Satit Prasarnmit
International Programme

Curriculum Pathways

Business & Technology Department

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Curriculum Pathway

Academic Year 2026-2027

Department: Business and Technology

Department Details	Assessment Types
Subject: Economics **Head of Department: Ken Vitas Somvongsiri** **Head of Department Email: vitas.so@spip.in.th** **Subject Teacher: Jiawei Zhu**	**Assessment Type 1: Class Assessments**
	Assessment Type 2: End of Unit Tests
	Assessment Type 3: Notebook
	Assessment Type 4: End of Term Tests
	Assessment Type 5: Class Participation
	Assessment Type 6: Mock Exam (Year 11, 12 and 13 only)

Year	Term	Unit(s) of Work	Core Knowledge & Concepts
10 IGCSE	1	The basic economic problem The allocation of resources	Students will: ● Understand the fundamental ideas and concepts that underpin the study of economics ● Define and give examples of the economic problem in the contexts of: consumers; workers; producers; and governments ● Learn the difference between economic goods and free goods ● Understand decisions made by consumers, workers, producers and governments when allocating their resources
	2	The allocation of resources (cont.)	Students will: ● Understand and explain price determination ● Gain an understanding of price elasticity of demand and supply with the aid of calculations ● Evaluate the advantages and disadvantages of market economic systems ● Cover the features, benefits and issues that can arise in the different types of economies: planned, market and free market, and the roles of the public and private sectors ● Understand causes and consequences of market failure are discussed which leads into cost-benefit framework and analysis
	3	Microeconomic decision makers	Students will: ● Learn the forms, functions and characteristics of money ● Understand the role and importance of central banks and commercial banks for government, producers and consumers ● Understand the influences on spending, saving and borrowing including income, the rate of interest and confidence between different households and over time.
11 IGCSE	1	Government and the macro economy	Students will: ● Understand that governments have different macroeconomic aims, and conflicts often arise between the measures used to achieve them. ● Discuss reasons behind the choice of aims and the criteria that governments set for each aim ● Learn possible conflicts between aims: full employment versus stable prices; economic growth versus balance of payments stability; and full employment versus balance of payments stability

	2	Economic development, international trade and globalisation	Students will: ● Study the effects of changes in the size and structure of population and of other influences on development in a variety of countries ● Learn the reasons for differences in living standards and income distribution within and between countries ● Understand the causes of poverty including unemployment, low wages, illness and age ● Discuss the concept of an optimum population. The effects of increases and decreases in population size and changes in the age and gender distribution of population
12 **AS Level**	1	Basic economic ideas and resource allocation The price system and the microeconomy Government microeconomic intervention	Students will: ● Understand the fundamental economic problem of scarcity and the need to make choices at all levels (individuals, firms, governments) ● Discuss the nature and definition of opportunity cost, arising from choices ● Study basic questions of resource allocation: what to produce, how to produce and for whom to produce ● Discuss price elasticity, income elasticity and cross elasticity of demand ● Learn about variations in price elasticity ● Study the factors affecting price elasticity of demand, income elasticity of demand and cross elasticity of demand ● Study the reasons for government intervention in markets: addressing the non-provision of public goods, over-consumption of demerit goods and the under-consumption of merit goods; controlling prices in markets
	2	The Macroeconomy Government macroeconomic intervention	Students will: ● Understand aggregate Demand and Aggregate Supply analysis: components and determinants of AD, shape of the AD curve (downward sloping) ● Study causes of a shift in the AD curve ● Learn the definition of Aggregate Supply (AS), determinants of AS ● Discuss government macroeconomic policy objectives and use of government policy to achieve macroeconomic objectives: price stability, low unemployment, economic growth ● Learn about Fiscal policy: government budget, deficit and surplus ● Study the meaning and significance of national income statistics and measures of economic growth ● Learn about international trade, trade and exchange rate policy and control of the balance of payments
13 **A Level**	1	The Price System and the Microeconomy Government Microeconomic intervention	Students will: ● Define and calculate measures of utility ● Learn about the uses and limitations of utility theory ● Study the equi-marginal principle ● Discuss efficiency - productive, allocative, dynamic and pareto efficiency ● Understand the reasons and measures of market failure ● Study government policies to correct market failure and redistribute income and wealth
	2	The Macroeconomy and Macroeconomic Policy International economic issues	Students will: ● Understand employment and taxation ● Understand the principles of money and banking ● Understand the basic principles of sustainable economic development ● Study different policy options used to achieve the government's macroeconomic objectives ● Understand the causes of disequilibrium in the balance of payments ● Study how to correct the disequilibrium in the balance of payments ● Learn about exchange rates - nominal, real and trade-weighted exchange rates ● Compare and contrast different measures of economic development ● Study the impact of globalisation on the relationships between countries at different stages of development

Curriculum Pathway

Academic Year 2026-2027

Department: Business and Technology

Department Details	Assessment Types
Subject: Business **Head of Department: Ken Vitas Somvongsiri** **Head of Department Email: vitas.so@spip.in.th** **Subject Teachers: Brandon Allen, Kevin Hall**	**Assessment Type 1: Class assessment** **Assessment Type 2: Notebook** **Assessment Type 3: Project** **Assessment Type 4: Worksheet** **Assessment Type 5: End-of-unit test** **Assessment Type 6: Mock exam (Year 11 IGCSE, AS and AL only)** **Assessment Type 7: End-of-term exam** **Assessment Type 8: End-of-year exam (Year 10 only)**

Year	Term	Unit(s) of Work	Core Knowledge & Concepts
10 IGCSE	1	Understanding business activity People in business	● Unit 1 introduces the underlying ideas and concepts of business and includes the purpose and nature of business activity and how businesses can be classified. Further topics include enterprise and entrepreneurs, types of business organization, and business and stakeholder objectives. ● Unit 2 focuses on the functional area of human resources and includes the importance and methods of motivating a workforce. How businesses are organized and managed and the methods of recruitment, selection and training of employees are also considered. ● Learners focus on developing knowledge and understanding of key concepts. ● Simple scenarios, case studies and diagrams are introduced so that students may start to apply the knowledge learned. ● Students are encouraged to look at media such as newspapers, internet and television to be aware of current business events, which will be discussed during lessons. ● Students will make effective use of relevant terminology, concepts and methods, and recognize the strengths and limitations of the ideas used in business. ● Learners will appreciate the perspectives of a range of stakeholders in relation to the business environment, individuals, society, government and enterprise.
	2	People in business (cont.) Marketing	● The final topic of unit 2 is completed as learners cover the importance and methods of effective internal and external communication. ● Unit 3 includes the role of marketing, the distinctions between niche and mass markets and the techniques of market segmentation. The methods and importance of market research are also covered. ● Students apply knowledge to simple scenarios using a range of activities. ● Students begin to focus on the skill of analysis in order to think about the implications of points through discussions and question and answer. ● Learners will distinguish between facts and opinions, and evaluate qualitative and quantitative data in order to help build arguments and make informed judgments. ● Learners are asked to apply their knowledge and critical understanding to current issues and problems in a wide range of business contexts.
	3	Marketing (cont.)	● Unit 3 is completed in term 3 as it considers the central role of the marketing mix including promotion, place, product and price, and the use of marketing strategies to influence consumer decisions at home and in new foreign markets. ● Students focus on the skill of evaluation by asking for opinions and decisions in given scenarios. ● Longer case study scenarios are introduced, including those from exam-style papers. ● Learners develop knowledge and understanding of the major groups and organizations within and outside business, and consider ways in which they are able to influence objectives, decisions and

			activities.
11 **IGCSE**	1	Operations management Financial information and financial decisions	● Unit 4 focuses on the functional area of production and includes the meaning and methods of production and how productivity can be increased. The different costs of production and break-even analysis are also covered. The section concludes with the importance and methods of achieving quality in the production process and location decisions of businesses. ● Unit 5 considers the topics of financial information and financial decisions and covers the need for and sources of business finance, cash-flow forecasting and working capital. Simple income statements are covered as well. ● A range of activities are continued in order to enable students to practice each of the four skills. ● Basic revision skills and exam techniques for external exams are introduced. ● Students develop knowledge and understanding of how the main types of businesses are organized, financed and operated, and how their relations with other organizations, consumers, employees, owners and society are regulated. ● Learners develop skills of numeracy, literacy, enquiry, selection and use of relevant sources of information, presentation and interpretation.
	2	Financial information and decisions (cont.) External influences on business activity	● Unit 5 will continue with financial information and decisions focusing on statements of financial position and the analysis of accounts including why and how accounts are used. ● Unit 6 focuses on different external influences on business activity and how these impact on a business. It includes government influences on economic, environmental and ethical issues and how they impact on the functional areas of businesses. In addition, the international economy including globalization and its effects on businesses and governments, multinational businesses and exchange rates are important issues. ● Learners develop an awareness of the nature and significance of innovation and change within the context of business activities.
	3	Revision	● Students focus on developing examination techniques including command words, question focus, and time management. ● Learners acquire a foundation for further study of business or other subjects.
12 **AS Level**	1	Business and its environment Human resource management Marketing	● Business and its environment is concerned with understanding the nature and purpose of business activity and identifying structures, functions, cultures and objectives of different business organizations. The impact of political, economic, social, technological, legal, environmental and ethical factors and how these might influence business activity is considered. ● People in organizations focuses on how businesses can develop and use policies, procedures, structures, systems and approaches to management and leadership that will harness the human potential within the organization and achieve organizational goals. The importance of motivation techniques and theories in understanding employee needs will be considered. The contribution to business success made by human resource management through effective workforce planning and the recruitment, selection and training of workers will also be explored. ● Marketing develops an understanding of the importance of the marketing function for business competitiveness. Learners will understand that the central idea of marketing is the objective of satisfying the needs and wants of customers through effective market research, applying an appropriate marketing mix and establishing an organization with a strong customer focus. ● Learners will gain an understanding of business concepts and their application to business situations. ● Learners will understand and appreciate the nature and scope of business, and the role of business in society, internationally and within Thailand. ● Students gain the capacity to analyze characteristics and activities of business organizations and how they respond to the changing demands of their environments.
	2	Marketing (cont.) Operations management Finance and accounting	● Term 2 continues with marketing in order to help students understand the relationship between marketing and other business functions such as operations management, finance and human resource management. ● Operations management is the discipline of how resources are managed to achieve the efficient production and provision of goods and services. Learners develop an understanding of the benefits and limitations of a variety of techniques and analytical frameworks used by operations and project managers. Central to the understanding of how successful operations and project management support effective manufacturing and service businesses is a recognition of the importance of innovation in product and service delivery in dynamic and volatile business environments. ● Finance and accounting introduces students to the importance of the management of finance, the keeping of and analysis of accounts, and the assessment of business financial performance. Students will consider the basic principles and techniques of financial management, the value of financial statements and some key accounting techniques used to promote profit, measure performance and exert control in business organizations, and the use of financial management information in managerial decision making. ● Students develop quantitative, problem-solving, decision-making and communication skills.
	3	Revision	● Students focus on developing examination techniques including command words, question focus, and time management. ● Learners acquire a foundation for further study of business or other subjects.
13 **A Level**	1	Business and its environment Human resource management	● Business and its environment is concerned with understanding the nature and purpose of business activity and identifying structures, functions, cultures and objectives of different business organizations. ● Students will use awareness of business concepts to make decisions and develop plans of action that

		Marketing Operations management	would allow a business to react positively to external changes. Emphasis is on recognizing the potential conflict between objectives and the resolution of such conflicts. There should be an appreciation of the nature of the uncertain business environment and the development of business plans of action which aim to respond effectively to the changing business environment. ● The people in organizations unit focuses on how businesses can develop and use policies, procedures, structures, systems and approaches to management and leadership that will harness the human potential within the organization and achieve organizational goals. ● Learners understand the interrelationship between organizational structure, leadership style and management of people within a business. Learners will be expected to evaluate the implications of these for the effective planning and management of human resources. ● Marketing will develop an understanding of the importance of the marketing function for business competitiveness as well as the significance of market orientation. The emphasis of this unit is on using marketing concepts to develop strategies and evaluate changing situations and options. ● Operations and project management will discuss how resources are managed to achieve the efficient production and provision of goods and services. This topic area promotes understanding of operations and project decisions and how design, planning, quality and workforce issues interrelate to achieve operations and project objectives.
	2	Operations management (cont.) Finance and accounting Strategic management	● Term 2 continues with operations and project management in order to help students develop an understanding of the benefits and limitations of a variety of techniques and analytical frameworks used by operations and project managers. Central to the understanding of how successful operations and project management support effective manufacturing and service businesses is a recognition of the importance of innovation in product and service delivery in dynamic and volatile business environments. ● Finance and accounting will introduce students to the importance of the management of finance, the keeping of an analysis of accounts, and the assessment of business and financial performance. Students use accounting information to aid strategic decision making and to evaluate the performance of a business and business investment projects in financial terms. ● Strategic management explores business concepts and theories and considers why strategy is practiced in a range of business contexts. Strategy in business is concerned with the key decisions that are taken to ensure that businesses survive and succeed in the long term. Such decisions often involve initiating and managing major change policies and programs. The topic area investigates the strategic management process model of strategic analysis, strategic choice and strategic implementation. The associated strategic thinking and analysis tools that help to frame choices and put resulting strategies into action are also considered.
	3	Revision	● Students focus on developing examination techniques including command words, question focus, and time management. ● Learners acquire a foundation for further study of business or other subjects.

Curriculum Pathway

Academic Year 2026-2027

Department: Business and Technology

Department Details	Assessment Types
Subject: Computer Science **Head of Department: Ken Vitas Somvongsiri** **Head of Department Email: vitas.so@spip.in.th** **Subject Teacher: Shilpa Chauhan, Christain Makane**	**Assessment Type 1: Class Assessments** **Assessment Type 2: End of Unit tests/Interactive Quizzes** **Assessment Type 3: Projects** **Assessment Type 4: End of Term Tests** **Assessment Type 5: Mock Exam (Year 11,12 &13)**

Year	Term	Unit/s of Work	Core Knowledge & Concepts
10 IGCSE	1	Data Representation	Students will: ● Perform logical left and right binary shifts on 8-bit positive integers. ● Understand how shifting bits affects the value of a binary number. ● Perform multiple binary shifts. ● Understand that bits shifted out are lost and zeros are shifted in. ● Use two's complement to represent positive and negative 8-bit integers. ● Convert between binary, denary and two's complement representations. ● Understand how computers represent text using binary. ● Understand and use ASCII and Unicode character sets. ● Compare ASCII and Unicode, including their ability to represent different languages and symbols. ● Understand how sound is converted into digital form through sampling. ● Understand sample rate and sample resolution and their effect on sound quality and file size. ● Understand how images are represented using pixels. ● Understand resolution and color depth and how they affect image quality and file size. ● Understand how data storage is measured using bits, bytes, KiB, MiB, GiB, TiB, PiB and EiB. ● Convert between different storage units using 1024. ● Calculate the file size of images and sound files. ● Understand why data compression is needed. ● Explain how compression can reduce storage space, bandwidth requirements and transmission time. ● Understand the difference between lossy and lossless compression. ● Understand that lossy compression permanently removes some data, while lossless compression retains the original data.
		Data Transmission	● Understand how data is broken into packets for transmission. ● Identify the main parts of a packet: header, payload and trailer. ● Understand the information stored in a packet header, including source/destination address and packet number. ● Explain packet switching, including how packets can take different routes and arrive out of order. ● Understand how routers determine the route of packets. ● Understand different data transmission methods: serial, parallel, simplex, half-duplex and full-duplex. ● Compare the advantages, disadvantages and suitability of each transmission method for different scenarios. ● Understand the USB interface and how it is used to transmit data. ● Understand why errors can occur during data transmission and why error checking is necessary. ● Understand how parity checks detect errors, including odd and even parity. ● Understand and apply checksums and echo checks. ● Understand how check digits detect errors in data entry. ● Identify applications of check digits, such as ISBNs and barcodes. ● Understand how Automatic Repeat reQuest (ARQ) ensures data is received correctly. ● Understand the use of positive/negative acknowledgements and timeouts in ARQ.

		Hardware	● Understand why encryption is needed when transmitting data. ● Understand how encryption helps to protect data from unauthorized access. ● Understand symmetric encryption, where the same key is used to encrypt and decrypt data. ● Understand asymmetric encryption, where different keys are used for encryption and decryption. ● Understand the role of the CPU in processing instructions and data. ● Understand what a microprocessor is. ● Identify the main CPU components: ALU, Control Unit, registers and buses. ● Understand the purpose of key registers: PC, MAR, MDR, CIR and ACC. ● Explain the Fetch–Decode–Execute (FDE) cycle step by step. ● Understand the role of cores, cache and clock speed in CPU performance. ● Understand what a CPU instruction set is and how machine-code instructions are processed. ● Understand embedded systems, their characteristics and common applications. ● Understand the difference between input and output devices and why they are needed. ● Identify and explain common input devices such as keyboard, mouse, microphone, camera, barcode/QR scanner and touch screen. ● Identify common output devices such as printers, screens, projectors, speakers, actuators and 3D printers. ● Understand what sensors are and why they are used. ● Identify different sensors, including temperature, light, pressure, proximity, humidity, moisture, gas, pH, sound and accelerometer sensors. ● Select the most suitable sensor for a given situation. ● Understand primary and secondary storage. ● Understand the roles and differences between RAM and ROM. ● Explain how magnetic, optical and solid-state storage work. ● Identify examples such as HDD, CD/DVD/Blu-ray, SSD, USB drives and SD cards. ● Understand virtual memory, how it works and why it is needed. ● Understand cloud storage and how it differs from local storage. ● Compare the advantages and disadvantages of cloud storage and local storage. ● Understand why a computer needs a Network Interface Card (NIC). ● Understand what a MAC address is, including its structure and purpose. ● Understand what an IP address is and why it is needed. ● Recognize that there are different types of IP addresses. ● Understand the role of a router in a network.
	2	Software	Students will: ● Understand the difference between system software and application software and give examples. ● Understand the role and functions of an operating system. ● Learn how the hardware, firmware, operating system and application software work together. ● Understand how the boot process works from hardware → firmware → operating system → applications. ● Understand what an interrupt is and why it occurs. ● Explain how hardware and software interrupts are generated and handled. ● Understand the role of an Interrupt Service Routine (ISR). ● Understand the difference between high-level and low-level programming languages. ● Compare their advantages and disadvantages, including readability, debugging, portability and hardware control. ● Understand assembly language, mnemonics and the role of an assembler. ● Understand how a compiler translates and executes high-level programs. ● Understand how an interpreter translates and executes programs line by line. ● Compare the advantages and disadvantages of compilers and interpreters. ● Understand how errors are reported by compilers and interpreters. ● Understand the purpose of an Integrated Development Environment (IDE). ● Identify common IDE features such as code editing, run-time environment, translators, error diagnostics, auto-completion, auto-correction and pretty printing.
		The internet and its uses	● Understand how a web page is located, retrieved and displayed when a URL is entered. ● Understand the roles of the web browser, IP address, DNS, web server and HTML. ● Understand what cookies are and why websites use them. ● Differentiate between session cookies and persistent cookies. ● Understand how cookies can store login details, preferences, personal information and shopping-cart items. ● Understand what digital currency is and how it is used. ● Understand the basic concept of blockchain technology. ● Explain how blockchain acts as a digital ledger for recording transactions. ● Understand how blockchain records are time-stamped and designed to prevent alteration. ● Understand how blockchain is used to track digital currency transactions. ● Understand common cyber security threats and their purposes. ● Explain how attacks such as brute-force, data interception, DDoS, hacking, malware, pharming, phishing and social engineering work. ● Identify different types of malware, including viruses, worms, Trojan horses, spyware, adware and ransomware.

		Automated and emerging technologies	● Understand different methods of protecting data and systems from security threats. ● Learn how security solutions can be used to keep data safe and reduce the risk of cyber attacks. ● Understand how sensors, microprocessors and actuators work together in automated systems. ● Explain how automated systems collect data, process information and perform actions. ● Apply automated systems to scenarios in industry, transport, agriculture, weather, gaming, lighting and science. ● Analyse the advantages and disadvantages of automated systems in different situations. ● Understand what robotics is. ● Identify the main characteristics and components of robots. ● Understand that robots have a mechanical structure, electrical components and programmable systems. ● Understand the roles of sensors, microprocessors and actuators in robots. ● Identify how robots are used in industry, transport, agriculture, medicine, homes and entertainment. ● Evaluate the advantages and disadvantages of using robots. ● Understand what Artificial Intelligence (AI) means. ● Understand how AI attempts to simulate intelligent human behaviour. ● Identify key characteristics of AI, including data collection, reasoning, learning and adapting. ● Understand the basic components and operation of AI systems. ● Learn about expert systems, including the knowledge base, rule base, inference engine and user interface. ● Understand machine learning and how programs can automatically adapt their processes or data.
	3	Algorithm design and problem solving (part 1)	Students will: ● Understand the program development life cycle: analysis, design, coding and testing. ● Analyze a problem by identifying requirements, inputs, processes, outputs and storage. ● Understand abstraction and decomposition and use them to break complex problems into smaller parts. ● Design solutions using structure diagrams, flowcharts and pseudocode. ● Understand and explain the purpose and processes of an algorithm. ● Learn standard problem-solving algorithms, including: ○ Linear search ○ Bubble sort ○ Totaling ○ Counting ● Finding maximum, minimum and average values. ● Understand the difference between validation and verification. ● Apply validation checks such as range, length, type, presence, format and check digit. ● Understand verification methods such as visual checks and double-entry checks. ● Select suitable test data, including normal, abnormal, extreme and boundary data. ● Complete trace tables to perform a dry run of an algorithm. ● Identify and correct errors in algorithms. ● Write and modify solutions using pseudocode, program code and flowcharts. ● Develop accurate algorithms using variables, user prompts and outputs at each stage. ● Practice iterative testing and debugging to improve program solutions.
11 IGCSE	1	Algorithm design and problem solving (part 2)	Students will: ● Declare and use variables and constants. ● Understand and use basic data types: integer, real, char, string and Boolean. ● Use input and output in programs. ● Understand and apply the three basic programming structures: ● Sequence ● Selection using IF and CASE ● Iteration using count-controlled, pre-condition and post-condition loops ● Use totaling and counting techniques. ● Perform string handling, including length, substring, upper and lower case. ● Use arithmetic, relational and logical operators. ● Understand and create nested statements, including nested selection and iteration. ● Understand and use procedures, functions and parameters. ● Use local and global variables appropriately. ● Use common library routines, such as MOD, DIV, ROUND and RANDOM. ● Develop maintainable programs using meaningful identifiers, functions/procedures and appropriate comments. ● Declare and use 1D and 2D arrays. ● Understand why arrays are useful for storing and managing collections of data. ● Read from and write to arrays using iteration. ● Use array indexes and variables as indexes. ● Use nested loops when working with 2D arrays. ● Understand why programs store data in files. ● Open and close files correctly. ● Read data from files.

		Databases	● Write data to files. ● Use file handling to allow data to be stored and reused by programs. ● Understand the structure of a single-table database. ● Identify and create fields and records based on data requirements. ● Select suitable data types, such as text, character, Boolean, integer, real and date/time. ● Understand the purpose of validation when entering data. ● Understand what a primary key is and select an appropriate primary key. ● Read, interpret and complete SQL queries. ○ Use SQL commands such as: ○ SELECT and FROM ○ WHERE ○ ORDER BY ascending and descending ○ SUM and COUNT ○ AND and OR ● Predict and explain the output produced by SQL queries.
		Logic Gates	● Identify and use standard logic gate symbols. ● Understand the functions of AND, OR and NOT gates and other standard logic gates. ● Create logic circuits from: ● Problem statements ● Logic expressions ● Truth tables ● Complete truth tables from problem statements, logic expressions and circuits. ● Write logic expressions from problem statements, logic circuits and truth tables. ● Apply Boolean logic to solve and design digital logic problems.
	2	Use of pre-release materials Revision and exam preparation	
12 AS-Level	1	Information Representation	Students will: ● Understand binary, denary and hexadecimal number systems and binary prefixes such as kibi, mebi, gibi and tebi. ● Convert between different number bases and representations. ● Perform binary addition and subtraction, including positive and negative numbers. ● Understand and identify binary overflow. ● Understand and use BCD, one's complement and two's complement. ● Understand how ASCII, extended ASCII and Unicode represent characters. ● Understand how bitmap and vector graphics are represented. ● Calculate bitmap file sizes and understand the effect of resolution and colour depth. ● Understand how digital sound is represented through sampling and sampling rate/resolution. ● Understand lossy and lossless compression, including Run-Length Encoding (RLE).
		Communication	● Understand LANs, WANs, client-server and peer-to-peer networks. ● Compare thin-client and thick-client systems. ● Understand and evaluate bus, star, mesh and hybrid topologies. ● Understand packet transmission across different network topologies. ● Understand cloud computing and its advantages and disadvantages. ● Compare wired and wireless communication technologies. ● Understand different transmission media, including copper, fibre-optic, Wi-Fi, microwave and satellite. ● Identify LAN hardware such as switches, servers, NICs, WNICs, WAPs, bridges and repeaters. ● Understand the role of routers and Ethernet/CSMA-CD. ● Understand bit streaming, including real-time and on-demand streaming. ● Distinguish between the Internet and World Wide Web. ● Understand hardware supporting the Internet, including modems and communication networks. ● Understand IPv4, IPv6, subnetting, public/private and static/dynamic IP addresses. ● Understand how URLs and DNS locate resources on the Web.
		Hardware	● Understand the need for **input, output, primary memory and secondary storage**. ● Understand **embedded systems** and evaluate their benefits and drawbacks. ● Explain the operation of hardware such as **printers, microphones, speakers, storage devices, touchscreens and VR headsets**. ● Understand the purpose of **buffers**. ● Compare **RAM and ROM**. ● Understand **SRAM and DRAM**, including where and why they are used. ● Understand **PROM, EPROM and EEPROM**. ● Understand **monitoring and control systems**, including sensors, actuators and feedback.

		Logic Gates and Logic Circuits	● Understand NOT, AND, OR, NAND, NOR and XOR gates. ● Construct truth tables for logic gates and circuits. ● Create logic circuits from problem statements, logic expressions and truth tables. ● Create logic expressions from circuits and truth tables. ● Apply Boolean logic to solve digital circuit problems.
		Processor Fundamentals	● Understand the Von Neumann architecture and stored-program concept. ● Understand CPU registers, including PC, MDR, MAR, ACC, IX, CIR and Status Register. ● Understand the roles of the ALU, CU, system clock and IAS. ● Understand address, data and control buses. ● Analyse factors affecting CPU performance, including cores, bus width, clock speed and cache. ● Understand common ports such as USB, HDMI and VGA. ● Explain and trace the Fetch–Execute cycle using register-transfer notation. ● Understand interrupts and Interrupt Service Routines (ISRs).
		Assembly Language and Bit Manipulation	● Understand the relationship between assembly language and machine code. ● Understand and apply the two-pass assembler process. ● Trace simple assembly language programs. ● Understand instruction groups such as data movement, I/O, arithmetic, branching and comparison. ● Use different addressing modes: immediate, direct, indirect, indexed and relative. ● Perform logical, arithmetic and cyclic binary shifts. ● Use bit manipulation and bit masking to test and set bits. ● Understand how bit manipulation can be used to monitor and control devices.
		System Software	● Understand why an **Operating System (OS)** is required. ● Understand OS management of **memory, files, security, hardware and processes**. ● Understand the purpose of utility software such as **virus checkers, backup, compression, disk repair and defragmentation tools**. ● Understand **program libraries** and the benefits of reusable code such as DLLs. ● Understand the roles of **assemblers, compilers and interpreters**. ● Compare the advantages and disadvantages of **compilation and interpretation**. ● Understand **IDE features** for coding, error detection, presentation and debugging.
		Security Privacy & Data Integrity	● Distinguish between security, privacy and data integrity. ● Understand threats such as malware, hacking, phishing and pharming. ● Understand security measures including passwords, authentication, biometrics, firewalls, anti-virus, anti-spyware and encryption. ● Understand how access rights and encryption protect data. ● Apply validation and verification techniques. ● Use validation methods such as range, format, length, presence, existence, limit and check-digit checks. ● Use verification methods such as visual checks, double entry, parity and checksums.
		Ethics & Ownership	● Explain the need for ethics and to act ethically. ● Discuss the impact of acting ethically and unethically. ● Identify ways a person can act ethically and/or unethically in a given situation. ● Describe the key features of a range of software licenses. ● Identify the need for Artificial Intelligence (AI). ● Discuss the benefits and drawbacks of AI.
		Databases	● Understand the limitations of file-based data storage. ● Understand relational databases and their advantages. ● Use database terminology including entity, table, record, field, primary key, candidate key, foreign key and relationships. ● Understand referential integrity and indexing. ● Design databases using Entity-Relationship (E-R) diagrams. ● Understand and apply 1NF, 2NF and 3NF normalisation. ● Understand the role and features of a Database Management System (DBMS). ● Use DDL and DML in SQL. ● Create and modify databases and tables.

			● Write SQL queries using SELECT, WHERE, ORDER BY, GROUP BY, INNER JOIN, SUM, COUNT and AVG. ● Modify data using INSERT, DELETE and UPDATE.
		Algorithm Design and Problem Solving	● Explain the purpose of and need for abstraction. ● Create an abstract model of a system. ● Explain the purpose of and need for decomposition. ● Decompose a problem into its sub-problems. ● Select appropriate identifier names. ● Write programs in pseudocode using input, process and output.
		Data Types and Structures	● Select and use appropriate data types for a problem solution. ● Use a record structure to hold a set of different data types under one identifier. ● Use the technical terms associated with arrays. ● Select a suitable data structure (1D or 2D array) to use for a given task. ● Write pseudocode for 1D and 2D arrays.
		Programming	● Write pseudocode from a given design presented as either a program flowchart or structured English. ● Write pseudocode statements for: ○ the declaration of variables and constants ○ the assignment of values to variables and constants ○ expressions involving any of the arithmetic or logical operators input from the keyboard and output to the console ● Use pseudocode to write: ○ an IF structure including ELSE and nested IF statements ○ a CASE statement ○ a count-controlled loop ○ a post-condition loop ○ a precondition loop
	2	Software Development Use of pre-release materials Revision and exam preparation	Students will: ● Understand different software development life cycles. ● Compare Waterfall, Iterative and Rapid Application Development (RAD). ● Understand the stages of analysis, design, coding, testing and maintenance. ● Use structure charts to decompose programs into modules. ● Understand and create state-transition diagrams. ● Identify and correct syntax, logic and run-time errors. ● Apply testing methods such as dry runs, walkthroughs, white-box, black-box, integration, alpha, beta and acceptance testing. ● Select appropriate normal, abnormal and boundary/extreme test data. ● Create test strategies and test plans. ● Understand perfective, adaptive and corrective maintenance. ● Analyze existing programs and make improvements.
Y13 A-Level	1	Data Representation Communication and internet technologies	Students will: ● Explain User defined data types ● Define and use non-composite types Including enumerated, pointer ● Define and use composite data types Including set, record and class / object ● Choose and design an appropriate user-defined datatype for a given problem ● Explain the methods of file organisation and select an appropriate method of file organisation and file access for a given problem Including serial, sequential (using a key field), random (using a record key) ● Explain methods of file access Including Sequential access for serial and sequential files ● Explain why a protocol is essential for communication between computers ● Understand why network protocols are necessary. ● Understand the TCP/IP protocol stack and its four layers. ● Understand protocols such as HTTP, FTP, POP3, IMAP, SMTP and BitTorrent. ● Compare circuit switching and packet switching. ● Understand how routers transmit packets across networks.

		Hardware and Virtual Machines	• Compare **RISC and CISC processors**. • Understand **interrupt handling, pipelining and registers**. • Understand computer architectures: **SISD, SIMD, MISD and MIMD**. • Understand **massively parallel computers**. • Understand **virtual machines**, including their uses, benefits and limitations. • Understand **half adders, full adders and flip-flops**. • Apply **Boolean algebra and De Morgan's laws**. • Simplify logic circuits using **Boolean algebra and Karnaugh maps**.
		System Software	• Understand how an OS manages **processes and system resources**. • Understand **multitasking and process states**: running, ready and blocked. • Understand CPU scheduling algorithms such as **Round Robin, Shortest Job First, First Come First Served and Shortest Remaining Time**. • Understand **virtual memory, paging and segmentation**. • Understand page replacement and **disk thrashing**. • Understand the stages of compilation: **lexical analysis, syntax analysis, code generation and optimisation**. • Understand **syntax diagrams, BNF and Reverse Polish Notation (RPN)**.
		Security	• Understand **symmetric and asymmetric encryption** in greater depth. • Understand **public and private keys** and their uses. • Understand **SSL/TLS** and secure client-server communication. • Understand **digital certificates and digital signatures**. • Explore the purpose, benefits and limitations of **quantum cryptography**.
	2	Artificial Intelligence (AI)	Students will: • Understand how **graphs** are used in AI. • Use **A*** and **Dijkstra's algorithms** for graph searches. • Understand **artificial neural networks**. • Understand **machine learning, deep learning and reinforcement learning**. • Compare **supervised and unsupervised learning**. • Understand **backpropagation and regression**.
		Algorithms	• Implement linear and binary searches. • Understand when binary search is appropriate. • Implement insertion sort and bubble sort. • Work with advanced ADTs including linked lists, stacks, queues, dictionaries and binary trees. • Understand and use graphs as an ADT. • Compare algorithms based on time and memory efficiency. • Understand Big O notation and algorithm complexity. • Understand and implement recursion. • Trace recursive algorithms and understand stacks and unwinding. • Show understanding of recursion
		Recursion	• Write and trace recursive algorithms • Show awareness of what a compiler has to do to translate recursive programming code
		Further Programming	• Understand different programming paradigms. • Develop programs using low-level, procedural, object-oriented and declarative programming. • Understand key OOP concepts such as classes, objects, inheritance, polymorphism, encapsulation, methods and attributes. • Work with file processing, including serial, sequential and random files. • Understand exceptions and exception handling. • Write programs that use appropriate exception-handling techniques.

Satit Prasarnmit International Programme

Curriculum Pathway

Academic Year 2026-2027

Department: Business and Technology

Department Details	Assessment Types
Subject: KS3 Computing **Head of Department: Ken Vitas Somvongsiri** **Head of Department Email: vitas.so@spip.in.th** **Subject Teacher(s): Joe O'Sullivan, Christian Makane**	**Assessment Type 1: Class Assessments** **Assessment Type 2: Worksheets** **Assessment Type 3: Projects**

Year	Term	Unit/s of Work	Core Knowledge & Concepts
7	1	Hands On: Google Workspace and Microsoft suite.	● Google Drive File management - file types, creating, moving, copying, deleting, downloading files ● Windows File Management - Microsoft Files - file types, creating, moving, deleting, copying ● Google Forms - Creation and Analysis ● Google sheets - Creation, data entry, sorting, filtering, built-in functions, custom functions ● Google Slides - Data Presentation
		History of Computers	● Historical context and purpose of computing devices. ● Exploration of the evolution of computing devices from early mechanical calculators to modern computers. ● Understanding the motivations behind the invention of computers, focusing on problem-solving and automation.
		Computing hardware and software	● The difference between hardware and software ● Input and output devices ● Storage
		Encoding and representation:	● Historical encoding - Morse code and Braille ● Text representation in computing - Character encoding in ASCII
		Binary numbers	● Basics of the binary number system: understanding bits and bytes, and why computers use binary. ● Binary to decimal conversion ● Decimal to binary conversion
	2	Image representation	● The basics of how images are represented in computers ● Bits, bytes and Units of memory. ● Pixels ● Color models (RGB)
		Web design	● How the web works ● File setup ● HTML, tags and the web page skeleton ● Exploring the main HTML elements ● Positioning elements - Divs and Bootstrap
		Python Basics	● Python comments ● Python print() function - 'Hello world!', printing string literals ● Assigning values to variables - printing string variables ● Sending mixed arguments to the print function ● Data types - str, float, int, bool and the type() function ● Taking user input ● Converting data types

			● Concatenation and f-strings ● Decision structures
	3	Python projects	● Game character creation project ● Pizza order system ● Sport club selector ● Music playlist manager ● Supermarket checkout project ● Movie recommendation system
8	1	Number Systems Representation Networks	● Explaining the importance of binary and hexadecimal numbers and uses ● Converting BInary numbers to decimal and vice versa ● Converting BInary numbers to hexadecimal and vice versa ● Converting Binary to Hexadecimal and vIce versa ● Text representation - revisiting ASCII ● Introducing Unicode ● Image representation ● Pixels, bits, bytes and units of memory ● Image resolution, color depth, color depth level and image usage. ● Data compression, lossy and lossless algorithms, file sizes. ● Sound representation ● Sampling and samples ● Bit depth and sample resolution, ● File size and compression ● LAN and WAN ● Protocols, IP and MAC addresses ● Data transmission and packeting
	2	Python - Review and Develop: The print() function Python data types Print formatting Taking user input Lists Conditional structures Iteration	● Sending string literals and string variables to the print function ● Updating variable values and printing updated values. ● Sending multiple values to the print function, (mixed literal and assigned values) ● Str, int, float, bool, list ● The type() function - print(type) ● String functions upper(), lower() ● The str() function ● Spacing, f-Strings and concatenation ● The input() function, and variable assignment ● Personal profile project - taking, formatting and displaying user input ● Declaring lists of different and mixed data types ● Storing variable values in lists ● Printing lists ● Zero based indexing, Accessing and printing values in lists ● List functions: len(), sum(), max(), min(), append(), insert(), remove(), del keyword, pop(), sort(), sorted() ● If conditionals and binary branching ● Multiple if statements Vs multiple branching ● Secondary colors project - mixed binary branching and multiple branching structures ● For loops - count controlled, iterative repetition of tasks ● For each loops for list iteration ● While loops incrementing count variable
	3	Python projects	● Python Quiz game project ● Python school shop project ● Python adventure game project
9	1	Cracking the code: binary characters, ciphers and encryption Python	● Understanding binary representation of data, including characters and numbers. ● Introduction to basic encryption techniques, ciphers, and their role in securing information. ● Python variables ● Python data structures ● Python decision structures ● Python iteration

			● Writing simple code
	2	Computer Networks Intermediate Python	● Understanding binary representation of data, including characters and numbers. ● Introduction to basic encryption techniques, ciphers, and their role in securing information. ● Basic networking concepts. ● Exploration of network types, topologies, and devices. ● Network management and security considerations. ● Intermediate python coding. ● Learning to write python code from scratch.
	3	Exploring Python Code and Projects	● Number Guessing Game ● Magic 8 Ball ● Simple Calculator ● Quiz Game ● Rock, Paper, Scissors ● To-Do List ● Dice Roller Simulator ● Basic Password Generator ● Days Until My Birthday ● Even or Odd Checker

Curriculum Pathway

Academic Year 2026-2027

Department: Business and Technology

Department Details	Assessment Types
Subject: Enterprise **Head of Department: Ken Vitas Somvongsiri** **Head of Department Email: vitas.so@spip.in.th** **Subject Teacher: Kevin Hall**	**Assessment Type 1: Class Assessments** **Assessment Type 2: Coursework** **Assessment Type 3: Workbook** **Assessment Type 4: End of Term Tests** **Assessment Type 5: Mock Exam (Year 11 only)**

Year	Term	Unit/s of Work	Core Knowledge & Concepts
10 IGCSE	1	**1) Introduction to enterprise** 1.1 What is meant by enterprise 1.2 Ways for students to be enterprising in everyday life **2) Setting up a new enterprise** 2.1 The enterprise process **3) Enterprise skills** 3.1 Skills of enterprising people 3.2 Behaviours of entrepreneurs **4) Enterprise opportunities, risk, legal obligations and ethical considerations** 4.1 Opportunities 4.2 Risk 4.3 Legal obligations 4.4 Ethical considerations **6) Finance** 6.4 Financial records (costs & break-even) **8) Markets and customers** 8.2 Market research **Task 1 – Choosing a suitable project or activity**	Students will: • Understand enterprise capability (being innovative, creative, taking and managing risks, positive attitude). • Identify the difference between a business enterprise and social enterprise. • Identify different types of stakeholders including. • Describe ways of enterprising including. • Identify and explain the six stages of the enterprise process. • Develop the ability to work in an enterprising and independent way. • Recognise enterprise skills and that some people have these skills naturally and others have to develop them. • Understand how entrepreneur use their enterprise skills. • Identify how opportunities for an enterprise may arise. • Identify, analyse and manage risk to an enterprise. • Understand laws and regulations are need to protect stakeholders. • Consider how an enterprise may have an impact on communities and society. • Understand and conduct methods of identifying potential customers and the effectiveness of those methods. • Develop their enterprise skills by planning and implementing their own enterprise project • Make effective use of relevant terms, concepts and methods when discussing enterprise and enterprising behaviour. • Outline and analyse advantages and disadvantages of each idea. • Collect, present and analyse appropriate data (e.g. market research or SWOT) for each possible idea. • Give a detailed explanation of the reasons for the choice of project and a justified decision, including why other idea(s) were rejected. • Define, explain and prepare total costs and break-even point.
	2	**7) Business planning** 7.1 Business objectives 7.2 Action plans 7.3 Business plans **Task 2A – Planning the project** **6) Finance** 6.1 Sources of finance 6.2 The concept of trade credit 6.3 Financial terms 6.4 Financial records (cashflow) **5) Negotiation**	Students will: ● Understand different enterprises have different aims and objectives. ● Explain how aims influence the activities of enterprises. ● Understand the purpose and importance of action plans. ● Identify the Contents of action plans. ● Define methods of monitoring action plans. ● Understand the importance of updating action plans. ● Understand the purpose and importance of business plans. ● Identify the Contents of business plans. ● Define methods of monitoring business plans. ● Understand the importance of updating business plans. ● Identify of potential problems and solutions for two or three activities from the action plan ● Apply knowledge and critical understanding to familiar and unfamiliar enterprise problems and issues

		5.1 The negotiation process **8) Markets and customers** 8.1 The purpose of marketing 8.3 Customer retention 8.4 Marketing communications **10) Communication** 10.2 Meetings and presentations **Task 2B – Planning for financing the project** **OR** **Planning marketing communications**	● Explore and find solutions to enterprise problems and issues ● Explain the advantages and disadvantages of different sources of start-up funding. ● Explain the advantages and disadvantages of different sources of funding for continuing trade and expansion. ● Explain the advantages and disadvantages of trade credit. ● Define, explain and prepare cash flow forecast. ● Understand the purpose and importance of keeping accurate financial records. ● Understand and explain the stages in the negotiation process. ● Understand who marketing helps achieve enterprise aims. ● Understand marketing from the perspective of customers. ● Identify methods of identifying potential customers. ● Explain the effectiveness of marketing methods for different enterprises. ● Understand the reasons for retaining customers. ● Identify methods of measuring customer satisfaction and retention. ● Identify methods of retaining existing customers. ● Understand Methods of marketing communication to reach intended customers. ● Select appropriate methods for different enterprises.
	3	**Task 3 – Implementing the plan**	Students will: ● Use enterprise skills to implement the plan ● Create and deliver a product at the SPIP Market Day. ● Develop communication materials appropriate for the intended audience and purpose
11 IGCSE	1	**6) Finance** 6.4 Financial records (income statements) **2) Setting up a new enterprise** 2.2 Types of business organisation **9) Help and support for enterprise** 9.1 Sources of help and support **10) Communication** 10.1 Types of communication **Task 4 – Evaluating the project**	Students will: ● Define, explain and prepare an income statement. ● Identify and explain different kinds of organisation. ● Understand formal sources and the assistance they offer. ● Understand informal sources and the assistance they offer. ● Explain the suitability of different sources of help and support for the enterprise. ● Identify formal and informal communication. ● Understand Verbal and non-verbal communication. ● Select the appropriateness of different types of communication for communicating with internal and external stakeholders ● Analyse, interpret, and evaluate information ● Demonstrate knowledge and understanding of the concepts, skills and terminology relating to enterprise.
	2	**Revision of Chapters 1-10** **Exam paper practice**	Students will: ● Demonstrate knowledge and understanding of the concepts, skills and terminology relating to enterprise. ● Apply knowledge and understanding of enterprise concepts to a variety of different contexts. ● Use analysis to effectively build arguments. ● Be able to identify the effects and consequences of enterprise knowledge. ● Use evaluation to make a decision based upon prior analysis. ● Be able to make a justified decision, explain why a decision was made and why not make a different decision.

Satit Prasarnmit International Programme

Curriculum Pathway

Academic Year 2026-2027

Department: Business and Technology

Department Details	Assessment Types
Subject: Financial Literacy **Head of Department: Ken Vitas Somvongsiri** **Head of Department Email: vitas.so@spip.in.th** **Subject Teacher: Joe O'Sullivan, Christain Makane, Jiawei Zhu** **Kevin Hall**	**Assessment Type 1: Classwork** **Assessment Type 2: Projects**

Year	Term	Unit/s of Work	Core Knowledge & Concepts
7	1	Money in Our Lives Consumer Skills Budgeting	Students will: ● Identify their money personality based on personal behavior and choices ● Prioritize goals and values when faced with spending decisions ● Explain the importance of having goals for their future ● Choose the best course of action in making a purchasing decision. Determine the value of different types of discounts, promotions, and offers ● Determine the value of different types of discounts, promotions, and offers ● Explain why it's important to sometimes keep your receipts ● Create a sample budget ● Categorize purchases into needs and wants ● Prioritize budget categories based on needs, wants, and savings goals
	2	Credit Saving Investing	Students will: ● Explain the concepts of credit, interest, and loans ● Explain how a person can use credit cards responsibly ● Explain how a loan's principal, interest rate, and term affect the overall cost of the loan ● Explain why saving is important ● Determine what spending habits they have that could change if necessary in order to meet savings goals ● Explain 'what is a savings account?' ● Explain the difference between saving and investing ● Discuss the basic elements of the stock market ● Explain how young people can start investing responsibly
	3	Protecting yourself Prepare for Success Life After School	Students will: ● Determine the most appropriate course of action in certain online situations ● Identify best practices to avoid identity theft ● Discuss the different types of scams that are used to target young people ● Identify soft skills that are a strength and those that are an area for improvement ● Explain what an elevator pitch is and why it is important ● Analyze popular interview questions ● Analyze the value of a college education ● Identify ways to lower the cost of college ● Choose an educational path for people who are pursuing a specific career
8	1	Behavioral Economics Banking	Students will: ● Practice making financial decisions ● Explore and experience a variety of cognitive biases. ● Explore steps someone can take to overcome cognitive bias ● Understand the variety of ways they can deposit and withdraw funds from their bank account ● Identify common bank account fees and how to avoid them ● Explain how overdraft protection works and the impact of overdraft fees ● List the pros and cons of digital wallets ● Explain how to bank safely online and explore the pros and cons of a cashless society

	2	Investing Types of credit	Students will: ● Explain what the stock market is and why companies and investors choose to participate in the stock market ● Experience why it can be difficult to predict trends in the stock market ● Explain what stocks are and how they can make money from investing in them ● Identify ways to minimize risk when investing in stocks ● Identify the major types of credit and their characteristics ● Explain how a credit card works in terms of making purchases and managing payments ● Describe how 'Buy Now, Pay Later' plans work ● Explain what a mortgage is and why most people require one to finance a home
	3	Managing Credit	Students will: ● Analyze the actions of someone who found themselves in problematic debt ● Assess multiple strategies to reduce or eliminate debt ● Summarize the content and purpose of a credit report ● Identify strategies to start building credit
9	1	Career Insurance	Students will: ● Differentiate between hard skills and soft skills ● Explain what a resume and cover letter are and how they are used in the hiring process ● Analyze best practices in interviewing ● Recognize common employer benefits ● Illustrate how everyone risks financial loss and how insurance shares that risk ● List factors that determine car insurance premiums ● Appreciate why it is valuable to have insurance, regardless of whether you own or rent a home ● Understand the importance of having health insurance
	2	Taxes Budgeting	Students will: ● Explain the difference between gross and net pay ● Identify key facts about taxes ● Explain the difference between gross and net pay ● Describe the difference between a flat and progressive tax rate ● Describe the purpose of a budget ● Explain how four different budgeting strategies work ● Weigh the pros and cons of each budgeting strategy ● Research and choose appropriate budgeting apps to meet specific needs
	3	Consumer Skills	Students will: ● Examine their role as a consumer and their consumer decisions ● Identify ways advertisements can influence their consumer decisions ● Identify different types of identity theft, how they can occur, and the impact they can have on someone's life ● Recommend what steps someone should take if they are scammed

Curriculum Pathway

Academic Year 2026-2027

Department: Business and Technology

Department Details	Assessment Types
Subject: KS3 Robotics **Head of Department: Ken Vitas Somvongsiri** **Head of Department Email: vitas.so@spip.in.th** **Subject Teacher(s): Joe O'Sullivan, Christian Makane**	**Assessment Type 1: Class Assessments** **Assessment Type 2: Worksheets** **Assessment Type 3: Projects**

Year	Term	Unit(s) of Work	Core Knowledge & Concepts
7	1	Scratch Programming	● Discovering block based programming ● Variables - assigning data ● Sequencing ● Taking User input ● Conditional Structures ● Subroutines ● Condition controlled iteration ● Algorithmic thinking - more advanced projects
	2	Cyber Pi	● Account set up and cyber pi connection - 'Hello World!' program ● Makeblock stage/sprite project - Similarities with scratch block programming ● Introducing cyber pi sensors - Mini programs - light sensor, microphone, gyroscope accelerometer ● Sound recorder - Using Cyber Pi's microphone ● Distance detection - Using Cyber Pi's ranging sensor ● Orientation detection - Cyber Pi's angle sensor ● Light saber project - Cyber Pi pocket shield and LED strip, gyroscope and accelerometer ● Electric gates - Cyber Pi's digital servo ports for object rotation control ● Motor lab demonstration - Using an electric motor with cyber Pi pocket shield and electric motor.
	3	Cyber Pi continued	● Oscillating fan - Using Cyber Pi's servo motor ● Smart trash can - Capitalizing on Cyber Pi's ranging sensor capability ● Autonomous vehicle - Ranging sensor controlled obstacle avoidance
8	1	Mblock and Mbot 2 projects	● Account setup and device connection - exploring Mblock ● Further exploration - Mbot sprite obstacle avoidance simulation ● Roaming vehicle - Vehicle construction for obstacle avoidance using Cyber Pi's ranging sensor ● Cyber Pi Oscillating fan project using cyber pi's servo motor to turn the fan ● Mblock navigate edge of surface simulation ● Navigate Physical Edge - analysis of a surface edge and creation of an Mbot edge navigation program ● Mblock obstacle avoidance simulation ● Physical obstacle avoidance - Using Mbot's ultrasonic sensor to implement an obstacle avoidance project on encountering the obstacle within a specific distance. ● Mblock maze simulation ● Ultrasonic maze - Using Mbot2's Ultrasonic sensor to navigate a maze. ● Mblock line follower simulation ● Line following - The use of Mbot's RGB quad sensor to cause the Mbot to follow a black line.

			● Night patrol project - Using cyber pi's ultrasonic sensor and light sensor in tandem to make the robot react to changes in ambient light intensity or on encountering an object within a specified distance.
	2	Teachable machine / Mbot: Integration	● Generate an AI object image recognition model and use this to trigger events ● Mbot 2 teachable machine program - Use teachable machine to produce an object recognition model which will enable Mbot 2 to react to different objects in its environment. ● Create an AI sound recognition model and use this to trigger a raise playground event. ● Mbot 2 teachable machine program - Use teachable machine to produce a sound recognition model which will enable Mbot 2 to react to different objects in its environment.
		Mbot2 and Python	● Obstacle avoidance program using Python to code the project ● LIne follower program using Python to code the project ● Navigate physical edge program using Python to code the project ● Maze navigation program using Python to code the project
	3	VEX VR robotics	● Art canvas - Plan on paper, then Move your robot to paint an art work ● Disk Maze in blocks - Planning, Sequencing, testing, debugging and optimization to navigate the disk maze playground. ● Disk maze in Python - use python to code the project ● Disk Mover in blocks - Task decomposition, computational and Algorithmic thinking in the navigation of the Disk moverVEX virtual reality playground ● Disk Mover in Python - use python to code the project. ● Disk Transport in blocks - Logical sequencing, spatial reasoning, systematic testing in the navigation of the disk transport VEX virtual reality playground. ● Disk transport in Python - use python to code the project
9	1	Vex VR	● Drive & Turn Challenge Move forward, backward, and turn at different angles. Goal: Navigate to a marked point. ● Drawing Shapes Use the Pen Tool to draw squares, triangles, or circles. Goal: Create basic geometric patterns. ● Obstacle Detection Use the Distance Sensor to stop before hitting a wall. Goal: Avoid all obstacles on the grid. ● Color Recognition Program the VR Robot to stop or turn when it sees a specific color. Goal: Follow a color-coded path. ● Coral Reef Cleanup Collect and deposit virtual trash. Goal: Achieve the highest cleanup score in limited time. ● Disk Mover Challenge Move disks to target zones using precise movements. Goal: Sort all disks correctly. Castle Crasher Knock over objects by pushing them. Goal: Clear the arena in the least number of moves. Repeat & Forever Loop Maze Use loops to continuously move through a maze. Goal: Reach the end with the shortest code.
	2	Vex VR and/or Vex IQ	● Pattern Creator Use nested loops to create star, spiral, or grid patterns. Goal: Make artistic designs using logic-based code. ● Coordinate Navigation Use the Location Sensor to move to exact (X, Y) positions. Goal: Visit all checkpoints in the shortest path. ● Autonomous Challenge Combine sensors, loops, and conditions to complete a task without manual intervention. Goal: Create a self-navigating program for a complex playground. ● Create Your Own Playground Game Design a scoring challenge or maze. Goal: Exchange and solve each other's games. ● Artistic Showcase Use Pen Drawing to make creative art or logos. Goal: Present unique patterns or designs. ● Build & Drive Assemble the standard Clawbot or BaseBot. Learn to drive forward, backward, and turn accurately. Goal: Navigate a taped path on the floor. ● Simple Arm Control Program the claw or arm to lift and lower objects. Goal: Pick up and place a small object in a marked zone.

	3	Complex Robotics Programming Robotics Communication and Control Exploring the Future of Robotics	● Bumper Switch Task Use bumper switches to stop the robot when it hits a wall. Goal: Drive until contact, then reverse or turn. ● Color Sensor Line Following Program the robot to follow a black line on a white surface. Goal: Reach the end of the line with minimal deviation. ● Distance Sensor Obstacle Avoidance Detect objects and steer around them. Goal: Move from start to finish without collisions. ● Precision Parking Challenge Use encoder values to drive specific distances and turn at set angles. Goal: Park the robot perfectly in a “garage” box. ● Shape Driving Program the robot to drive in a square, triangle, or figure-eight. Goal: Complete shapes accurately using loops. ● Object Transport Mission Move game elements from one area to another using the claw. Goal: Complete as many transfers as possible in 1 minute. ● Mini Tower Building Stack blocks or rings in a specific order. Goal: Build a stable structure using the robot’s arm. ● Autonomous Path Finder Combine multiple sensors to navigate a maze or course. Goal: Reach the endpoint without manual control. ● Custom Attachment Design Build a unique tool (plow, scoop, sweeper) to complete a special task. Goal: Demonstrate how attachments improve performance. ● Robot Sports Create a soccer, sumo, or tug-of-war challenge. Goal: Compete in teams using simple VEX IQ robots. ● Innovation Project Design a robot for a real-world purpose (e.g., recycling, delivery). Goal: Present and demo your solution.

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