzing information Communication skills: - Using appropriate technical vocabulary Self-management skills: - Organization, Attention to detail Social Skills - Collaboration	Database Systems Fundamental concepts of databases: <ul style="list-style-type: none"> ● Difference between flat file systems and relational database systems. ● Database structure: tables, records, fields. ● Relationships between data and entities. ● Importance of data organization, accuracy, and efficiency in digital systems. Database design (ERD): <ul style="list-style-type: none"> ● Entity Relationship Diagrams (ERD). ● Entities and attributes. ● Relationship types: SQL (Structured Query Language): <ul style="list-style-type: none"> ● SQL categories: ● Basic SQL commands: ● Filtering and sorting: Advanced SQL operations: <ul style="list-style-type: none"> ● JOIN operations (especially INNER JOIN). ● Combining data from multiple tables. ● Understanding relationships through keys in queries. Database development and management: <ul style="list-style-type: none"> ● Creating and modifying database structures. ● Retrieving and manipulating data efficiently. ● Ensuring data integrity and reducing redundancy. ● Applying database design principles to real-world scenarios.
MYP Objectives	A – Inquiring & Analyzing B – Developing ideas C – Creating the solution D – Evaluating		
Key concept	Development		
Related concepts	Systems Function Communication		
Global context	Scientific & Technical Innovation		
Statement of inquiry	Development drives the creation of functional systems that organize, process, & communicate information efficiently through scientific & technical innovation .		

12 Hours		ATL Skills	Content
Unit Title (4)	Designing Interactive Graphical User Interfaces with Python Tkinter	<p>Thinking skills – Transfer Skills Apply Python Tkinter concepts to design and develop functional graphical user interfaces (GUIs), and transfer programming knowledge to create interactive applications that address real-world needs.</p> <p>Thinking skills – Critical thinking Analyze user requirements to select appropriate widgets, layouts, and event-handling techniques, and evaluate design solutions to improve usability, functionality, and user experience.</p> <p>Thinking skills – Creativity Design original and user-friendly GUI applications, and explore innovative ways to enhance interaction and communication between users and digital systems.</p> <p>Research Skills Formulate inquiry questions about GUI design and usability, investigate interface design principles, gather information from technical resources, and analyze different design approaches to identify effective solutions.</p> <p>Communication skills: Use programming and GUI terminology accurately, explain the functionality of interface components, present and justify design decisions, and demonstrate completed applications clearly to different audiences.</p> <p>Self-management skills – Organization Organize code, project files, and interface components systematically, follow a structured development process, debug programs effectively, ensure interface consistency and accessibility, and manage time to meet project deadlines.</p> <p>Social Skills – Collaboration Collaborate effectively with peers during the design, development, testing, and refinement of GUI applications, share responsibilities, provide constructive feedback, and contribute to group problem-solving and decision-making.</p>	<p>Designing Interactive Graphical User Interfaces with Python Tkinter</p> <ul style="list-style-type: none"> • Introduction to GUI Development • Creating a Tkinter Window • Basic Widgets • User Input Widgets • Navigation and Advanced Components • Layout Management • Event-Driven Programming
MYP Objectives	<p>A – Inquiring & Analyzing B – Developing ideas C – Creating the solution D – Evaluating</p>		
Key concept	Development		
Related concepts	Systems Function Communication		
Global context	Scientific & Technical Innovation		
Statement of inquiry	<p>The development of graphical user interface systems enables users to interact efficiently with digital applications, demonstrating how scientific & technical innovation improves functionality & communication</p>		