National School Curriculum

INFORMATION & COMMUNICATION TECHNOLOGY CURRICULUM FRAMEWORK

FOR LEARNERS WITH VISION IMPAIRMENTS

Classes PP-XII

Department of School Education
Ministry of Education & Skills Development
Royal Government of Bhutan

“Your parents, relatives, and friends would be very proud of what you have achieved. At your age, to have completed your studies is your personal accomplishment. Your knowledge and capabilities are a great asset to the nation. I congratulate you on your achievements.

Finally, your capabilities and predisposition towards hard work will invariably shape the future of Bhutan. You must work with integrity, you must keep learning, keep working hard, and you must have the audacity to dream big.”

- His Majesty Jigme Khesar Namgyel Wangchuck

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Foreword

With evolving technology and development, children and youths are surrounded by multiple digital devices and digital media daily. The advent of technology benefited the people and the world in many fields including education. Learners and teachers including persons with vision impairments have access to multiple teaching and learning resources from the Internet and instantly get connected with professionals and experts across the world. Information and Communication Technology (ICT) provides a wide range of platforms for learners to develop 21st century skills and become global citizens. With such potential to transform education and enhance learners' competencies, there is a need to harness the power of modern technology to promote ICT education in Bhutan, and it is timely that the Department of School Education (DSE) reviewed the ICT curriculum framework for learners with vision impairments.

The revised ICT curriculum intends to equip learners from classes PP-XII with relevant knowledge, skills, and attitudes toward becoming productive, independent, and responsible citizens of the country and beyond. The curriculum, besides the technical component, also focuses on values to be cultivated through safe, ethical, and responsible use of technology for a positive and harmonious digital experience. In the general school curriculum, the majority of the contents focus on coding components. However, for learners with vision impairments, alternative topics have been suggested in the framework as learning coding has been found not accessible with screen readers. The curriculum is best delivered through a learner-centered approach and cross-curricular activities accentuating the development of key ICT competencies.

The successful implementation of the ICT curriculum, however, depends on the support schools receive in terms of adequate computers and reliable Internet connectivity. Besides, ICT teachers need to be trained on the pedagogy, content and assessment of the ICT curriculum and learners be given opportunities to participate in national and international level hackathons and ICT boot camps. For this, relevant agencies such as MoESD, BCSEA and DSE are engaged to provide support to teachers and schools regularly.

With this ICT curriculum framework in place, I look forward to creating, engaging and meaningful learning experiences that will help our learners to become competent, responsible, and productive citizens in the digital age.

Tashi Delek

(**Tashi Namgyal)**
Director, DSE
Ministry of Education & Skills Development

Contents

1. INTRODUCTION

ICT education in Bhutanese schools started modestly in the late 1980s with Gateway computers received under the Overseas Development Agency (ODA) funding. An attempt was then made to expose learners to basic mouse, keyboarding and word processing skills to the extent allowed by the limited hardware capability of Intel 286/386 computers.

In the nineties, powerful computers with better graphics capability facilitated the use of graphical-based software for various purposes. People started using computers at work as well as at home. Some schools also started offering Computer Science based on India's ICSE and ISC syllabus as an optional subject at classes IX to XII. The optional subject had a strong emphasis on programming.

A disparity was observed between the ICT skills taught in schools and skills required outside of schools. The demand within the country then was for ICT skills in office productivity applications rather than programming. To address this gap, a new ICT curriculum was developed and implemented in 2002 to equip learners with skills relevant to the world of work. This was a shift from an earlier programming-centric curriculum to office productivity applications.

Over the years, there has been exponential development and innovation in ICT. With the advent of the Fourth Industrial Revolution (or Industry 4.0), defined by cutting-edge technological breakthroughs such as artificial intelligence, cognitive computing, internet of things (IoT), blockchain technology, and a host of others, the way we work, learn and interact in the 21st century is evolving. This requires literacy with ICT in addition to conventional literacy of reading, writing and numeracy. ICT competencies will allow the learners to adapt and respond intelligently to evolving ideas, changing attitudes and emerging technologies in the knowledge economy. This curriculum framework is expected to address some of these critical needs by focusing on knowledge, skills and competencies essential to function in the knowledge society.

The ICT curriculum framework is also aligned with the draft National Education Policy and the Education ICT Master Plan (2019-2023), iSherig-2. The Policy mandates equipping learners with ICT skills and using it extensively to enhance teaching and learning. The iSherig-2 recommends equipping learners with "functional" and "foundational" ICT knowledge and skills to perform productively and responsibly in the knowledge society. Living in a knowledge society requires one to be a critical consumer of knowledge. ICT is part of the children's world today and it is relevant in developing different types of skills children need in their lives. In a move towards preparing our children to be adaptable, productive and responsible in the knowledge society, the curriculum framework is conceived with the view of what learners can do at the end of each class and key stage. While the theoretical foundation will always be an integral part of understanding the concepts and acquiring the skills, there is a strong emphasis on learner competencies - being able to perform and apply ICT knowledge and skills to new situations and contexts.

This curriculum framework is premised on competencies for each class and competency-based standards for each key stage that learners must master. The competencies are geared towards achieving the goals of ICT education through four connecting themes or strands. The four strands are technology operations, communication and collaboration, safety and ethics, and coding. Since the fourth strand of the mainstream ICT curriculum gives hurdles with screen readers, necessary accommodations and adaptations are made by adding alternative topics to make it inclusive. These strands run across all classes from PP to XII in varying extent and depth of coverage. The overall design and development of the

framework are guided and shaped by eight overarching principles, some impacting directly and others implicitly.

2. GOALS

As the tool for learning in the 21st century, ICT is not only the future of our children's education, it is the present, and we need to invest in ICT now (Lockhart, 2013). This investment in the ICT curriculum and the contents therein is aimed at achieving the following three goals.

Learners with vision impairments will:

- possess functional ICT knowledge and skills to perform productively and responsibly in a knowledge society.
- possess foundational knowledge and skills to pursue potential post-secondary educational and work opportunities in the field of ICT with the help of screen readers and accessible platforms designed for users with vision impairments.
- use ICT, assistive technology and devices to develop critical thinking and logical reasoning, and adaptability to emerging technologies.

3. KEY COMPETENCIES

In the fast-changing world of technology, learners should receive adequate opportunities to acquire ICT skills, knowledge and values towards becoming responsible and productive citizens with the confidence to harness the power of technology. Therefore, it is critical in school education to equip children with digital competencies required to access, evaluate, create and transfer knowledge effectively in a digital world.

Of the seven key competencies identified in the draft National School Curriculum Framework (NSCF), the ICT curriculum aligns predominantly towards “digital competence” due to the nature of the subject. However, other key competencies are taken care of through topical integration and strategies used in the content.

The ICT curriculum framework for learners with vision impairments identifies four key ICT competencies to develop and demonstrate at the end of school ICT education. These competencies align with the recent curriculum standards and frameworks from Programme for International Learner Assessment (PISA), Australian Curriculum, Assessment and Reporting Authority (ACARA), and International Society for Technology in Education (ISTE).

a. Accessing, evaluating and managing information

Learners have the ability to access resources and identify desired information from various sources using ICT. They evaluate the information by using currency, relevance and accuracy techniques, and store the information and various digital resources in an organised manner for easy retrieval or reuse in the future.

b. Collaborating and communicating information

Learners have the ability to use relevant ICT tools to collaborate with peers and others to complete common projects efficiently. They use ICT to exchange information, share knowledge, discuss issues, and customize media texts for a specific audience or context for effective communication.

c. Creating information and digital content

Learners have the ability to use ICT tools to adapt, modify and expand on the existing ICT-based data, information and digital content to enhance the message or produce a new understanding and knowledge.

They use ICT-based graphics and multimedia elements to simplify and enhance the communication of information for a specific audience.

d. Responsible use of ICT

Learners have the ability to use ICT appropriately and responsibly across multiple contexts and platforms for learning, exploring and creating digital contents. They consider both offline and online safety, security and ethical issues by using strong passwords, protecting personal information, installing antivirus, fighting cyberbullying, identifying fake news, using copyrighted materials, etc. They practise and advocate the importance of ethical and responsible use of ICT for positive and progressive digital citizens.

4. GUIDING PRINCIPLES

Guiding principles are the philosophical underpinnings which govern the development of a curriculum framework. The ICT curriculum should provide sound knowledge, skills, values and attitudes for our learners with vision impairments to excel in the digital world. The following guiding principles provide overall direction to the framework throughout its operation to align with the national ICT goals and global trends. It also informs teachers of the bigger picture of the subject and the philosophical ideas of delivering ICT education.

a. Gross National Happiness (GNH) values

With the global trend of growing interest in happiness, positive psychosocial and wellbeing, the four pillars and nine domains of Gross National Happiness (GNH) present areas that can help either in the selection of contents or development of learning experiences to facilitate awareness of GNH.

GNH as a guiding principle is useful to determine skills, values and attitudes relevant to living harmoniously and using technology responsibly in the digital society.

Technology is becoming an integral part of people's life, influencing the ways of working and thinking. Learners with vision impairments should be sensitized to how technology impacts the psycho-social wellbeing of people personally and globally. Some topics and outcomes relevant under this principle are to create awareness on cyber wellness, legal and ethical issues related to technology and e-waste.

b. 21st century skills

21st century skills such as personal and social responsibilities, critical thinking, digital competence, collaboration and communication abilities, and problem-solving are seen as valuable for people to contribute economically and socially, as leaders or as active participants, and as entrepreneurs in society. By providing accessible and inclusive learning platforms that build 21st century skills, learners with vision impairments are prepared to be active participants in an innovative and creative society. This demands digital competence which includes knowledge, understanding and creative use of ICT devices and tools.

21st century learning recognizes the importance of technology to access, research, organize, evaluate, create and communicate information successfully in a knowledge economy with a strong understanding of ethical and legal issues.

c. Effective pedagogy

In the 21st century classroom, learners need to engage actively in the complex and interconnected world to make meaning of what they learn. Teachers facilitate learner learning and create productive classroom environments, in which learners can develop the skills they might need at present or in future.

This demands the curriculum to focus on competency-based learning outcomes which would further necessitate emphasizing hands-on, authentic and self-directed learning activities.

d. Rationale for ICT in education

Rationales for ICT in education form an important basis to determine the purpose of the intended ICT curriculum. Hawkridge (as cited in UNESCO, 2012) provided the following six rationales which are still relevant today.

i. Social rationale: need to teach basic ICT skills to prepare learners for a place in society.
ii. Vocational rationale: role of ICT in giving learners appropriate skills for future jobs.
iii. Pedagogical rationale: enhancement of teaching and learning with the help of ICT.
iv. Catalytic rationale: using ICT to realize educational change or innovation.
v. Industry rationale: promotion of ICT industry in education.
vi. Cost-effective rationale: roles that ICT play in reducing costs for education.

e. Child development

Human development research indicates that there are universal, predictable sequences of growth and cognitive development of children and adolescents. These predictable changes occur in all domains of development – physical, emotional, social and cognitive.

Piaget identified four cognitive development stages: sensorimotor (birth-2 years), preoperational (2-7 years), concrete operational (7-11 years), and formal operational (adolescence - adulthood). In each stage, children demonstrate new intellectual abilities and an increasingly complex understanding of the world. Learning in young children is the result of interaction between the child's thoughts and experiences with materials, ideas, and people. Piaget asserts that "these experiences should match the child's developing abilities, while also challenging the child's interest and understanding. ICT in education is useful for the rich context it provides for the activity of children and resulting cognitive development. This requires careful consideration of the level and complexity of the curriculum to align with the development stages.

f. Learning styles

Theory of Multiple Intelligences (Gardener, H; 1983) states that each person has different ways of learning and different bits of intelligence. Some learn by engaging in reading and writing, some learn through mathematical logic and others learn by working with their hands. Each person possesses a certain degree of these bits of intelligence, but there is always a primary or more dominant intelligence.
To the extent possible depending on the nature of the topic, the curriculum should provide opportunities for learners to learn in a variety of ways. This allows each learner to learn with his or her strengths and work to improve weaknesses to realize his or her full potential.

g. Lifelong learning

Lifelong learning is based on the principle that learning is a continuous process that occurs throughout one's life. It is a voluntary and self-motivated pursuit of knowledge for either personal or professional reasons. It can take place in formal education, non-formal and informal education and beyond.

With the rapid development in the field of ICTs such as Web 3.0 and virtual world technologies, rich resources of educational study materials are now at our fingertips. Learners can now complement and supplement their learning through online resources, office-goers and hobbyists can enhance their knowledge and skills or learn new skills to become more productive in their work-life or their areas of interest.

ICT can provide a rich context for communication, collaboration and positive learning experiences to help learners fully develop their natural abilities, open mind and create curiosity for new learning, adapt to change, increase wisdom and make the world a better place.

h. ICT across the curricula

Globally, educational systems are integrating ICT in the teaching and learning process, not only to improve subject learning, but also to provide with technological skills that would enable them to cope with 21st century challenges. Kainth and Kaur (as cited in Essays, 2018) describe ICT integration "as the usage of technology seamlessly for educational processes like transacting curricular content and learners working on technology to do authentic tasks".

ICT, as an interdisciplinary domain, is transforming the curriculum and the learning activities that promote higher-order thinking skills, which require the use of digital tools and online resources. This transformation in learners' learning and their learning environment requires ICT competence which is best developed by providing learners with meaningful learning experiences, embedded in purposeful subject-related contexts.

5. CURRICULUM STRUCTURE AND ORGANIZATION

ICT curriculum is organised into strands, key stage-wise competency-based standards, class-wise competencies and objectives to provide a clear outline of what learning standards, competencies, and core concepts are expected of learners to achieve at the end of each key stage and class level. These standards and competencies in all classes are grouped into broad thematic areas called strands.

5.1 STRANDS

The learning standards and competencies in this framework are organised by broad themes termed as strands. The term 'strands' is used to indicate "domains that group the related general and specific learning outcomes or achievement aims and objectives within a particular learning area or discipline" (UNESCO, 2016). Strands show a logical flow of learning, starting from the technology operations and concepts to computational thinking.

Three connecting strands run across all classes from PP to XII in varying extent and depth of coverage as follows:

Strand A: Technology Operations
Strand B: Communication and Collaboration
Strand C: Safety and Ethics

A. Technology operations

The Technology Operations strand broadens the learners' understanding of computers as a system and the basic principles on which computers work. Learners become familiar with the concepts and elements of modern computers, devices and networks. They recognize common, similar features and functions in digital environments and independently apply those to new technology experiences. With this strand, learners are also exposed to efficient operations of technology and management of their products using screen readers and windows narrators.

B. Communication and collaboration

The Communication and Collaboration strand prepares learners to work together to create innovative solutions to real-world problems and communicate their solutions with others. As they carry out their investigations and projects, they must access, analyse, and use the information they need to complete the learning tasks. While working through the task, learners build important life and career skills by learning to manage their time, to become self-directed learners and to collaborate effectively with others. Using appropriate technology tools such as smart phones and smart technological devices to complete their task, learners discover the most effective and efficient ways to access and manage the world of digital information that is available.

C. Safety and ethics

The Safety and Ethics strand encourages learners to become responsible digital citizens. Digital citizenship relates to the responsible, ethical and safe use of ICT by learners as a member of connected global 21st century society (Manitoba, 2012). This strand prepares the learners to evaluate the various positive and negative impacts of computers on society and demonstrate the understanding of ethical, cultural and societal issues related to technology. They practice responsible use of technology systems and information; and develop positive attitudes towards technology uses that support lifelong learning (International Society for Technology in Education, 2016).

5.2 KEY STAGES

The learning standards and competencies for all class levels are categorised into five key stages to represent cohorts of learners as informed by their generic developmental stages. Each key stage outlines competencies, standards and core concepts that are aligned to the four strands, and are expected to be achieved by learners at the end of the key stage. The five key stages for different classes are as follows:

Key Stage	Class Range
I	PP to III
II	IV to VI
III	VII to VIII
IV	IX to X
V	XI to XII

5.3 KEY STAGE-WISE COMPETENCY-BASED STANDARDS

Key Stage	Competency-based Standards
I	1. Explore basic components of a computer and its purposes in the working of the computer. 2. Use screen readers to perform basic computer operations in performing simple tasks while ensuring the safe and proper care of the machine 3. Perform touch typing of home row keys to recognise and locate ASDFGHJKL; letters with proper finger positioning. 4. Type alphabets and basic words in a word processor to practice keyboarding skills. 5. Explore computers to listen/watch educational online songs, rhymes, videos to improve listening skills. 6. Demonstrate proper behaviour by following the computer laboratory rules while using computers for safe and conducive learning. 7. Use screen readers to navigate the Windows Operating System for performing simple tasks. 8. Navigate the File Explorer to efficiently search for files and folders stored in a computer system. 9. Perform touch typing of top row keys and home row keys to efficiently type basic words 10. Type basic words in a word processor to practice keyboarding skills. 11. Explore computers to listen/watch educational online songs, rhymes, videos to improve listening skills. 12. Care for computers by practicing proper handling of computers and its devices to reduce maintenance. 13. Classify computer peripherals into input and output devices to understand the functioning of a computer system. 14. Perform touch typing of bottom row, top row, and home row keys to type basic words. 15. Create a document using word processors to practice typing skills and convert individual works into digital format. 16. Manage files by creating/deleting, naming/renaming and saving on the computer desktop to organize individual works. 17. Navigate files and folders in the Windows operating system for performing tasks. 18. Perform basic navigation in the smartphones to do simple tasks. 19. Exhibit healthy behaviour while using computers by reducing screen time to prevent repetitive strain injury. 20. Identify different storage devices to understand the saving of files and programs in the computer system. 21. Use screen readers to navigate the web browser and Windows Operating System to perform tasks. 22. Perform touch typing of letter and number keys to type basic words, numbers and sentences. 23. Create a simple Dzongkha document using a word processor to promote the Dzongkha language.

	24. Manage folders by creating relevant folders within a folder for organization of files and applications. 25. Search resources on concepts learned in other subjects using the Internet to enhance self-exploration skills and deeper learning. 26. Use smartphones and other devices to enhance literacy skills by listening to audiobooks from internet sources. 27. Exhibit healthy behaviour while using computers by following correct body posture to prevent repetitive strain injury.
II	1. Demonstrate keyboarding skills by typing letters, words and simple sentences using an online typing tutor and word processor. 2. Describe basic hardware components in a computer system based on their functions to understand the working of a computer. 3. Apply character formatting tools in a word processing document to improve the presentation of texts. 4. Gather relevant information from the Internet to explore and appreciate how technology has positively changed our lives. 5. Use smartphones to access global and national news to stay informed and updated on current trends and technologies. 6. Create multiple copies of important data or resources in both computers and smartphones to keep data backup in case of unexpected data loss or disruption. 7. Identify the sources of global and national news gathered from online sites to acknowledge the ownership. 8. Demonstrate keyboarding skills by typing letters, numbers, words and sentences in typing tutor and word processor to type accurately and efficiently for reducing typo 9. Apply paragraph formatting tools in a word processing document to improve the presentation and flow of paragraphs. 10. Identify common software used in a computer system based on their functions to understand the working of a computer. 11. Use the computers/smartphones to identify online learning platforms/sites and tutorials to foster independent exploration and learning. 12. Practice appropriate data backup and malware prevention strategies for data security. 13. Validate the sources of information or resources gathered from online sites to acknowledge ownership. 14. Showcase keyboarding skills by typing letters, words, numbers, sentences and paragraphs using a typing tutor and word processor with no typo. 15. Apply table formatting and page formatting tools in a word processing document to improve the presentation and organization of information. 16. Describe the purpose of different software or applications that are commonly used in day-to-day activities 17. Maintain a list of relevant online sites, resources, and tutorials by using bookmark features in browsers for easy access to the resources. 18. Use emails to communicate and share information with others for collaboration and timely dissemination of information.

	19. Use smartphones to research and explore the content learned in other subjects for additional learning. 20. Use strong passwords for computer/mobile devices or individual online accounts by following a set of criteria to keep personal data safe and secure. 21. Exhibit good practices of validating online resources/information by following evaluation criteria to avoid false information and irrelevant materials.
III	1. Create a simple PowerPoint presentation /Google slide using presentation tools on any topic to communicate ideas. 2. Convert Word files, PowerPoint files, webpages and PDF files interchangeably using online or offline tools to complete tasks that require file conversion. 3. Use audio editing tools to record and edit to produce audio materials for sharing and expressing creativity. 4. Use the Internet on computer/smartphone to research and explore the content learned in other subjects. 5. Use a computer/smartphone to access social media platforms for communication with peers and family. 6. Use the email attachment feature to send and receive relevant documents and files for effective information sharing and collaboration. 7. Apply data safety and security measures with ethical behavior while using social media platforms. 8. Maintain a positive digital identity while using social media to exhibit responsible use of online communication platforms. 9. Convert any files to different formats using online or offline tools for accessibility and compatibility across a range of platforms and devices. 10. Create a PowerPoint presentation/google slides on a relevant topic by using presentation tools to share ideas and communicate information effectively. 11. Create video contents using video editing tools to communicate information and ideas. 12. Create a personal blog using an online blogging platform to convey messages and ideas to a wider audience. 13. Use the Internet on computer/smart phones to research and explore the content learned in STEM subjects for additional learning. 14. Participate in social networking groups to share or gather information from relevant learning communities. 15. Use online Government to Citizen (G2C) services by accessing the G2C portal to avail the services and appreciate the government's initiative to foster effective public service delivery. 16. Mitigate the issue of online data security and privacy after identifying common areas where data security and privacy are compromised. 17. Maintain a positive digital identity while participating in social media groups and communities to exhibit responsible use of technology.

IV	1. Use spreadsheet to navigate, enter data, format and perform basic mathematical functions for organization of relevant dataset. 2. Perform installation and uninstallation of software/application in computer/smartphone/tablet to assist in solving accessibility problems. 3. Use Google Drive to store and organise personal files and resources for easy access and reference. 4. Maintain a blog and vlog using an online blogging platform to share information on relevant topics. 5. Use smartphones to participate in social networking groups to share or gather information from relevant learning communities. 6. Create awareness on the negative impacts of fake news, cyberbullying, and fake accounts to inform others in creating safe online experiences. 7. Perform basic data analysis using common functions in a spreadsheet to make relevant data interpretation. 8. Troubleshoot common computer issues by applying relevant solutions to resolve problems independently. 9. Use Google workspace to store and share common files and resources to facilitate online collaboration among teams. 10. Use smartphones/tablets to research on topics learned in other subjects to deepen the understanding of the concepts 11. Create awareness on the negative impacts of plagiarism and online scam to inform others in creating a safe online experience. 12. Evaluate different types of media messages to make an informed judgement as consumers of information and media.
V	1. Explore different types of music production software that are accessible with the screen readers to create music. 2. Use different types of assistive technologies and devices for pursuing education and independent living. 3. Use Google Docs to create and edit common text-based documents in collaboration with peers. 4. Participate in video conferencing webinars or presentations to communicate and share information with others. 5. Engage in Professional Learning Communities (PLCs) to exchange information, experiences, and insights with peers to expand one's knowledge base. 6. Enrol in Massive Open Online Courses (MOOC) to achieve educational goals, including completing courses and earning certificates. 7. Exhibit responsible use of technology in alignment with the media policy of Bhutan. 8. Use music production software to unleash creative expression in composing original music. 9. Use a range of assistive technologies and devices for pursuing education and independent living. 10. Use Google Sheets and Google Slides to communicate and share information with others for collaboration and timely dissemination of information.

	11. Host video conferencing events to communicate and share information with others for collaboration and timely dissemination of information. 12. Participate in Professional Learning Communities (PLC) activities, discussions, and initiatives to contribute to a vibrant and thriving professional community. 13. Complete selective MOOC courses to continuously seek out new knowledge in a dynamically evolving educational environment. 14. Evaluate the benefits and limitations of ICT in society to make informed decisions that leverage technology for the positive development of individuals and communities. 15. Advocate on the safe and ethical use of technology and social media to promote responsible digital users.

5.4 CLASS-WISE COMPETENCIES

Class	Competencies
PP	Learners will be able to: 1. Explore basic components of a computer and its purposes in the working of the computer. 2. Use screen readers to perform basic computer operations in performing simple tasks while ensuring the safe and proper care of the machine 3. Perform touch typing of home row keys to recognise and locate ASDFGHJKL; letters with proper finger positioning. 4. Type alphabets and basic words in a word processor to practice keyboarding skills. 5. Explore computers to listen/watch educational online songs, rhymes, videos to improve listening skills. 6. Demonstrate proper behaviour by following the computer laboratory rules while using computers for safe and conducive learning.
I	Learners will be able to: 1. Use screen readers to navigate the Windows Operating System for performing simple tasks. 2. Navigate the File Explorer to efficiently search for files and folders stored in a computer system. 3. Perform touch typing of top row keys and home row keys to efficiently type basic words 4. Type basic words in a word processor to practice keyboarding skills. 5. Explore computers to listen/watch educational online songs, rhymes, videos to improve listening skills. 6. Care for computers by practicing proper handling of computers and its devices to reduce maintenance.
II	Learners will be able to: 28. Classify computer peripherals into input and output devices to understand the functioning of a computer system. 29. Perform touch typing of bottom row, top row, and home row keys to type basic words. 30. Create a document using word processors to practice typing skills and convert individual works into digital format. 31. Manage files by creating/deleting, naming/renaming and saving on the computer desktop to organize individual works. 32. Navigate files and folders in the Windows operating system for performing tasks. 33. Perform basic navigation in the smartphones to do simple tasks. 34. Exhibit healthy behaviour while using computers by reducing screen time to prevent repetitive strain injury.

III	Learners will be able to: 1. Identify different storage devices to understand the saving of files and programs in the computer system. 2. Use screen readers to navigate the web browser and Windows Operating System to perform tasks. 3. Perform touch typing of letter and number keys to type basic words, numbers and sentences. 4. Create a simple Dzongkha document using a word processor to promote the Dzongkha language. 5. Manage folders by creating relevant folders within a folder for organization of files and applications. 6. Search resources on concepts learned in other subjects using the Internet to enhance self-exploration skills and deeper learning. 7. Use smartphones and other devices to enhance literacy skills by listening to audiobooks from internet sources. 8. Exhibit healthy behaviour while using computers by following correct body posture to prevent repetitive strain injury.
IV	Learners will be able to: 1. Demonstrate keyboarding skills by typing letters, words and simple sentences using an online typing tutor and word processor. 2. Describe basic hardware components in a computer system based on their functions to understand the working of a computer. 3. Apply character formatting tools in a word processing document to improve the presentation of texts. 4. Gather relevant information from the Internet to explore and appreciate how technology has positively changed our lives. 5. Use smartphones to access global and national news to stay informed and updated on current trends and technologies. 6. Create multiple copies of important data or resources in both computers and smartphones to keep data backup in case of unexpected data loss or disruption. 7. Identify the sources of global and national news gathered from online sites to acknowledge the ownership.
V	Learners will be able to: 1. Demonstrate keyboarding skills by typing letters, numbers, words and sentences in typing tutor and word processor to type accurately and efficiently for reducing typo 2. Apply paragraph formatting tools in a word processing document to improve the presentation and flow of paragraphs. 3. Identify common software used in a computer system based on their functions to understand the working of a computer. 4. Use the computers/smartphones to identify online learning platforms/sites and tutorials to foster independent exploration and learning. 5. Practice appropriate data backup and malware prevention strategies for data security. 6. Validate the sources of information or resources gathered from online sites to acknowledge ownership.

VI	Learners will be able to: 1. Showcase keyboarding skills by typing letters, words, numbers, sentences and paragraphs using a typing tutor and word processor with no typo. 2. Apply table formatting and page formatting tools in a word processing document to improve the presentation and organization of information. 3. Describe the purpose of different software or applications that are commonly used in day-to-day activities 4. Maintain a list of relevant online sites, resources, and tutorials by using bookmark features in browsers for easy access to the resources. 5. Use emails to communicate and share information with others for collaboration and timely dissemination of information. 6. Use smartphones to research and explore the content learned in other subjects for additional learning. 7. Use strong passwords for computer/mobile devices or individual online accounts by following a set of criteria to keep personal data safe and secure. 8. Exhibit good practices of validating online resources/information by following evaluation criteria to avoid false information and irrelevant materials.
VII	Learners will be able to: 1. Create a simple PowerPoint presentation /Google slide using presentation tools on any topic to communicate ideas. 2. Convert Word files, PowerPoint files, webpages and PDF files interchangeably using online or offline tools to complete tasks that require file conversion. 3. Use audio editing tools to record and edit to produce audio materials for sharing and expressing creativity. 4. Use the Internet on computer/smartphone to research and explore the content learned in other subjects. 5. Use a computer/smartphone to access social media platforms for communication with peers and family. 6. Use the email attachment feature to send and receive relevant documents and files for effective information sharing and collaboration. 7. Apply data safety and security measures with ethical behavior while using social media platforms. 8. Maintain a positive digital identity while using social media to exhibit responsible use of online communication platforms.
VIII	Learners will be able to: 1. Convert any files to different formats using online or offline tools for accessibility and compatibility across a range of platforms and devices. 2. Create a PowerPoint presentation/google slides on a relevant topic by using presentation tools to share ideas and communicate information effectively. 3. Create video contents using video editing tools to communicate information and ideas. 4. Create a personal blog using an online blogging platform to convey messages and ideas to a wider audience. 5. Use the Internet on computer/smart phones to research and explore the content learned in STEM subjects for additional learning.

	6. Participate in social networking groups to share or gather information from relevant learning communities. 7. Use online Government to Citizen (G2C) services by accessing the G2C portal to avail the services and appreciate the government's initiative to foster effective public service delivery. 8. Mitigate the issue of online data security and privacy after identifying common areas where data security and privacy are compromised. 9. Maintain a positive digital identity while participating in social media groups and communities to exhibit responsible use of technology.
IX	Learners will be able to: 1. Use spreadsheet to navigate, enter data, format and perform basic mathematical functions for organization of relevant dataset. 2. Perform installation and uninstallation of software/application in computer/smartphone/tablet to assist in solving accessibility problems. 3. Use Google Drive to store and organise personal files and resources for easy access and reference. 4. Maintain a blog and vlog using an online blogging platform to share information on relevant topics. 5. Use smartphones to participate in social networking groups to share or gather information from relevant learning communities. 6. Create awareness on the negative impacts of fake news, cyberbullying, and fake accounts to inform others in creating safe online experiences.
X	Learners will be able to: 1. Perform basic data analysis using common functions in a spreadsheet to make relevant data interpretation. 2. Troubleshoot common computer issues by applying relevant solutions to resolve problems independently. 3. Use Google workspace to store and share common files and resources to facilitate online collaboration among teams. 4. Use smartphones/tablets to research on topics learned in other subjects to deepen the understanding of the concepts 5. Create awareness on the negative impacts of plagiarism and online scam to inform others in creating a safe online experience. 6. Evaluate different types of media messages to make an informed judgement as consumers of information and media.
XI	Learners will be able to: 1. Explore different types of music production software that are accessible with the screen readers to create music. 2. Use different types of assistive technologies and devices for pursuing education and independent living. 3. Use Google Docs to create and edit common text-based documents in collaboration with peers. 4. Participate in video conferencing webinars or presentations to communicate and share information with others. 5. Engage in Professional Learning Communities (PLCs) to exchange information, experiences, and insights with peers to expand one's knowledge base.

	6. Enrol in Massive Open Online Courses (MOOC) to achieve educational goals, including completing courses and earning certificates. 7. Exhibit responsible use of technology in alignment with the media policy of Bhutan.
XII	Learners will be able to: 1. Use music production software to unleash creative expression in composing original music. 2. Use a range of assistive technologies and devices for pursuing education and independent living. 3. Use Google Sheets and Google Slides to communicate and share information with others for collaboration and timely dissemination of information. 4. Host video conferencing events to communicate and share information with others for collaboration and timely dissemination of information. 5. Participate in Professional Learning Communities (PLC) activities, discussions, and initiatives to contribute to a vibrant and thriving professional community. 6. Complete selective MOOC courses to continuously seek out new knowledge in a dynamically evolving educational environment. 7. Evaluate the benefits and limitations of ICT in society to make informed decisions that leverage technology for the positive development of individuals and communities. 8. Advocate on the safe and ethical use of technology and social media to promote responsible digital users.

5.5 LEARNING OBJECTIVES

CLASS PP		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**
• Explain computers in their own words. • Identify basic computer components. • Name at least two examples of computers.	**Introduction to Computers** • Definition of computer • Examples of computer • Computer components and their purpose (Mouse, Monitor, Keyboard, CPU)	Observing and identifying
• Name different screen readers. • Explain screen readers in their own words. • Follow correct steps to start and shut down computers. • Tell the benefits of shutting down computers properly in their own words. • Use keyboard help-on to perform random typing using Screen Reader.	**Screen Readers** • Introduction to screen readers • Types of screen readers (E. g: Windows Narrator, JAWS and NVDA) **Operating a Computer** • Turning on a Computer • Shutting down a Computer • Advantages of following proper procedure of shutting down computers	Operating and identifying, exploring, collaborating

	• Disadvantages of not following proper procedure of shutting down computers • Random typing using Keyboard help on ***Hotkeys*** *Keyboard help-on or off (INSERT + 1) in JAWS/NVDA*	
• State the importance of typing. • Name the letters on the home row keys. • Locate home row keys on a keyboard. • Apply touch typing skills to type random home row keys with keyboard help-on.	**Keyboard layout** • Keyboard orientation • Home row keys (ASDFGHJKL;) • Finger position • Importance of learning typing	Operating, analysing and identifying
• Explain MS Word in their own words. • Type simple words using the home row keys. • Practice typing skills through activities to improve typing speed. • Explain the benefits of using Microsoft Word application.	**Home Row keys** • Introduction to MS Word • Beginning with ASDFGHJKL; (Keyboard help) • Type basic words (SAD, HAD, DAD, ASK, SAG, ADD) • Benefits of using MS Word	Exploring, and creating
• Listen/watch online educational songs, rhymes and videos. • Sing along with the rhymes and songs played on a computer.	**Listening to online Audio/videos:** • Online educational songs, rhymes and videos (teacher guided)	Operating, comprehending, and practising
• Explain the importance of computer laboratory rules in promoting safety and conducive learning. • Follow the basic laboratory rules to care for the computer. • Tell the potential consequences of not adhering to computer laboratory rules. • Practice using computer equipment and software safely and responsibly.	**Laboratory rules** • Computer laboratory rules • Importance of computer laboratory rule • Taking care of the computers (Protective Cover, keyboard dusting, Provide Sufficient Airflow) • Risk of not following the rules	Remembering, practising

CLASS I		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**
• Identify common screen readers used in windows operating systems. • Use hotkeys to minimize, maximize or close a window. • Use arrow keys on the keyboard to navigate File Explorer in Windows operating system. • Explain the importance of hotkeys to navigate File Explorer.	**Screen Readers** • Types of Screen readers (JAWS and NVDA) **Hotkeys** • Minimize window (Windows + M) • Maximize window (Windows + Shift + M) • Close window (Alt + F4) • File Explorer (Windows + E)	Observing, identifying, and comprehending
• Explain the function of File Explorer in the Windows operating system. • Define basic window operations such as minimize, maximize, and close buttons in their own words. • Perform basic operations on a window such as closing, minimizing, and maximizing. • Explain the functions of minimize, maximize, and close buttons. • Navigate from one window to another to search files, folders and applications. • Search files and folders available in different locations of the computer.	**File Explorer** • Definition & function **Hotkeys (JAWS)** • Open File Explorer (Windows + E) • Back (ALT + LEFT ARROW) • Forward (ALT + RIGHT ARROW) • Minimize window (Windows + M) • Maximize window (Windows + Shift + M) • Close window (Alt + F4) • Switch windows (ALT + Tab)	Operating, exploring, and identifying
• Name the letters on the top row keys. • Identify the top row keys on a keyboard. • Construct simple sentences using words from the top row keys. • Apply touch typing skills to efficiently type basic words.	**Keyboard Layout** • The QWERTY keyboard layout and the position of the top row keys (QWERTYUIOP) • Finger Placement and Hand Position • Example of basic words (TIP, TOP, PUT, POT, TOY, ROW, TOUR, PORT, ROPE, QUITE,	Exploring, identifying and creating

	WERE, YOUR, YOU, OUR, GOOD, GOD, KEEP)	
● Open MS Word document in a computer system. ● Type words in MS Word using top and home row keys accurately. ● Save the word documents in My Documents. ● List down a few words formed by combination of Home row and Top row keys. ● Explain the benefit of using MS Word to practice typing skill.	**Microsoft Word** ● Opening MS Word ● Typing alphabets (ASDFGHJKL and QWERTYUIOP) ● Typing words using top and home row keys (THE, YOU, PUT, HOUSE, WATER, AIR, EYES, EAR, ROOT, UP, LEFT, RIGHT) ● Type short sentences **Hotkeys** ● Save MS Word document (CTRL + S)	Operating, exploring, and creating
● Play online educational songs, rhymes and videos on a computer. ● Sing along with the rhymes and songs played on a computer.	**Listening to online Audio/videos:** ● Online educational songs, rhymes and videos (teacher guided)	organising, and operating
● Tell different ways to handle the computers and digital devices properly. ● Manage cables and cords to prevent jumbling and wear. ● Follow ways to take care of personal computers. ● Explain the benefits of taking care of computers both at home and school. ● Demonstrate a sense of responsibility and ownership toward shared classroom computers, respecting others' turns and handling devices responsibly.	**Computer Care** ● Ways to take care of computers at school and home ● Basic Cable Management ● Computer Care ● Benefits of computer care ● Sense of Computer Ownership	Accessing, searching, comprehending and exploring

CLASS II		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**
• Identify various input and output devices. • Distinguish between input and output devices with examples. • Categorize computer peripheral devices available in the school or home based on its functions. • Explain the importance of input and output devices.	**Input and Output device** • Introduction to Computer Devices (Input and Output Devices: monitors, printers, speakers, and projectors, mouse, keyboard, microphone) • Definition of input and output devices • Functions of input and output devices • Importance of input and output devices	Operating and exploring, comprehending
• Name the letters on the bottom row keys. • Locate the bottom row keys on a keyboard. • Identify modifier keys on a keyboard. • Explain the functions of the modifier keyboard keys.	**Bottom row keys** • Keys (ZXCVBNM, . /) • Practice keys (XNV, MNV, ZNX, MVB, CZX, BBC, CCN, etc.) • Functions of modifier keys (Enter, Spacebar, Shift, Ctrl, Fn, Windows, Alt, Caps Lock).	Exploring, designing, and creating
• Type sentences and paragraphs accurately and efficiently in the word processor. • Create a simple Word document on topics or concepts learned in English or Mathematics subjects. • Apply text alignment such as Left, Center, Right and Justify for enhanced document layout. • Save the Word document on the computer.	**Document in MS Word** • Typing sentences • Typing paragraphs (Keyboard keys: enter, spacebar, shift, caps lock, full stop) • Creating Word Document **Document in MS Word** • Typing words and Names • Simple words (CAR, VERY, BED, NOSE, MOUTH, ZOO, FOX, BOLD, MONDAY, INSIDE, AWAY, LOVE, etc.) • Typing simple sentences **Hotkeys** • Left align (CTRL + L) • Center Align (CTRL + E) • Right Align (CTRL + R) • Justify (CTRL + J)	Exploring, typing, formatting, and creating

• Explain the concept of files and folders on a computer. • Create files and folders on the desktop. • Rename the existing files and folders with appropriate names. • Delete files and folders. • Save document files in a folder. • Tell the importance of naming files and folders to improve organization.	**File and Folder Management** • File operation (Create, Open, Rename, Save, Delete, etc.) • Folder Management • Importance of naming a file **Hotkeys** • Create folder (CTRL + SHIFT + N) • Select folder (CTRL + SPACEBAR) • Paste folder (CTRL + V) • Rename file and folder (F2) • Delete folder (CTRL + D)	Accessing, searching, and exploring

• Navigate files and folders on the desktop using arrow keys.
• Perform various actions on folders, including copying, deleting, and pasting.
• Use commands to browse and open files and folders in different locations.
	Files and Folder Management
	• Computer Desktop
	• Managing folders (copy, paste and delete)
	
	Hotkeys
	• Select and copy folder
	  o Select a file or Folder (CTRL + SPACEBAR)
	  o Copy a file or folder (CTRL + C)
		Accessing, and exploring

• Differentiate between desktop and smartphones. • Follow the correct steps to switch on and switch off smartphones. • Use smartphone screen readers to access the phone. • Navigate the home screen of a smartphone to access essential features. • Explain the basic layout and icons on the smartphone screen. • Use smartphones to talk with others. • Check the date and time using smartphones. • Play preloaded songs or audio files on the smartphone. • Explain the importance of smartphone screen readers.	Smartphones • Switch on a smartphones • Smartphone screen readers • Examples of smartphone screen readers (TalkBack and VoiceOver) **Hardware Components** • The screen, buttons, camera, battery, and ports Smartphone **navigation and accessories** • Home screens, app icons, and settings menus • Communication Features: Making and receiving calls • Multimedia and Entertainment: Playing audio and video content • Accessing the Clock App • Navigating the Music App	Evaluating, reflecting, analysing and applying

• Tell about repetitive strain injury (RSI) with examples. • Identify various factors contributing to RSI. • Demonstrate good practices of preventing RSI. • Talk about the benefits and risks of using headphones/earphones. • List the benefits of maintaining a balanced screen time. • Share ways to maintain a balanced screen time.	**Repetitive strain injury** • Define RSI with examples • Factors contributing to RSI • Signs and symptoms: wrist pain, eye strain, neck pain, and back discomfort, and understand the importance of early detection **Way to prevent RSI** • Proper ergonomics • Balanced screen time	Observing, comprehending and adopting

CLASS III		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**
• Define storage devices in their own words. • Name common storage devices used in computers. • Describe the functions of different storage devices. • Identify common internal storage and external storage devices in a computer system. • State the importance of saving files and programs in the storage devices.	**Storage devices** • Definition of storage devices • Examples (USB Flash Drive, External Hard drive, SD card) • Functions of storage devices • Benefits of storage devices	Observing, identifying, and comprehending
• Use screen readers to open and navigate the web browsers. • Use hotkeys to minimize, maximize, and close a browser window. • Use screen readers to navigate windows operating systems. • Recognise the benefits of using screen readers and hotkeys to navigate web browsers.	**Basic Browser Navigation** • Use Screen reader **Hotkeys** • Back (ALT + LEFT ARROW) • Forward (ALT + RIGHT ARROW) • Switch windows (ALT+TAB) • Open new browser tab(CTRL + T) • Switch browser tabs (CTRL+TAB) • Close current tab (CTRL + W) • Close All tabs (ALT + F4) • Minimize (WINDOWS + M) • Maximize (WINDOWS + SHIFT + M)	Exploring, and

• Define a typing tutor in simple terms. • Locate letter and number keys on a keyboard. • Apply correct finger positions on the keyboard to practice typing using both online and offline typing tutors. • Use an online or offline typing tutor such as www.typing.com (enable dictation mode) to improve typing skills. • Type basic words and simple sentences. • Discuss the benefits of using a typing tutor.	**Keyboard** • Typing alphabet • Typing numbers • Typing words and sentences • Benefits of keyboarding • Keyboard layout **Typing Tutor** • Definition of typing tutor • Example of online or offline typing tutor (www.typing.com, TypeAbility, Talking Typing Teacher, and other.) • Advantages of using a typing tutor	Operating, typing, and practising
• Switch the keyboard layout from English to Dzongkha using hotkeys. • Locate dzongkha alphabets and vowels on the keyboard. • Apply correct finger positions on the keyboard to practice typing Dzongkha letters. • Type basic Dzongkha words in a MS Word document. • Explain the importance of typing in Dzongkha in relation to promoting the Dzongkha language.	**Setting up Dzongkha Keyboard** • Introduction to Dzongkha Keys • Introduction to Vowel keys(◌ི་ ◌ུ ◌ེ ◌ོ) **Typing in Dzongkha** • Dzongkha fonts, keyboard layout & language setting • Practice Dzongkha typing • Typing Dzongkha words (ཁབ་ བཀག་ དཀའ་ བསྒོ་ མིང་ ཆུ་) **Hotkeys** • Switch keyboard layout (SHIFT + ALT) or (WIN + SPACEBAR)	Accessing, searching, analysing and exploring
• Explain the concept of folders and subfolders on a computer. • Create new folders within existing folders, using appropriate names. • Categorize folders based on content, purpose, or projects. • Move files and folders from one location to another. • Restore the files or folders from the Recycle Bin. • Share the importance of organizing files and	**Files and Folder Managemen**t • Creating folders and sub folders • Categorize folders **Managing folders** • Create subfolders, rename, delete, move files and folders • Restore files or folder from Recycle Bin • Importance of organizing files and folders within folders **Hotkeys**	Accessing, organizing, exploring, comprehending and applying

applications within a structured folder system.	• Create Folder (CTRL + SHIFT + N) • Rename (F2) • Delete (CTRL + D) • Instantly restore deleted files or folder (CTRL + Z) • Move (CTRL + X) • Paste (CTRL + V)	
• Define a web browser in their own words. • List commonly used web browsers. • Use web browsers to explore educational websites to gather information on topics learned in other subjects. • Search different resources in the form of text, audio, and video from the Internet. • Explain the importance of using a web browser to learn more about topics studied in different subjects.	**Web browser** • Definition of web browser • Common web browsers o Google chrome o Microsoft Edge o Safari o Mozilla Firefox • Importance of browsing • Searching online resources (text, audio, and video)	Comprehending, analysing and applying
• Define audiobooks in their own words. • Play audiobooks of popular fairytales on smartphones and other devices. • Listen to popular nursery rhymes using smartphones and other devices. • List down the titles of the fairy tales and nursery rhymes they have listened to. • State the benefits of listening to audiobooks.	**Introduction to Audiobooks** • Definition of audio books • Common audiobooks **(**Snow White, Cinderella, Three Little Pigs) • Benefits of listening to audiobooks o Fun learning o Improve listening skills o Learn new words o Helps in pronunciation o Boost imagination o Encourages love for books **YouTube Channel for Audio Books** • LibriVox Audiobooks • Audio Books • English AudioBooks • Greatest AudioBooks **YouTube Channel for Rhyme** • Super Simple Songs - Kids Songs • LooLoo Kids • Little Baby Bum	Exploring, applying, practising

• Define Repetitive Strain Injury (RSI) in relation to body posture. • Identify the potential risks of poor body posture while using computers. • Demonstrate proper body posture while using computers and other devices. • Explain the benefits of following proper body posture.	**Body Posture** • Body posture • Benefits of following correct body posture • Risks of poor body posture	Applying, exploring

CLASS IV		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**
• Define typing tutor. • Carry out activities provided in the online typing tutor. • Apply correct finger positions on the keyboard to practice typing. • Explain how online typing tutors help in the improvement of keyboarding skills • Type in Dzongkha using a word processor.	**Online Typing Tutor and Typing in Dzongkha** ● Definition of online typing tutor ● Examples of online typing tutors o Typing.com, TypingClub, TypingMaster, and Typesy o TypeAbility o Talking Typing Teacher ● Keyboard finger placement o Home row, top row, bottom row o Advantages of using typing tutor **Typing in Dzongkha** o Vocabulary and terms acquired in Dzongkha subject o འདོ་གས་ཅན། ཡ་བཏགས་། ར་བཏགས། ལ་བཏགས། o མགོ་ཅན། ར་མགོ། ལ་མགོ། ས་མགོ། o ཕ་རྒྱུད། o འ་ཚུད་།	Observing, identifying and comprehending
• Define hardware with examples.	**Computer Hardware** ● Definition of hardware ● Examples of hardware:	Observing, identifying and comprehending

• Explain the functions of different computer hardware components. • Classify different computer hardwares into input, processing, output, and storage devices. • Categorize computer hardware into internal and external hardware components. • Explain the importance of computer hardware in functioning of a computer.	o Monitor, keyboard, mouse, CPU, printer, speakers, headphones, pen drive • Functions of different computer hardware • Four major categories of hardware: o Input, processor, output, and storage • Internal hardware: o CPU, Motherboard, RAM, Hard Drive, Video Card. • External hardware: o Monitor, keyboard mouse, printer, pen drive, speaker, headphones • Importance of hardware in the functioning of a computer	
• Explain character formatting with examples. • Identify different types of character formatting tools in a word processor. • Apply appropriate character formatting to text, including alphabets and numbers in a word processor. • Explain the importance of applying character formatting in documents.	**Character Formatting** • Definition of character formatting • Font type, Font style, Font size, Font color • Text highlighting • Purpose of character formatting: o Enhancing readability o Communicating emphasis in documents o Effective communication **Hotkeys** • Bold (Ctrl + B) • Italic (Ctrl + I) • Underline (Ctrl + U) • Select text character by character (Shift + Arrow keys) • Copy (Ctrl + C) • Paste (Ctrl + V) • Cut (Ctrl + X) • Select text character by character (Shift + Arrow keys) • Select text word by word (Ctrl + Shift + Arrow keys) • Select text from the cursor position to the beginning of the line (Shift + Home)	Exploring, formatting, and creating

	• Select text from the cursor position to the end of the line (Shift + End) • Select text from the cursor position to the beginning of the document (Ctrl + Shift + Home) • Select text from the cursor position to the end of the document (Ctrl + Shift + End)	
• Explain the benefits of using the Internet to search for information. • Identify how the Internet has been used by different agencies to enhance their productivity and communication. • Search for relevant information from the Internet to get a deeper understanding of the concepts learned in other subjects.	**Benefits of Internet** • **Definition of Internet** • **Examples of ISP** • **Benefits of Internet** o **Business, banking, entertainment** o **education, medicine, etc.** o **Search information on the Internet**	Accessing, exploring, analysing and evaluating
• Identify common web browsers accessible on smartphones. • Navigate the browsers on smartphones. • Follow the correct steps to install a news app. • Use apps to access national and global news on smartphones. • Explain the importance of using apps on smartphones. • Read online news and information by accessing the internet. • Explain different types of online news. • List websites for national and global news. • Explain how the Internet helps people stay updated and informed about national and global situations.	**Browsing news with smartphone** • Types of Mobile browser: o Chrome, Safari, Firefox, Microsoft Edge, Opera • Navigation of browsers on smartphones. **News Apps** • Steps to use news Apps o Download (from Play Store & App Store), install, open app, set preferences • Importance of using apps on smartphones. **Online News Sources** • Introduction to Online News • Types of online news (Local news, international news, national news, educational news , entertainment news, religious news) • List of global and national news websites:	Evaluating, identifying, demonstrating and exhibiting

	○ National News - bbs.bt, kuenselonline.com, the bhutanese, bhutantimes.com ○ Global news - cnn.com, bbc.com • Role of Internet to help stay informed about current national and global news	
• Explain the concept of Data Backup. • Identify the important data that should be backed up for future reference. • Create multiple copies of important data on different devices. • Explain the importance of data backup in times of unexpected data loss or disruption.	**Data Backup** • Definition of Data Backup • Types of Data to Backup: ○ Images, documents, music, videos • Data Backup Methods: • Types of data backup method (local backup method)	Exhibiting, demonstrating, applying
• Verify the sources of global and national news gathered from online sites. • List credible sources of global and national news. • Cite the sources when sharing online news or information with others. • Explain the importance of acknowledging the sources of online news.	**Acknowledging Sources of Online Information** • Explaining of acknowledgement of sources • Identifying Sources of News: ○ Identifying and verifying the sources of global and national news • Acknowledgement of news accessed from websites and online platforms.	Exploring, applying

CLASS V		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**
• Apply proper finger placement for all letters and numbers on the keyboard. • Type words and sentences according to the activities provided in the typing tutor. • Maintain a minimum typing speed of 15-20 wpm with	**Touch Typing** ● Typing Skills ○ Home row keys ○ Proper finger placement and posture • Special Characters and Numbers ○ Numbers and symbols	Identifying, analysing and comprehending Demonstrating

80% accuracy using an online typing tutor. • Explain the advantages of having good keyboarding skills. • Type Dzongkha words and sentences using MS Word.	o Using the shift key for uppercase letters and special characters • Practical Typing Exercises o Common words and phrases o Sentences and short paragraphs **Typing in Dzongkha** o Type text learned in Dzongkha subject o ཨཐུག་པོའི་ཡི་གུ། o ལོག་ཡིག། o ཨགོ་རྒྱན་གྱི་རིགས།	
• List paragraph formatting features available in word processors. • Apply paragraph formatting on MS Word documents. • Utilize the spelling and grammar tools in MS Word to check for errors. • Perform paragraph editing actions in MS Word documents. • Explain the benefits of paragraph formatting in MS Word documents.	**Paragraph formatting** • Basic paragraph formatting o Line spacing o Indentation o Paragraph alignment o Bulleting and numbering • Spelling and grammar check • Copying and pasting text o Selecting text o Cut, copy, paste, paste special. • Benefits of paragraph formatting o Improved Readability o Visual Hierarchy o Organization o Consistency o Space Management o Customization **Hotkeys** • Spelling/grammar (F7) • Center-align the paragraph (Ctrl + E) • Left-align the paragraph (Ctrl + L) • Right-align the paragraph (Ctrl + R) • Justify the paragraph (Ctrl + J) • Selects text paragraph by paragraph upward (Shift + Up Arrow)	Exploring, formatting

	• Selects text paragraph by paragraph downward (Shift + Down Arrow) • Selects the paragraph above the current cursor position (Ctrl + Shift + Up Arrow) • Selects the paragraph below the current cursor position (Ctrl + Shift + Down Arrow) • Selects the entire document (Ctrl + A) • Copy (Ctrl + C) • Paste (Ctrl + V) • Cut (Ctrl + X) • Apply or remove bullet and numbering (Ctrl + Shift +L)	
• Define software in their own words. • Explain the functions of commonly installed software on a computer. • List common software used in a computer system. • Describe how hardware and software work together in the functioning of a computer. • Explain the benefits of using different software to perform tasks.	**Computer software** • Definition of computer software • Functions of commonly installed software • Examples of computer software • Relationship between hardware and software • Purpose of using different software	Accessing, and exploring

• Define the concept of online learning platforms.
• Identify online learning platforms, websites, and YouTube channels for additional information.
• Use the Internet to search, access, and navigate online learning platforms and resources.
• Save useful online resources in the computer system for future reference.
• Explain the importance of using online learning platforms to foster independent exploration and learning.
	Internet Use
	• Accessible and Inclusive Learning Resources
	  o Online Learning Platforms
	  o Websites and Educational Resources
	  o YouTube Channels
	• Using and saving the Internet to Access Learning Resources
	• Importance of Online Resources for Independent Learning
	
	Online Learning Platforms
	• Online learning platforms
	• List of mobile apps for learning (TapTapSee, Be My Eyes, Google Map, Envision AI, Instant Reader, Cash Reader)
		Accessing, exploring

• List some useful applications that provide online learning and resources. • Explain the benefits of using smartphones to access online learning platforms and resources.	• Importance of independent learning o Empowering independent learning • Inclusivity and equal opportunities	

• List various data backup strategies, including saving copies in multiple devices.
• Use data backup methods to store useful files and resources.
• Restore temporarily deleted data from the Recycle Bin.
• Explain the importance of safeguarding important data through regular backups to prevent irreversible data loss.
• Explain different types of malwares with examples.
• Describe the behavior and effects of malware on infected devices.
• List different measures to prevent computers and smartphone devices from malware infections
• Make a presentation on the risk of malicious software and the benefit of data back.
	Data Backup
	• Data backup strategies:
	  o Local backup strategies
	• Risks associated without data backup.
	• Data recovery
	  o Discuss data recovery method to retrieve lost data.
	• Benefits of performing data backup
	
	Malicious Software
	• Definition of malware
	• Different types of malwares:
	  o Virus, worms, trojan horse, ransomware
	• Signs of malware infected system:
	  o slow computer
	  o blue screen of death
	• lack of storage space, Pop ups, websites, toolbars, and other unwanted programs
		Exploring, exhibiting, applying

• Verify the sources of information or materials gathered from the Internet. • Distinguish between primary and secondary sources of online information. • Cite the sources while sharing online resources or information with others. Explain the importance of acknowledging sources when using online information or resources.	**Acknowledgement of Online Sources** • Identifying the source of information • Types of sources (primary and secondary) • Cite sources of online information • Importance of source acknowledgement	Applying, analysing Exploring

CLASS VI		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**
• Demonstrate correct posture and hand/finger placement while typing. • Type letters, words, numbers, sentences, and paragraphs using a typing tutor. • Maintain a minimum typing speed of 20-30 wpm with 90% accuracy using an online typing tutor. • Explain how accurate and efficient typing contributes to effective communication and productivity in the digital age. • Explain the benefits of touch typing. • Type complex Dzongkha scripts and sentences using MS Word.	**Introduction to Touch Typing** • Benefits of Touch Typing • Proper posture and hand/finger placement while typing • Typing Proficiency o Typing accuracy and speed • Accurate Typing for Effective Communication and Productivity o Importance of Accurate Typing o Real-life Applications **Dzongkha Typing** o སྒྲག་ཀྱི་ཡི་གུ་ཚུ་འབྲི་ཐངས་སྤྱད་སྤྱང་འབད་ནི།	Exploring, demonstrating, exhibiting
• Add tables in a Word document. • Apply table formatting features in a Word document. • List page formatting options in MS Word documents. • Apply page formatting tools in MS Word documents. • Insert page numbers in MS Word documents. • Print MS Word documents after applying table and page formatting. • Explain the importance of table and page formatting to improve organization of information.	**Table Formatting** • Create and delete the table • Navigate within the table • Enter information in the table • Insert rows and columns • Delete rows and columns • Copy, cut and paste cell contents • Autofit to contents • Merge and split cells **Page Formatting** • Page Layout: o Page orientation (portrait and landscape) o Margins o Page size • Headers and Footers: o Adding headers and footers o Page numbers • Printing a document: • Steps to print a document	Exploring, identifying, formatting, creating

• Define software with examples. • List different software or applications that are commonly used by learners with vision impairment. • Identify the types of software and their functions. • Explain the significance of using software in a computer system. • Customize the settings of a screen reader to accommodate individual preferences and accessibility needs.	**Software** • Definition of software with examples. • Types of software: o System software o Utility software o Application software (Screen readers) • Purposes of different software types. • Importance of software	Accessing, evaluating, identifying and communicating
• Define the term bookmark. • Use browser bookmark features to save and organize relevant online sites, resources, and tutorials. • Explain the advantages of maintaining a curated list of online resources using bookmarks.	**Bookmark** • **Defining Bookmarks** o Purpose and function of bookmarks o Quick access to websites • **Using Browser Bookmark Features** o Bookmarks in web browsers o Organization and management of bookmarks o Accessing saved bookmarks from different devices • **Advantages of using bookmarks** o Benefits of a curated list of online resources o Saving time and effort in locating resources	Accessing, and collaborating
• Define an email. • List common email service providers. • List the key features of email. • Create a personal email account for communicating with others. • Use email to compose, send, receive, and organize emails. • Explain the importance of email for effective collaboration and efficient information dissemination.	**Introduction to Email** • Defining email o Concept of email o Purpose of email communication • Identifying email Service Providers: o Common email service providers o Choosing a service provider for personal email accounts • Email Features: o Email functions (compose, send, receive)	Identifying, analysing, evaluating and communicating creating

	○ Managing emails (labels, search) • Creating a Personal email Account: ○ Steps to create a personal email account ○ Customizing email settings • Using email Software: ○ Composing emails ○ Sending and receiving emails ○ Managing email threads • Importance of Effective email Communication: ○ Clear and concise email communication ○ Respectful email etiquette • Timely responses and collaboration in emails	
• Explain the use of smartphones as tools for research and exploration in various subjects. • Search for online resources, articles, and materials related to other subjects using smartphones. • Describe the importance of smartphones in offering flexibility and continuous learning.	**Research with smartphones** • Using smartphones for Research and Exploration: ○ Smartphone capabilities for research ○ Benefits of smartphones in subject exploration • Searching for Online Resources on smartphones: ○ Effective online search on mobile devices ○ Finding subject-specific materials and articles • Importance of smartphones in Continuous Learning: ○ The role of smartphones in flexible learning ○ Beyond Classroom Learning	Creative thinking, communicating and creating
• Define password. • Distinguish between a strong and a weak password. • Create a strong password that meets password standards. • Use passwords to keep data safe. • Explain the benefits of having a strong password.	**Password Management** • Definition of password • Function of password • Features of a strong password • Setting passwords for personal account • Benefits of using passwords to keep personal data safe and secure	Exploring, Applying, and creating

• Identify the principles used for evaluating online resources and information. • Evaluate the credibility and reliability of online resources and information. • Explain the ethical responsibility of validating online resources.	**Online Resource Validation** • Principles for evaluating online Resources: o Credibility, relevance, multiple sources, and accuracy • Fact-checking and source verification • Prevention of spread of false information • Relevant and trustworthy materials	Evaluating, validating, exploring

CLASS VII		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**
• Create a simple PowerPoint/Google slide presentation by using relevant features. • Differentiate between PowerPoint presentation and Google slide. • Apply design principles such as 10-20-30 rules to communicate ideas. • Deliver a presentation using a PowerPoint presentation/Google slide to share information or ideas learned in other subjects including Dzongkha.	**PowerPoint Presentation** • Introduction to Presentation Software • Understanding different presentation software (e.g., PowerPoint presentation, Google Slides, Keynote) • Exploring the interface and basic features. • Creating a PowerPoint presentation/Google Slide • Slides, templates, texts, objects, etc. • Design Principles o PechaKucha 20X20 o 10-20-30 rules • Transition using sound effects, hyperlinks, etc • Presentation in PowerPoint Presentation/Google Slide	Exploring, designing, and creating, demonstrating
• Identify different file extensions. • Convert files using online and offline file conversion tools. • Utilize online and offline tools to convert different file extensions. • Share the benefits of converting files from one format to another.	**File Conversion** • File Conversion Basics: o Importance of File Formats o Differences Between Word, PowerPoint, Webpages, and PDFs o Scenarios Requiring File Conversion • Online File Conversion:	Exploring, and creating

	○ Conversion of Word Documents, PowerPoint, Webpages, and PDF files online ○ Pros and Cons of Online Conversion Tools ● Offline File Conversion: ○ Converting Word Documents, PowerPoint Documents, and PDF files Using Offline Software ○ Quality and Security: ○ Readability, Image Resolution, and Formatting ● Password Protection for converted files where necessary.	
● Select relevant audio tools to record audio for editing purposes. ● Record/import the sound for expressing the ideas. ● Edit recorded sounds to create audio materials on topics learned in other subjects including Dzongkha. ● Express ideas through audio format files by sharing on relevant platforms. ● Demonstrate moral practices in sharing audio materials.	**Audio Editing** ● Definition of audio editing tool. ● Types of audio editing tools ● Different audio editing tools (Audacity, Adobe Audition, Garageband, etc.) ● Recording audio: ○ Recording devices and steps. ○ Audio recording and editing ○ Recording or importing audio. ○ Editing Audio and mixing ○ Applying Audio Effects ○ Saving ● Audio sharing ● Project on audio editing.	Accessing, and exploring
● Use search techniques to retrieve information from various online sources. ● Express understanding on any given topic by gathering information from articles, multimedia, and educational websites. ● Authenticate sources of online information	**Online Research** ● Basic Search Techniques: ○ Keyword Wizards ○ Safe Online Navigation ● Critical Information Retrieval: ○ Trustworthy Sources ○ Spotting Fake Information ● Evaluating Website Credibility	Analysing, comprehending, communicating and collaborating
● Explain what social media is and its types. ● Utilize computers/smartphones to access a social media	**Social Media Use on Computer/Smartphone** ● Introduction to Social Media: ● **Using social networking**	Identifying, comprehending and exhibiting

platform for communication purposes. ● Demonstrate the ability to send and receive messages, photos, and videos on the platform. ● Explain the role of computer/smart phones in enabling communication with peers and family. Practise proper social media etiquette while participating in social networks	o Definition and purpose of social media o Types of social media applications o Examples of popular social media platforms ● Social Media App Etiquette and Usage: o Creating a Safe Profile o Navigating the App Interface o Posting, Sharing, and Interacting Messaging and Chatting	
● Define email attachment in simple words. ● Demonstrate the process of sending and opening email attachments of different files. ● Explain the importance of sharing files using email to enhance collaboration and communication.	**Email Attachment** ● Attaching, Sending, and Opening Email Attachments: o Attaching Files o Sending Attachments o Opening Attachments ● Benefits of Sharing Files via Email: o Efficient communication and collaboration o Documentation and record-keeping advantages o Collaborative editing and version control. o Cross-platform compatibility o Security and privacy considerations in email attachments	Creating, and communicating
● Explain privacy and its importance. ● Create strong passwords for social media accounts. ● State the value of personal data and the importance of safeguarding it from unauthorized access or misuse.	**Privacy and Security** ● Understanding Privacy in the Digital Age ● Privacy Settings on Social Media ● Risks of Inadequate Privacy Protection ● Password Creation Strategies	Applying, demonstrating and exploring

• Define positive digital identity.
• Create/share content on social media that reflects one's interests, values, and expertise in a responsible and positive manner.
• Explain the importance of fact-checking practices to verify the authenticity of content.
• Demonstrate digital ethics by respecting intellectual property through citation.
	Positive Digital Identity
	• Definition of Positive Digital Identity
	• Importance of fact-checking practices
	  o Accuracy, preventing misinformation, maintaining credibility, protecting others.
	• Digital Etiquette and Responsible Content Creation
	• Online Community Building and Engagement
	• Digital Ethics
	  o Copyright Detectives
	  o Citation
		exploring, evaluating, analysing and demonstrating

CLASS VIII		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**

• Use both online and offline file conversion tools proficiently.
• Describe different file formats, their characteristics, and compatibility across various platforms and devices.
• Apply ethical principles related to intellectual property, plagiarism, and proper attribution.
	Converting Files to Different Formats
	• Understanding File Formats:
	  o Understanding the concept of file conversion
	  o Why file conversion is important for accessibility and compatibility
	  o Examples of common file formats and their uses
	• Types of File Formats
	  o Exploring different types of files
	  o Introducing various file formats and extensions
	• Online Tools for File Conversion
	  o How to use user-friendly online converters
	  o Safety precautions while using online tools
	• Offline Tools for File Conversion
	  o Basic overview of popular offline tools
		Exploring, creating and demonstrating

	○ Hands-on practice with converting files using offline software ● Accessibility and Compatibility ○ Understanding accessibility in the context of digital files ● How file conversion improves accessibility for people with disabilities	
● Create PowerPoint presentations by incorporating audio descriptions on any subject, including Dzongkha. ● Design interactive presentations using accessible features. ● Explain the significance of utilizing accessible tools in PowerPoint/Google Slides to convey concepts and messages effectively.	**PowerPoint Presentation** ● Adding descriptive audio, videos and audio annotations ● Adding transition effects ● Adding hyperlinks ● Creating a Google Slides presentation ● Project - Creating an interactive presentation on topics learned in other subject	Recording, uploading, modifying exploring, designing
● Explain the functions and features of video editing tools. ● Create a 1-2 minutes project using video editing tools. ● Explain how video content can effectively convey information and ideas.	**Video Editing** ● Understanding Video ○ Definition of Video ○ Understanding videos and its significance in modern media ● Video Editing Tools ○ Introduction to Various Video Editing Tools (E.g. Reaper) ○ Features: Copy, cut, paste, trim, import, export, add background music, split)	Accessing, evaluating, creating analysing and advocating
● Explain the basic features and functions of online blogging platforms. ● Create a personal blog using online platforms. ● Write the importance of blogging.	**Blogging** ● Online Blogging Platforms ○ Introduction to Blogging Platforms (Blogger/WordPress) ○ Content Creation ○ Customization and Design ● Creating a Personal Blog: ○ Creating a Blog ○ Writing Content ○ Scheduling Posts ● Importance of Blogging ○ Power of Blogging	Accessing, designing, communicating and collaborating

	○ Connecting with a Wider Audience ○ Responsible Blogging	
• List at least 3 reputable online sources and databases relevant to STEM subjects for further research. • Use search engines and online research tools to access and navigate online STEM content. • Explain the importance of critical evaluation and fact-checking when utilizing online resources in STEM subjects.	**Online Research on STEM Subjects** • Reputable Online Sources for STEM Research ○ Reputable Online Sources ○ Databases and Research Repositories • Search Engines and Online Research Tools for STEM Content: ○ Effective Search Techniques ○ Online Libraries and Repositories ○ Online Research Tools • Critical Evaluation and Fact-Checking in STEM Research: ○ Critical Evaluation Principles ○ Fact-Checking in STEM • Avoiding Misinformation and Disinformation	Evaluating, analysing and exhibiting
• Identify the purpose, rules, and norms of various social networking groups and learning communities. • Engage in meaningful discussions within social networking groups. • Explain the importance of being respectful and ethical while communicating in social networking groups. • Follow the process of joining and participating in a selected educational social networking group.	**Social Networking Groups** • Purpose, Rules, and Norms of Social Networking Groups (Telegram, Messengers, Facebook pages, WhatsApp groups, etc.): ○ Group Purpose ○ Group Rules and Guidelines ○ Community Norms and Culture. • Sharing Resources, and Seeking Information: ○ Effective Participation. ○ Resource Sharing and seeking information. • Respectful Communication • Positive Contribution and Collaboration. **Joining and participating in Group** • Guide learners through the process of joining.	Evaluating, analysing and exhibiting, communicating
• Use the G2C services for availing online services. • List the different services available on the G2C platform.	**Online Government Services** • Definition of Government to Citizen services • G2C services in Bhutan	Demonstrating, collaborating and exploring

• Identify the benefits of using the G2C services for efficiency and productivity. • Create an awareness program to their parents and community to share the benefits of G2C services.	o Security clearance, RSTA, Druk Trace o Citizenship, Doctor appointment o Security clearance, Land tax, Passport • Benefits of G2C services to society • Project - using G2C service o Supporting parents to use online services o awareness on online services	
• Explain common ways in which online data security and privacy are compromised. • Apply effective measures to mitigate data security and privacy risks. • State reasons for protecting personal and others' data, and respecting privacy in online interactions and activities. • Discuss the Legal obligations related to data protection and privacy • Explain the consequences of unethical behavior online	**Online Security and Privacy** • Data security and privacy o Phishing Attacks o Data Breaches • Effective Security Measures o Strong Passwords o Enabling Two-Factor Authentication (2FA) o Data Encryption • Data Privacy and Trust o Trust in online interactions o Violating trust in online relationships • Legal and Ethical Considerations o Legal obligations related to data protection and privacy. o Consequences of unethical behavior online	Analyzing, applying, and demostrating
• Explain the principles of a positive digital identity and the impact of responsible technology use on one's online reputation. • Exhibit responsible use of technology while participating in online communities. • Engage in social media groups and communities, promoting constructive discussions and sharing valuable contents. • State the importance of a respectful and responsible online presence. • Demonstrate empathy and ethical behavior while	**Positive Digital Identity** • Understanding Digital Identity o Definition and components of digital identity o Online behavior and one's digital identity • Effective Community Participation: o Active participation in online communities o Initiating and joining discussions • Constructive Discussions: o Guidelines for promoting and maintaining constructive conversations	Analyzing, applying and collaborating

participating in digital communities. • Explain the guidelines for constructive conversation • Explain the key values associated with contributing positively to digital communities.	o Handling disagreements and conflicts • Sharing Valuable Content: o Value addition to the community through content sharing o Techniques for sharing content that informs, educates, or entertains • Respectful Communication: o Respectful and empathetic communication • Ethical Behavior: o Ethical behavior in digital interactions o Online fraud, piracy, and plagiarism • Online Community Building: o Community and trust in online groups • The value of contributing positively to digital communities	

CLASS IX		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**
• Explain the concept of an Excel worksheet, including its purpose and role within a spreadsheet application. • Navigate Excel menu and cells • Enter data into specific cells of the worksheet as required. • Use Excel to select and manipulate specific cells, rows, columns and certain dialog boxes within a worksheet. • Format different types of data as per certain conditions • Apply cell referencing conditions to reflect accurate data entry. • Apply basic Excel mathematical functions efficiently.	**Introduction to Excel** • Define an excel worksheet. • Purpose and role of excel sheet. • Creating and saving excel spreadsheet • Cell referencing **Formatting cell or cell range** • Navigate in a worksheet • Enter and delete data • Select, copy, cut and paste cells. • Insert or delete a cell, rows and columns. • Selecting cell or cell range • Merging and splitting cells • Applying borders	Exploring, organising, analysing, problem solving, decision making and creating

	Functions in excel • Create formulas using basic arithmetic operators • Basic mathematical functions sum(), average(), product()	
• Identify software or application that is compatible with computers and smartphones/tablets by considering accessibility and system requirements. • Examine the importance of installing and uninstalling software/applications to address accessibility issues. • Demonstrate correct procedures of installation and uninstallation of software/application on computers and smartphones/tablets. • Explain ethical considerations related to user privacy and data security while installing application software. • Update software/apps in smartphones by downloading from app store/play store.	**Computer software/Application:** • Introduction to computer software/application o Play store/app store o Safe search methods for specific social media apps o Steps to download, install, and update software/apps • Purpose of installation and uninstallation of software/application • Configuration of screen readers such as JAWS/NVDA. • Importance of user privacy, data security and accessibility software/application	Identifying, analysing, applying and problem solving
• Explain cloud services with examples. • List down different collaborative tools on Google Workspace. • Explain Google drive and its significance in cloud-based file storage and collaboration. • Identify the advantages and challenges of using Google drive. • Create folders and subfolders to manage files and folders in Google drive. • Upload/download files and folders on google drive • Access files and folders on Google Drive from different	**Cloud Services** • Definition and examples of cloud services. • Benefits of cloud services. • List of Google workspace tools. **Google Drive** • Introduction to Google drive tool. • Benefits and drawbacks of utilizing Google Drive. • Navigating to Google drive. • Creating folders and subfolders. • Upload and Download Files and folders • Content management and organisation	Accessing, identifying, collaborating and exploring

devices including smartphone, computer, tablet.		
• Differentiate between blog and vlog. • Explain significance of blog/vlog in the digital age. • Identify key elements and features of a typical vlog. • Elaborate the basics of managing a blog/vlog. • Create diverse content types for blogs, including text posts, images, videos, and links. • Carryout editing, formatting and proofreading of content before publishing. • Demonstrate the ability to maintain and manage a blog/vlog using an online platform to share information on relevant topics.	**Introduction to blog/vlog:** • Understanding difference between blogging and vlogging • The role of blog/vlog in the digital age. **Key elements of blog/vlog** (blog/vlog title, author's name, date, content area, tags) • Key blogging terminology (post, comment, tag, archive) **Creating a blog/vlog** • Setting up a blog/vlog • Video blogging (vlog) • Management and formatting of content **Proofreading, editing and publishing content** • Importance of proofreading, editing and publishing content • Formatting content **Advanced Content Management** • Organize and manage content (using tags, categories, archives, Comments, Feedback, responding)	Comprehending, evaluating, identifying, creating, collaborating and exhibiting
• Present benefits of participating in educational social networking groups. • List the relevant educational social networking groups or communities. • Participate in relevant social networking groups based on individual needs and interests.	• **Benefits of Educational Social Networking** • Benefits of participating in social networking groups. • **Selecting Relevant communities** • Relevant educational social networking • Choosing the relevant social networking groups based on their interest.	Comprehending, exhibiting, and exploring
• Define the terms fake news, fake accounts, and cyberbullying. • Recognize the common characteristics of fake news and fake accounts.	**Online Safety:** • Definition of fake news and fake accounts. • Verifying fake news and fake accounts.	Accessing, identifying, creating, protecting and evaluating

• Differentiate between credible and unreliable information. • Explain different forms of cyberbullying and its impact on mental health and well-being. • Explain ways to deal with negative online experiences with examples to create awareness. • Demonstrate empathy and responsible digital citizenship by fostering a safer online environment.	• Ways to fight against fake or negative online information. **Cyberbullying**: • Definition of cyberbullying • Examples of cyberbullying • Measures to cope with cyberbullying. • Roles of bystanders and upstanders in cyberbullying • Effects of cyberbullying • Providing support to victims of cyberbullying • Project on dealing with negative online experiences. • Legal consequences of cyberbullying	

CLASS X		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**
• Perform basic data analysis using common spreadsheet functions to make relevant data interpretation. • Create simple data validation rules to restrict certain data to be entered into cells. • Apply the knowledge of functions and formulas in real-world scenarios and problem-solving tasks.	**Data Analysis in MS Excel** • Data analysis: Data collection, cleaning, analyzing • Syntax to Enter formulas and functions • Basic excel functions - Count(), Counta() ,Max(), Min(), RANK() • Basic logical functions - if(), and(), or(), countif(), countifs() • Project: Analysing data with a spreadsheet.	Exploring, organising, analysing, collaborating, designing and creating
• Categorize common computer problems, including issues like software glitches, hardware failures, and network connectivity problems • Run troubleshooting to fix computer errors. • Use relevant online resources to find out solutions and assistance for computer issues.	**Troubleshooting Common Computer Issues:** • Introduction to the Troubleshooting Common Computer Issues. • Importance of troubleshooting skills. • List of common computer problems (slow processor, software malfunction, no wifi-access, IP issues for Internet connection, unable to connect external devices, etc.).	Accessing, analysing, implementing, and exploring

• Demonstrate problem-solving skills by independently resolving common computer issues. • Run command prompt to delete temporary and unused files.	• Troubleshooting Process • System Maintenance Tools & Techniques • Disk cleanup, and disk fragmentation. • System restore, restart, higher storage or processor, etc. • Deleting temporary files through the Run command.	
• Explain how to share files and folders with others using Google Drive. • Demonstrate how to work collaboratively on a document or file in real-time by using features available in Google workspace. • Set permission for viewing, editing and commenting. • Manage shared files including how to add those shared files to My Drive. • Explain the importance of data security on Google Drive including privacy setting and sharing controls. • Facilitate team projects and assignments that require collaboration skills using Google workspace.	**Google Workspace Overview:** • Explaining the overview of Google Workspace and its features: • Cloud storage for files and folders. • Files sharing and collaboration capabilities. • Compatibility with various file types (documents, spreadsheets, presentations, etc) **File Sharing** • Explaining how to share files and folders with others using Google workspace. • Sharing options (view, edit, comment) and how to control access. • Shared files/folder management **Collaboration Editing** • Demonstrating how to collaborate on a document or file in real-time. • Comments, suggest edits and track changes in documents.	Evaluating, collaborating, sharing, analysing and exhibiting
• List down the advantages and disadvantages of using smartphones as research tools. • Execute skills in using smartphones for conducting research to gather informational data through web browsing, app usage, and note-taking. • Evaluate the credibility and reliability of online sources. • Distinguish between trustworthy and biased or inaccurate information.	**Mobile Research Strategies:** • Various ways to use smartphones/tablets for research. • Highlight the advantages and disadvantages of mobile research. **Searching and Evaluating:** • Importance of evaluating information sources. • Types and categories of educational apps available for various subjects.	exploring, organizing, evaluating and searching

● Utilize educational apps, online databases and digital tools to access academic journals, articles, videos, and interactive content relevant to the subjects being researched.	● Popular educational apps such as Khan Academy, Coursera, or Udemy.	
● Explain the concept of plagiarism and its various forms. ● List ethical implications of plagiarism and its impact on original creators. ● Use citation and reference sources to avoid plagiarism. ● Apply techniques and red flags to detect potential online scams. ● Implement strategies for protecting personal information and online security to prevent scams.	● Plagiarism: Definition and its Various Forms. ● Consequences of plagiarism in academics, professional settings, and creative works. ● Importance of academic honesty and its role in education. o Common online scams: Real-life examples and their impact on individuals and businesses.	Logical, sequential, and creative thinking, creating, debugging, documenting, identifying problems and formulating solutions.
● Explain the importance of media ● literacy in the era of media overload. ● Identify different types of media or construction or deconstruction of its content. ● Evaluate different media content using the five key questions for making informed decisions about the media content.	**Media Literacy** ● Definition of media literacy ● Importance of media literacy ● Types of media (print, broadcast, online, etc.) ● Deconstruction of media ● Five key questions (authorship, format, audience, content, purpose). ● Project on construction or o deconstruction of a media text.	evaluating, analysing, creating and demostrating

Class XI		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**
• Identify music production software accessible with screen readers. • Explain the functions of tools and features in the music production software. • Explore navigating the software layout and tools. • Create simple tunes using music production software. • Compose music tracks for songs.	**Understanding Software Features:** • Paid/free music production software (Such as: Reaper, Ableton Live, Sonar, Goldwave, Samplitude and etc.) **Music Production Software**: • Functions of music production software • Navigating the software layout and tools, such as tracks, mixing, and editing features. **Creating Simple Tunes:** ● Melody ● Rhythms ● Harmonies	Exploring, analysing, designing and creating
• List down the common assistive technologies and devices. • Explain the common application of assistive technologies and devices. • Use available assistive technology and devices in day-to-day life.	**Assistive Technologies and Devices** • JAWS • NVDA • Perkins Brailler • White Cane • Embosser • Duxbury • Braille Display • EVO 10 Daisy Player • Hearing Aids • Smartphone • Laptop • Desktop • Analog wrist watch • Talking watch • CCTV • Talking atlas • Scanner • Talking book • Open book • Talking calculator • Magnifier	Evaluating, analysing and comprehending
• Create Google Docs documents to share with peers. • Edit a shared Google Docs document with constructive	**Collaborative Features** ● Sharing documents with peers ● Setting permissions (view, comment, edit).	Evaluating, analysing, collaborating and comprehending

feedback provided through comments and suggestions • Apply various formatting tools to enhance readability and collaborative document sharing • Collaborate with peers/team members on real-time document editing.	• Using comments for collaborative editing and feedback. • Using real-time collaboration to work on the document simultaneously. **Advanced Document Editing** • Inserting tables, images, and links. • Adding headers, footers, and page numbers. • Creating and managing a table of contents.	
• Demonstrate verbal and non-verbal communication skills. • Use various features of video conferencing platforms. • Deliberate on advantages and disadvantages of webinars. • Exhibit professional etiquette of virtual meetings. • Express through reflective sharing on how conferencing enhances learning. • Apply troubleshooting to resolve common issues on webinar platforms.	• **Definition** • **Accessibility features** • **Effective Communication** • **Collaboration and support** • Attending Webinars • Advantages and disadvantages of webinars. Problem Solving • Troubleshooting common issues: microphone, audio, or connectivity problems. Practical Application: • Participate in a mock video conference using features such as muting/unmuting, chatting, and raising hands. • Collaboratively share and discuss ideas in a group meeting.	Evaluating, analysing, designing and creating
• Demonstrate effective communication techniques • Exchange relevant resources, strategies and tools for professional growth and problem-solving. • Provide constructive feedback to foster trust. • Explore Modes of Participation in PLCs • Explain the benefits of engaging in PLCs • Share how PLCs can be made inclusive	• Understanding Professional Learning Communities (PLCs) • Definition of PLCs. • Importance of PLCs in learning. • Modes of Participation in PLCs • **Virtual PLCs**: Online forums, discussion groups, and video meetings. • **Physical PLCs**: Classroom or small-group discussions. • **Blended PLCs**: Combining virtual and physical interactions. • Sharing Information and Resources • ***Inclusive Practices in PLCs*** o **Benefits of Engaging in PLCs**	exploring,and analysing

• Define Massive Open Online Courses (MOOC). • Share the importance of MOOC. • Evaluate the relevance of chosen MOOC in line with academic learning. • Utilize online learning resources from MOOC for academic learning. • Attend a selective MOOC for certification	**Introduction to MOOCs** • Definition with examples • Importance • Finding Accessible MOOC Platforms • Enrolling in a MOOC • Creating an account • Browsing courses • Enrolling **Navigating the Course Content** • Reading and accessing materials • Attending video lectures • Participating in forums **Tracking Progress** • Monitoring course progress using accessible dashboards. • Setting weekly or daily goals to stay on track. **Earning Certificates** • Completing the course requirements (lectures, quizzes, assignments). • Downloading or requesting a certificate after course completion.	organizing, accessing, evaluating and collaborating
• Explain the Social Media Policy of Bhutan. • Create awareness on Social Media Policy of Bhutan • Adhere to Social Media Policy of Bhutan through ethical use of technology and media. • Ensure privacy and security of personal and shared data Promote responsible behavior and digital citizenship online	**Social Media Policy of Bhutan** • Code of conduct • Social media awareness **Privacy and Data Security** • Multi-factor authentication (MFA) • End-to-end encryption **Digital citizenship** • Definition of digital citizenship • Its importance in responsible technology use.	

CLASS XII		
Learning Objectives (KSVA)	**Core Concepts (Chapters/Topics/ Themes)**	**Process/ Essential Skills**
• Explore different compositional methods. • Apply editing techniques, tools and features in refining music tracks. • Apply techniques of mixing and mastering of music. • Demonstrate creativity in simple music composition. • Use virtual instruments in music tracks	**Mixing and Mastering**: • Basic mixing principles, such as levelling, panning, EQ, and compression. **Editing and Refining Tracks:** • Cutting • Layering • Adjusting pitch • Tempo • Dynamics • Virtual instruments **Enhancing Music Quality:** • Equalization • Compression • Reverb	designing, creating, evaluating and demonstrating.
• Explore the common assistive technologies and devices. • Explain the functions of common assistive technologies and devices.	**Assistive Technologies and Devices** • GPS • Notetaker • Cash Reader • Speech-to-Text Software • Text-to-Speech Software • Audio description • Dictation software • Communication device • Cameras • Smart glass and etc	accessing, exploring, and evaluating
• Create a spreadsheet to categorize information logically • Apply formula to manage data effectively • Collaborate on projects to work with peers on shared documents. • Demonstrate effective presentation skills	**Collaborative Features:** • Sharing the sheet with peers or teachers for real-time collaboration. • Adding and responding to comments in group work. **Practical Example**: • Learners collaboratively create a table to track class project submissions. Sharing and Disseminating Information • Sharing Files • Collaborating in Real-Time Problem-Solving and Troubleshooting	creating, collaborating, researching, organising and analysing.

	• Navigating accessibility issues: o Resolving issues with screen reader compatibility. o Adjusting settings for optimal accessibility. • Managing errors in formulas or formatting. o Collaborating respectfully by resolving conflicts or overlapping edits.	
• Explore different video conferencing platforms • Explain the steps involved in planning and hosting webinar video conference • Host a simulated video conference. • Build technical and interpersonal skills through a collaborative environment.	Introduction to Video Conferencing • **Purpose** • **Examples of Platforms**: Zoom, Google Meet, Microsoft Teams, and Skype. Setting Up a Video Conferencing Event • **Choosing the Platform**: o Example: Google Meet for simple setups or Zoom for advanced features. • **Creating a Meeting**: o Schedule a meeting with date, time, and title. • **Setting Permissions**: o Adjust access controls for participants (e.g., allowing everyone to join, restricting guests). • **Sharing Meeting Links** o Managing basic controls: muting participants, starting/stopping recordings, and monitoring chat. o Practice presenting a topic in a webinar setting	evaluating, designing and collaborating
• **Demonstrate** collaborative decision-making techniques, such as consensus-building and conflict resolution, through role-playing scenarios. • **Evaluate** the effectiveness of PLC activities by reflecting on group dynamics and outcomes, and proposing improvements for future sessions.	**Leadership in Professional Learning Communities** • Understanding leadership roles in PLCs: facilitator, organizer, and motivator. **Collaborative Decision-Making in PLCs** • Techniques for consensus-building and resolving conflicts in a professional manner.	creating, researching, and organising,.

	• Role-playing scenarios to practice decision-making. **Professional Etiquette in PLCs** • Learning the dos and don'ts of collaborative engagements. • Practicing gratitude and acknowledgment in group settings.	
• Identify MOOC courses relevant to career aspiration • Complete a MOOC course as per the schedule. • Explain benefits and challenges of attending MOOC courses in an evolving educational environment. • Use dictation software for completing assignments	**Engagement with MOOC Content** • Using annotation tools for accessible note-taking. • Participating actively in discussion forums and group projects. **Advanced Tools for MOOC Participation** • Integrating additional tools like calendar apps, task managers, and collaborative platforms. • Using dictation software and transcription tools for better engagement. **Building a Personalized MOOC Learning Pathway** • Exploring courses aligned with career interests or academic goals.	researching, organising, analysing, exploring

• Analyse the impacts of ICT on society with examples.
• List the negative impacts of ICT on individuals to discuss solutions.
• List different emerging technologies with examples.
• Analyze the impacts of emerging technologies on society with examples.
• Adopt measures to reduce the negative impacts of ICT on individuals and society.
• Design a presentation on the impact of ICT and emerging technologies to create awareness
	Impact of ICT on Society
	• Positive Impacts
	  o Entertainment, Media sharing, communication, community support
	  o Innovation, Job market
	  o Crowdfunding, Online learning, E-commerce
	• Negative impacts
	  o E-waste, Digital divide, Health issues
	  o Addiction, Business fraud
	
	Reducing Negative ICT Impacts
	• Benefits of reducing negative impacts
	• Ways to reduce negative impacts.
		critical thinking, problem solving, and analysing

	○ reduce e-waste, recycle, online support communities, etc. ○ Project-Awareness presentation on the impact of ICT on society. **Emerging Technologies** • Examples: IoT, AI, 5G, blockchain, robotics, biometrics, 3D printing, virtual reality, drones, etc. • Impacts of emerging technologies-Job opportunities, education, medicine, business, environment, etc.	
• Evaluate the ethical integration of emerging technologies in society • Explain the long-term societal impacts of digital media and information ecosystems. • Practice personal digital ethics based on the values of transparency and accountability.	• **Technology and Social Responsibility** • **Societal impacts** ○ Digital Divide. ○ Media Manipulation. ○ Ethical decision-making in content sharing and online interactions • Promoting transparency, accountability, and trust in digital spaces.	accessing, exploring, and evaluating

6. TEACHING AND LEARNING APPROACHES

Although a range of teaching and learning approaches can be employed in delivering the ICT curriculum, the following approaches are suggested because of the marked emphasis on competency-based learning in this curriculum. Using these approaches promotes independent learning, facilitates the development of 21st century skills, and enables mastery of learning competencies in learners through creative and authentic problem-solving activities.

However, teachers have the flexibility to choose alternative approaches that are appropriate to the situation, the needs of the learner, and the context of learning. Teachers must be adequately aware of and use skills, technology, and approaches in teaching learners with vision impairments as the general methodologies would not always be effective in meeting their specific learning needs. Teachers also need to provide learners with opportunities to develop an inquisitive attitude, critical thinking, and creative skills using ICT to make them problem solvers and independent life-long learners.

One or more of the following teaching and learning approaches may be considered in the delivery of ICT curriculum in the classroom to make learning engaging and meaningful for learners:

a. Project-based learning

Teachers identify a project that requires ICT knowledge and skills to be completed by the learners. The project can be done individually or in teams depending on the scale of the task. For example, learners create posters, written messages, or audio-visual messages on cyberbullying using accessible multimedia editing tools to create awareness of the negative impacts of cyberbullying.

b. Guided discovery learning

Teachers facilitate the learners by providing multiple resources and giving different activities to help learners discover and acquire ICT knowledge and skills. For example, class six learners can be asked to maintain a journal which can later be transferred into an MS Word document with multimedia features. This allows learners to discover elements of a well-formatted document.

c. Problem-based learning

Teachers identify a problem that is relevant to the learners or their families and communities, and encourage them to use ICT to solve it. This can be given either in pairs or teams and they are also given the flexibility to come up with their own problem. For example, learners identify the stray dog problem in their school, and they come up with different solutions such as creating audio-visual awareness materials and sending emails to request support services.

d. Inquiry-based learning

Teachers pose a thought-provoking question related to ICT concepts or skills and encourage learners to engage in independent thinking. Learners can be further stimulated to ask questions and investigate ideas using the Internet to enhance their problem-solving skills and gain a deeper understanding of the concept. For example, learners can be asked how cyberbullying could be prevented.

e. Interdisciplinary approach

ICT is an effective tool to enhance learners' knowledge and teachers must take the opportunity to integrate the teaching of ICT tools into the learning of concepts in other subjects. For example, learners can be introduced to the features of the Internet by encouraging them to search for content on English grammar and showing them how to download or bookmark it for future use. In Science, learners can

create a report using MS word application on the life cycle of butterflies to learn the features of Microsoft Word.

f. Online and blended learning

Teachers use multiple online platforms to engage learners after school hours to continue learning ICT skills and concepts. Learners perform independent learning using technology and report on their understanding in class or through comments and discussions in the online forums. For example, learners explore any online writing and share their learning in class the next day or through the online class forums.

7. ASSESSMENT AND REPORTING

Assessment is an integral part of learning, as it provides ongoing feedback necessary for effective teaching and learning. It is the process of gathering evidence of learning, usually in measurable terms, concerning knowledge, skills, and attitudes. Gathering evidence of learning requires the use of a variety of assessment methods to assess learners' products and performances during and after the learning. The evidence of learning informs instruction by providing information about the learning progress to the learner, the teacher, and the parent. The goal of assessment ultimately is to develop self-directed learners who regularly monitor and assess their progress.

Assessment is divided broadly into two categories: formative and summative. Summative assessment takes place at the end of the learning process and summarizes the development of learners at a particular time. Formative assessment, on the other hand, is a range of formal and informal assessment methods used during the learning process, usually by teachers. It helps to influence teaching methods and priorities and to modify teaching and learning activities while monitoring what learners know for improving their achievements. The assessment of learners with vision impairments must be adapted and modified to suit the individual learner's needs and abilities.

One of the important objectives of this ICT curriculum is to equip our learners with 21st century skills, and the formative assessment is understood to be a central feature of the learning environment of the 21st century (Harrison, 2014). 21st century learners need substantial and meaningful feedback regularly to assess their progress and influence future lessons and teaching strategies. Thus, the assessment of learning in this curriculum lays more emphasis on formative assessment than summative assessment. The assessment in Key Stage I will focus on Continuous Formative Assessment (CFA) where there will be no term examinations and formative assessment will be undertaken throughout the year. The assessment approaches used must ensure that the learners with vision impairments are not excluded from the learning process, be it in special institutes or inclusive settings.

The assessment of learning in the ICT curriculum is based on the evidence of learning, which is examined through the following four ways:

1. Observation

Focused observation of learning identified in the objectives is critical to accurately describe the learning of a particular learner. As in other subjects, focused observation of learners engaged in learning needs to be anecdotal and done often and over time. Teachers need to regularly observe the learning outcomes in lessons to determine the growth in the learner's learning. Taking descriptive notes on the learner's achievement of an outcome is useful in providing the context of each learning situation such as specific successes, difficulties encountered, or behaviours observed.

Achievement of a learning objective based on the assessment criteria must be seen in the context of whether the behaviour or skill observed is consistent and whether there is progress.

2. Conversation

Conversations with teachers or between learners during or after the learning process allow the learners to reflect and evaluate their learning. Teachers also get to identify learners' strengths and weaknesses for appropriate intervention or for reporting to their parents. Conversation as an assessment strategy provides learners with an opportunity to "experience their successes and failures not as reward and punishment but as information" for reflection (Jerome Bruner,xx).

Observations and conversations for learning in ICT are often used together to set learning goals, provide descriptive feedback, and put appropriate interventions to complete a learning activity. Descriptive but specific feedback provides intrinsic motivation for learners to improve their learning and enjoy their learning.

3. Digital artefacts

Digital artifacts are documents or multimedia files that are electronic evidence of learners' learning. They are critical to demonstrate evidence of learning, especially in the context of performing authentic tasks. An authentic task refers to an assignment that requires applying knowledge and skills to real-world challenges such as creating a report in MS Word.

At the core of performing authentic ICT tasks is making knowledge visible, a concept that is central to constructivist learning theory. Constructionism states that learning occurs felicitously when constructing or creating a public artefact. Teachers can observe and provide descriptive feedback on artefacts which will further necessitate learners to try to solve a problem and learn because they are motivated by their construction.

4. Testing

Testing at a regular interval such as at the end of a chapter, term or year provides feedback to teachers on the progress of learners' learning. Both practical and theory tests are recommended to holistically check how learners are performing in terms of their understanding and application of knowledge, values, and skills.

Practical testing will require computers, relevant software applications, and Internet connectivity for learners to explore and create digital contents. Theory testing can be conducted using alternate forms of assessments suited to the needs of learners with vision impairments. The use of adaptive devices and technology such as screen readers, screen magnifiers, and enlarged font sizes, must be facilitated for the assessment. These tests should usually be carried out at regular intervals over the academic year.

For learners with vision impairments, appropriate accommodations in setting, timing, response, and representation must be ensured as necessary. The assessment rubrics, criteria and methodology must be adapted considering the needs, abilities, and learning contents appropriate for the learners with vision impairments. Teachers can refer to the Key Stage-wise Assessment Matrix given in *Appendix-I* for detailed assessment area, assessment mode, and weighting for each key stage.

8. ENABLING CONDITIONS

ICT plays a key role in preparing learners to live and work successfully in a knowledge-based society. With the world moving rapidly into digital media and information, schools have realised the importance of digital competence for learners. The effectiveness and success of this curriculum hinge on critical enabling conditions that must be in place or ensured as the implementation begins. The following five enabling conditions are identified as critical in the successful implementation of the ICT curriculum.

a. Adequate infrastructure & Assistive technology and devices

The ICT curriculum focuses on what learners can do which necessitates providing hands-on learning for which smartphones and other special technological devices/gadgets/software/applications remain essential for learning. Computer laboratories equipped with adequate computers form a prerequisite for the successful implementation of the curriculum. With the use of authentic tasks in the form of mini-projects, learners require enough computer time to practise skills and complete projects.

b. Competent teachers

Delivery of ICT curriculum intentions in schools largely depends on the competency of ICT teachers. Teachers should be competent in imparting functional and foundational ICT knowledge and skills with the use of assistive technologies such as screen readers and screen magnifiers. Additionally, the teachers should be able to provide authentic tasks that require learners to apply ICT skills and values in completing the tasks.

ICT teachers must be supported through regular professional development programmes including emerging technologies to achieve the curriculum intentions and outcomes. The professional development programmes to enhance the competency of ICT teachers may be carried out either at Dzongkhag or national levels depending upon the degree and nature of training required.

c. Reliable Internet connectivity

Given the enormous learning opportunity the Internet provides through access to unlimited resources and information, learners must have the opportunity to use the Internet for learning concepts and topics on ICT as well as other subjects. The Internet also provides a platform for learners to communicate and collaborate on projects with the use of ICT tools.

For this, schools must have fast and high bandwidth Internet connectivity. It has been often mentioned that unreliable Internet connectivity can negatively affect learner's experience with technology and consequently their learning.

d. Enrichment activities

ICT events such as hackathons, bootcamp, Olympiads, exhibitions and competitions provide enriching avenues for learners to apply their ICT knowledge and skills learned in schools. Participating in ICT events will enrich learners' experience and knowledge in creating innovative ICT solutions.

There is a need to initiate regular ICT events at the school and national levels to motivate learners to create innovative ICT solutions and even participate in international events. Without opportunities for enrichment events, learning will remain within the confinement of classrooms, unable to apply their ICT skills in real-world contexts.

e. Enhanced learning support

Regular maintenance of computers and networks is essential for a smooth ICT learning experience for learners. ICT laboratory assistants in the schools are the key people to ensure that the computers and networks are always functional. Without functioning computers and networks, much of the curriculum outcomes will remain unachieved. Therefore, schools must have competent ICT laboratory assistants and some budgetary provisions to maintain the computers and networks.

9. CROSS-CURRICULAR LINKAGES

Technologies can transform the way learners think and learn as they support self-exploration, team collaboration, content creation and knowledge sharing. Since technologies are fast, automated and interactive, it allows learners to control how and when they learn. ICT can be used by teachers to enhance learners' learning experience and improve their performance in all subjects.

The ICT curriculum can be integrated smoothly into other subjects to stimulate and extend learning. For this, teachers need not have to teach the ICT curriculum but can provide opportunities for learners to apply the ICT skills that they have already learned in the ICT subject. Accordingly, the focus of the lesson must remain firmly rooted in learning the subject's content, and teachers should not be burdened with the need to teach ICT skills separately. Subject teachers should also have a good understanding of the breadth of ICT skills and concepts that learners have been taught and know which ICT tools offer significant opportunities to enhance teaching and learning and how they can be incorporated into their subjects effectively.

For the delivery of the ICT curriculum, ICT teachers can link the ICT tools and concepts to other subjects wherever relevant and possible. This can add value, excitement and fun to the subjects learned through the use of ICT. For example, primary learners can transform a story learned in English into an accessible digital format. In creating the digital story, learners will get the opportunity to apply ICT skills. Similarly, there are many opportunities for both ICT teachers and other subject teachers to integrate ICT skills and concepts that learners learn through this curriculum. Given below are some examples of how learners can use skills learned in the ICT curriculum to learn other subjects.

English:

- Writing letters, journals and reports in MS Word for field trip projects.
- Enrolling in online courses to learn grammar and creative writing.
- Recording audio in the recorder and playing it to improve speaking.
- Sending emails to education officials to enquire about winter programmes.
- Making a presentation using PowerPoint for a reading or writing project.
- Researching popular poets and writers using Internet search techniques.

Dzongkha:

- Typing in Dzongkha to compose an essay for competition.
- Presenting using MS PowerPoint on *Driglam Namzha* (etiquette) in school.
- Recording *Tsangmo* and *Lozay* in an audio recorder for remixing and adding music.
- Creating video on short Dzongkha drama and sharing with friends for feedback.
- Searching the Internet for images required for Dzongkha projects.

Mathematics:

- Data analysing and graph drawing in MS Excel.
- Watching videos on the Internet to learn algebra.
- Playing Mathematics simulations on the Internet.
- Drawing Mathematical shapes and patterns in MS Paint.

Geography:

- Using Google Map to locate countries and places.
- Searching the Internet for geography projects.
- Creating a poster in MS Paint on climate change.

History:

- Using the Internet to research historical figures.
- Creating video presentations on a historical site in Bhutan.
- Writing a report using MS Word on a field trip to a Dzong.
- Recording audio of an interview of a politician or local leader.

Science:

- Watching online videos on science experiments and exhibitions.
- Creating a presentation on 'water cycle'.
- Exploring PhET interactive simulations on advanced science concepts.
- Designing posters on great scientists and their inventions.

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11. APPENDIX

APPENDIX I - KEY STAGE-WISE ASSESSMENT MATRIX

Sl #	Assessment Area	Mode	Classes PP-III	Classes IV-VI	Classes VII-VIII	Classes IX-X	Classes XI-XII
			Weighting %	Weighting %	Weighting %	Weighting %	Weighting %
1	Participation and completion of classwork. (face-to-face or online) *(Formative assessment)*	Observation, Conversation	10	10	10	10	10
2	Participation and completion of homework. (face-to-face or online) *(Formative assessment)*	Observation, Conversation	10	10	10	10	10
3	Planning, research, documentation, creation and presentation of digital artefacts. *(Formative assessment)*	Assessment of Digital Artefacts	80	60	50	40	30
4	Theory and/or Practical Test (unit, mid-term and annual exams) *(Summative assessment)*	Testing	0	20	30	40	50
Total			**100**	**100**	**100**	**100**	**100**

Curriculum adaptation team:

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6	Wangchuk	CD	SCD, DSE, MoESD
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19	Dorji Phuntsho	Teacher	Rangjung HSS
20	Dorji Phuntsho	DPOB	DPOB
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