

National School Curriculum

INSTRUCTIONAL GUIDE FOR ICT

CLASS: IV-VI



Department of Curriculum and Professional Development
Ministry of Education, 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 for the nation. I congratulate you for 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

The erstwhile Royal Education Council (REC) developed an Adapted and Prioritized curriculum for schools so that students can continue learning during the disruptions caused by the COVID 19 pandemic since March 2020. With the commencement of the 2021 academic session, the new normal curriculum, later renamed as the National School Curriculum (NSC), was embraced as a paradigm shift of education from conventional knowledge-based learning to competency-based, open-source and experiential learning leveraged on digital technologies. In order to facilitate the effective implementation of the curriculum change, Instructional Guides were developed in all subjects, and the teachers were oriented through virtual and short contact modes as per the prevailing pandemic situations. The curricula were aimed at minimizing the learning loss for learners as it was designed for implementation in different situations - during school closure or during regular contact instructional hours.

While these measures served as a solution to problems brought about by the pandemic and the global changing trend in education, resilient and more dynamic curricula and instructions remain the current priority of the Government. In cognizance of some of the shortfalls in the provisional edition of Instructional Guides (IG), the Department of Curriculum and Professional Development reviewed and revised the existing Instructional Guides across all subjects with the aim of enforcing the competency-based learning, and making teaching-learning happen ‘anytime anywhere’ commensurate to inclusive education so that all learners are provided with the opportunity to learn at their pace and situation.

The revised Instructional Guides have drawn ideas and inspiration from various educational philosophies and principles, particularly the Delors Report, *Learning: The Treasure Within* (1996). The report prioritizes the development of the whole person and not just academic knowledge through the four pillars: “learning to know”, “learning to do”, “learning to be”, and “learning to live together”. Therefore, the New Curriculum and the Instructional Guide is an attempt to transform education from the teaching of “what” to learning of “how” and “why” towards empowering learners with the transversal competencies and the 21st century skills and preparing them to be lifelong learners.

It must be noted that the New Curriculum and the Instructional Guide are not just a response to the pandemic, but a culmination of the curriculum reform work for the last four years by the

Department of Curriculum and Professional Development. The school curricula are to be perceived as integrated and based on themes and problems that inspire learners to learn and to live in peace with our common humanity and our common planet. This has the potential for the development of a strong base of knowledge about one's self and about the world, finding the purpose of learning, and being able to participate in the social and political milieu. Thus, this initiative is envisaged to orient our educational process toward nurturing 'nationally rooted and globally competent citizens.

Wish all our learners and teachers life-enriching teaching and learning.

Tashi Delek

A handwritten signature in black ink, appearing to read 'Tashi Namgyal', with a horizontal line drawn underneath it.

Tashi Namgyal

Director

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Introduction

The National School Curriculum for the Information and Communication Technology (ICT) was developed for implementation in schools from the 2021 academic year. One significant change in the curriculum frameworks is the shift of focus from academic standards to competencies. Over the years, standards-based education has become a means of measuring content coverage and test readiness. The shift to competency-based education is aimed at developing and applying competencies - knowledge, skills and dispositions - to new and challenging situations. It emphasizes mastery of competencies to help our students successfully navigate their personal journeys in learning, living and working.

In school, students develop and apply ICT competencies through ICT subject-area content and learning experiences which provide opportunities for them to transfer their learning to situations and contexts even beyond the classroom. This shift permeates across the curriculum, pedagogy and assessment, and for this change to make a difference in learning, deliberate attempts must be made in all three aspects.

This instructional guide for the ICT curriculum is conceived with two objectives. The first purpose is to provide examples of how pedagogy and assessment are designed to help students develop the required ICT competencies. It also includes examples of curated online resources that can be used as reference materials for teachers, learning resources for students or assessment tools for use by teachers. The second purpose is to provide a reference for ICT teachers to facilitate the delivery of online lessons during emergencies. The guide contains distinct examples of pedagogy and assessment for non-contact online teaching.

The pedagogy, assessment and resources mentioned for every competency for all class levels are only meant to be suggestive. Teachers are encouraged to modify them, use innovative strategies or create new lessons that are relevant to their students and situations, and can help students develop and master the required competencies.

A salient feature of the guide is the conscious integration of ICT in teaching and learning. This may be in the form of blended learning during normal school settings, or fully online teaching during emergencies such as the current pandemic. The curated digital resources provided in the guide can be applied to both blended learning and online teaching depending on the instructional approach being used by the teacher

Purpose of the Instructional Guide

The content in the instructional guide is aligned with the competencies and topics provided in the National School Curriculum for ICT. The instructional guide comprises competencies, topics, learning experiences, assessments and resources that will facilitate teachers to successfully deliver the ICT curriculum. Using a competency and corresponding topic as the pivot, learning experiences and assessments are written towards achieving the competency.

Learning experiences provide suggestive strategies and pedagogies for the delivery of the listed competencies. It has both contact and online teaching strategies. Contact teaching refers to a situation when schools are open, and teaching and learning take place face-to-face in a classroom. Teachers can apply a blended teaching approach for meaningful ICT integration and delivery of lessons. Online teaching refers to a situation where teaching and learning happen online during school closures due to emergencies like pandemics. In such a situation, teachers need to consider relevant pedagogies that are supported by technologies such as the ones given below:

1. Choose an online learning platform such as Google Classroom, Sherig LMS (under development), WeChat, WhatsApp, Telegram, etc. considering the ease of use and appropriateness of the tool for the students. This platform is to be used as a virtual classroom for presentations, discussions, sharing resources, assigning tasks, and assessment of learning.
2. For lesson delivery by teachers, consider the use of video conferencing tools such as Zoom and Google Meet for synchronous teaching, and creation tools such as Microsoft PowerPoint and Camtasia for asynchronous teaching.
3. For assessment purposes, consider the use of tools such as Google Forms and Kahoot to create quizzes, Google Docs, Google Sheets and Google Drawings in Google Classroom to assign tasks for students.
4. For the recording of student performance, consider the use of the grading feature in Google Classroom or spreadsheets such as Google Sheets and Microsoft Excel. The scores from these sources can be transferred to the student progress report as per the assessment criteria.

Suggestive pedagogies, assessments and resources for each competency are listed below. Teachers are advised to refer to the instructions given therein for their lesson planning and effective delivery of the ICT lesson to the learners.

Class Four

Students will be able to:

1. identify key components of the internal hardware to understand and appreciate the working of a computer.
2. produce a formatted word document for their class project works.
3. gather relevant information from the Internet to identify and appreciate how technology has positively changed our lives.
4. demonstrate correct body posture while using different devices and adopt proper settings in the workplace for safety, health, and productivity.
5. create animations and stories with multiple characters and objects using a block programming tool to display creativity and enhance coding skills.

STRAND A – Technology Operation

1. COMPUTER HARDWARE

Computer hardware is the physical component that a computer system requires to function. While the software is required to make hardware useful, without the correct hardware some software may not run properly or even at all. Both hardware and software are critical parts of a computer.

Under this topic, students will learn about external and internal hardware components in a computer system. They will be able to identify the motherboard, RAM, hard disk, power supply units, network interface cards and other internal components of a computer system. With this, students will understand how a computer works and know what are the key hardware components required to run a computer.

COMPETENCY 1: Students will be able to identify key components of the internal hardware to understand and appreciate the working of a computer.

Topics	Key Stage Standard	Objectives	Time
Internal Hardware <ul style="list-style-type: none">• Definition of internal hardware.• Differentiate between internal and external hardware• Functions of different internal hardware components. (motherboard, Processor, RAM, Hard drive, Power Supply Unit, Network Interface Card) Working of a Computer <ul style="list-style-type: none">• Introduction to IPO cycle• Examples of IPO process	A2.1 Explain the working of a computer.	4-A2.1.1 Explain the functions of basic internal hardware components. 4-A2.1.2 Explain the working process of a computer.	160 mins (4 periods)

Learning experiences:

- Make a PowerPoint presentation to explain internal hardware with examples. Show pictures of different internal hardware and discuss the function of each component.
- Let students identify the available devices around them in the classroom. Ask them to compare those components with the internal hardware. Then discuss the differences between internal and external hardware.

- Introduce and relate the IPO cycle with daily life examples such as the process of preparing tea or washing clothes in a washing machine. Let students categorize computer devices into input, output and process.
- Display pictures of different computer devices and let students discuss their functions and categorize them into input, output and process.
- Conduct video conferences to explain the functions of different internal hardware. Discuss common features of that hardware and define internal hardware.
- Provide worksheets to students containing lists of hardware components. Ask students to categorize the devices into internal and external hardware devices.
- Create and share videos to introduce and relate the IPO cycle with daily life examples such as the process of preparing tea or washing clothes in a washing machine. Let students categorize computer devices into input, output and process.
- Share weblinks having videos, pictures or animations on internal computer hardware and IPO cycle in the class online platform. Let students go through the materials and complete tasks.

Assessment:

- Ask questions to students on the differences between internal and external hardware with examples.
- Provide worksheets containing pictures of different hardware devices. Ask students to categorize into internal or external hardware.
- Conduct class tests on IPO cycle, hardware and their functions. Maintain proper records to keep track of their learning.
- Let students explore and present real-life examples of the IPO cycle.
- Observe students' activities and keep records of their work. Provide necessary support and feedback.
- Create and conduct quizzes in the classroom on internal hardware and IPO cycle using online assessment tools such as Google Forms, Kahoot and Triventy.
- Evaluate worksheets on internal hardware and IPO cycle submitted by students through the class online platform.
- Ask students to describe the Input, Process and Output cycle with examples and submit it through an online platform.
- Create and share quizzes on internal hardware and IPO cycle using online assessment tools such as Google Forms, Kahoot and Triventy.
- Maintain a record of tasks submitted by students on computer hardware and IPO cycle.

Questions:

1. Explain the IPO cycle of the computer.
2. How is internal hardware different from external hardware?
3. List some of the important internal hardware components and write their functions.

Resources:

1. **Internal and External Hardware:** The weblinks explain about internal and external hardware of the computer.
 - <https://www.youtube.com/watch?v=SSnNY8GfZig>
 - https://www.youtube.com/watch?v=3vSnVvtv_PQ
 - <https://www.youtube.com/watch?v=HB4I2CgkcCo>
2. **IPO Cycle:** The weblinks contain information on IPO cycles with real-life examples.
 - <https://www.youtube.com/watch?v=B9Sr6yy-z24>
 - https://prezi.com/r_7shjtf0xk0/ipos-cycle/
 - <https://www.youtube.com/watch?v=CBBap6fzpOo>
 - [Sample3.pdf \(mjpgedesign.com\)](#)
 - <https://lessonplan.edudelight.com/computer-as-ipo-system/>
 - <https://www.snblogs.com/input-processing-output-cycle/>
3. **Literacy with ICT Textbook:** The weblink contains class V Literacy with ICT Textbook. Teachers may refer to chapter one of the textbook on computer hardware and software.
 - <https://rec.gov.bt/textbooks-and-manuals/#683-902-wpfd-ict-1586092614>

2. DOCUMENT FORMATTING

Document formatting refers to the way a document is laid out on the page. Formatting a document is about setting the way it looks and is visually organised by the formatting of font, spacing, margins, alignment, columns, indentations, and list. A well-formatted document is consistent, correct, and easy to read.

Under this topic, students will be able to use MS Word to design and develop a well-formatted document that is relevant to the subjects they are studying. They will use formatting tools in MS Word to produce documents such as reports, essays, letters, and stories. Students will also write in Dzongkha and produce documents in Dzongkha with the support of Dzongkha teachers. Students' experiences in working on word processing tools will help them develop skills to produce digital documents both in English and Dzongkha.

COMPETENCY 2: Students will be able to produce a formatted word document to present their work.

Topics	Key Stage Standard	Objectives	Time
Formatting a Document <ul style="list-style-type: none"> Character formatting <ul style="list-style-type: none"> font size, color, type, effects Paragraph formatting <ul style="list-style-type: none"> paragraph alignment line and paragraph spacing, indentation Typing in Dzongkha 	A2.2 Create a formatted document using a word processor.	4-A2.2.1 Apply text formatting features to enhance word processing documents.	280 mins (9 periods)

Learning experiences:

- Demonstrate character and paragraph formatting in Microsoft Word to students. Let them follow the steps to format the Word document.
- Provide a sample formatted document in a hard copy to students. Let students type the text and apply formatting to produce a Word document as given in the sample document.
- Ask students to type a leave application in Microsoft Word. Encourage students to seek help from English teachers and produce a Word document by applying appropriate formatting properties.
- Ask students to write a leave application in Dzongkha and encourage them to seek help from Dzongkha teachers. Let them type the application in Microsoft Word and apply appropriate formatting.
- Create and share videos on how to format documents in Microsoft Word. Ask students to type a paragraph in Microsoft Word and follow the steps to apply text formatting.
- Provide a sample formatted word document to students. Let students type the text and apply formatting to produce a word document as given in the sample document. Let students submit it through the class online platform.
- Ask students to type a leave application in Microsoft Word. Encourage students to seek help from their parents and produce a Word document by applying appropriate formatting properties.
- Ask students to write a leave application in Dzongkha and encourage them to seek help from their parents. Let them type the application in Microsoft Word and apply appropriate formatting.

Assessment:

- Monitor students' activity in formatting Word documents. Observe and keep records of their ability to format the document. Provide timely support and feedback.
- Evaluate project on typing leave application in English and Dzongkha. Provide necessary feedback and reinforcements.
- Evaluate and keep records of formatted documents submitted by students through the class online platform. Provide necessary feedback.
- Keep a record of tasks submitted by students through the class online platform.

Questions:

1. How is a well-formatted Word document different from a handwritten document?
2. What are the advantages and challenges of using MS Word to create documents?
3. What types of documents have you created so far using MS Word? Which one is your best document? why?
4. What type of Dzongkha document did you create using MS Word?
5. What did you like about using Dzongkha in MS Word?

Resources:

1. **Formatting Document:** The weblinks explain the character and paragraph formatings in Microsoft Word.
 - <https://www.wikihow.com/Format-a-Word-Document>
 - <https://edu.gcfglobal.org/en/word/formatting-text/1/>
 - <https://thesoftwarepro.com/microsoft-word-formatting/>
 - https://youtu.be/ZDF3-9e_7tA
 - <https://youtu.be/7k2bKVxcEV0>

STRAND B – Communication and Collaboration

3. BENEFITS OF INTERNET

The Internet is one of the powerful platforms that offers endless information to people around the world. The Internet plays a critical role in many areas ranging from education, entertainment, commerce, health, military, and others. Even though there are risk and dangers associated with using the Internet, the benefits of the Internet is also enormous. The Internet has become a part of modern life and using the Internet has transformed the way we communicate, work, and live on day to day basis.

Under this topic, students will be able to identify various fields in which the Internet has brought positive changes over the years. They will be able informed about the ISPs in Bhutan and how

they provide Internet services across Bhutan. Students will also be able to search for information on the benefits of the Internet to individuals and society and present their findings to the class.

COMPETENCY 3: Students will be able to gather relevant information from the Internet to identify and appreciate how technology has positively changed our lives.

Topics	Key Stage Standard	Objectives	Time
Benefits of Internet <ul style="list-style-type: none"> • Definition of Internet • Examples of ISP • Benefits of the Internet - business, banking, entertainment, education, medicine, etc. • Search information on Internet 	B2.1 Manages relevant links using a browser.	4-B2.1.1 Explain the benefits of using the Internet.	120 mins (3 periods)

Learning experiences:

- Make a PowerPoint presentation to explain the impacts of the Internet. Ask students to share their views on life without the Internet.
- Explain how to access the Internet in school or at home. Discuss with students about the basic requirements for connecting to the Internet.
- Ask students to explore the Internet and search for information on the benefits of the Internet. Let them write it down on a chart paper and present it to the class.
- Conduct video conferences to discuss the advantages and disadvantages of the Internet. Ask students to share their views on how the Internet has helped them in learning.
- Create and share video lessons on how to access the Internet in school or at home. Let students explore the Internet and find out the basic requirements for connecting to the Internet.
- Ask students to explore the Internet and search for information on the benefits of the Internet. Let them write down in their notebook, take a picture and submit it through the class online platform.

Assessment:

- Ask questions to students on the benefits of the Internet in our daily life.
- Evaluate students' work on the benefits of the Internet written on the chart paper.
- Divide students into two groups and conduct a debate competition on the impacts of the Internet. Assess students based on the criteria.

- Create and conduct quizzes in the classroom on the benefits of the Internet using online assessment tools such as Google Forms, Kahoot and Triventy.
- Evaluate tasks submitted by students on the benefits of the internet through the class online platform.
- Conduct online quizzes on the benefits of the Internet using appropriate online tools.
- Let the students share how the internet has benefited them in their day to day activities through the online class platform.

Questions:

1. What are the benefits of using the Internet?
2. How has the Internet helped you as a student to improve your knowledge and skill?
3. In groups, make a presentation on the benefits of the Internet in education.
4. How many Internet Service Providers are there in Bhutan? Which ISP provides the Internet service to your school?
5. How do you store or save online information for future references?

Resources:

1. **The Internet:** The weblinks contain information about the Internet and its benefits.
 - <https://www.computerhope.com/issues/ch001808.htm>
 - <https://www.computerhope.com/issues/ch001810.htm>
 - <https://dgaps.com/advantages-disadvantages-of-internet-53>
 - <https://edu.gcfglobal.org/en/internetbasics/what-is-the-internet/1/>
 - <https://www.javatpoint.com/internet>
 - <https://www.youtube.com/watch?v=IH6WGOYdQ3k>
 - https://www.youtube.com/watch?v=O8TDFD_BpUw
 - <https://www.youtube.com/watch?v=q12JRWXJEwY>
 - <https://www.youtube.com/watch?v=VBKa9Ay8ebs>
 - <https://www.youtube.com/watch?v=J8hzJxb0rpc>
 - <https://youtu.be/Dxcc6ycZ73M>
2. **Connecting to the Internet:** The Weblinks explains how to connect to the Internet.
 - <https://edu.gcfglobal.org/en/computerbasics/connecting-to-the-internet/1/>
 - <https://www.wikihow.com/Connect-to-the-Internet>
 - <https://www.computerhope.com/issues/ch000720.htm>
 - <https://www.youtube.com/watch?v=UXsominDkntI>
3. **Safety Tips:** The weblinks provides safety tips while using the Internet
 - <https://www.youtube.com/watch?v=X9Htg8V3eik>
 - <https://www.youtube.com/watch?v=W7FOk1-Jzus>

STRAND C – Safety and Ethics

4. COMPUTER ERGONOMICS

Computer ergonomics refers to improving computer design and workspace arrangements to reduce strains, fatigue and injuries to the users. It will help to ensure a comfortable and relaxed posture while using computers.

Under this topic, students will be able to understand the benefits of the following computer ergonomics for safety and productivity. They will practice some good body postures and arrangement of furniture while using computers. Further, they will also take initiative to inform others about the benefits of computer ergonomics through presentations and posters.

COMPETENCY 4: Students will be able to demonstrate correct body posture while using different devices and adopt proper settings in the workplace for safety, health and productivity.

Topics	Key Stage Standard	Objectives	Time
Computer Ergonomics <ul style="list-style-type: none">• Definition of computer ergonomics• Benefits of ergonomics• Correct body postures for different devices• Ways to prevent health issues brightness settings, screen time, break, short exercises, etc.• Examples of proper workplace setting	C2.1 Follow correct ways to prevent computer-related health issues.	4-C2.1.1 Follow computer ergonomics to prevent health issues. 4-C2.1.2 Follow correct body postures for different devices.	160 mins (4 periods)

Learning experiences:

- Make a PowerPoint presentation to explain computer ergonomics and its benefits. Let students adopt strategies to improve ergonomics.
- Demonstrate the correct posture for different devices and explain the benefits of correct body posture. Let students practise correct body posture and encourage them to follow it while using different devices.
- Discuss measures to prevent health issues while using computers. Let them write it down in their notebook and encourage them to follow it.

- Create and share PowerPoint presentations to explain computer ergonomics and its benefits. Ask students to explore the Internet and find out strategies to improve ergonomics.
- Make videos on maintaining proper body posture while using different devices and send them through the class online platform. Ask students to adopt correct body posture to reduce health impacts.
- Share weblinks on measures to prevent health issues while using the computer. Ask students to follow appropriate measures to prevent computer-related injuries.

Assessment:

- Observe students' body posture during activities and provide necessary guidance.
- Let students explore the Internet and find out about possible computer-related health issues and ways to prevent them. Let them present it in the class.
- Create and conduct tests on computer ergonomics and ways to prevent computer-related injuries using online assessment tools such as Google Forms, Kahoot and Triventy.
- Let students explore the Internet and find out about possible computer-related health issues and ways to prevent them. Let them share it through the class online platform.
- Let students search for pictures of correct body postures for different devices from the Internet and submit them through the class online platform.
- Create and share online tests on computer ergonomics and ways to prevent computer-related injuries using online assessment tools such as Google Forms, Kahoot and Triventy.

Questions:

1. What are the benefits of following proper body posture while using the computer?
2. How should you set up your computer at school or home in order to have minimum impact on your health?
3. Make a list of things you want to do to minimise the health issues related to the use of computers and mobile devices.

Resources:

1. **Computer Ergonomics:** The weblinks explain computer ergonomics and how we can improve it to reduce health impacts.
 - <https://www.youtube.com/watch?v=Ree1CWifQTg>
 - shorturl.at/uPRY9
 - <http://comp1220uwigroup.weebly.com/ergonomics.html>
 - <https://www.allaboutvision.com/cvs/ergonomics.htm>
2. **Correct Body Posture:** The weblinks explain about benefits of correct body posture to reduce health impacts.

- <https://www.quill.com/blog/lifestyle/benefits-of-having-great-posture-at-work-and-how-to-improve-bad-posture.html>
- <https://youmatter.world/en/the-importance-of-adopting-a-good-posture-at-work-and-tips-on-how-to-do-it/>
- <https://www.h-wave.com/blog/why-good-posture-matters-and-bad-posture-can-hurt-your-health/>

3. **Preventing Computer Related Health Injuries:** The weblinks explains computer-related health issues and ways to prevent ourselves from such problems.

- <https://www.betterhealth.vic.gov.au/health/healthyliving/computer-related-injuries>
- <https://myva360.com/blog/10-common-computer-related-injuries-and-how-to-prevent-them/>
- <https://www.coeh.berkeley.edu/post/2018/08/06/7-crucial-steps-to-protect-yourself-from-computer-injuries>
- <https://www.youtube.com/watch?v=uSBakWOsYdA>
- <https://www.youtube.com/watch?v=jqvtImP7CTE>

STRAND D – Coding

5. SCRATCH ANIMATION

Scratch is a visual programming language that allows students to create their own interactive stories, games and animations. Scratch helps students to think creatively, reason systematically, and work collaboratively. Scratch was created by the Lifelong Kindergarten group at MIT Media Lab and is available for free.

Under this topic, students will use different coding blocks in Scratch such as sound, looks, motion, events, and others to create simple stories, animations and games. Students will insert characters and add movements or interactives to make Scratch animations interesting and meaningful. The projects on Scratch can be based on local stories and games to bring local context into learning to code.

Developing games, stories and animations in Scratch is a great way for students to learn basic programming concepts such as variables, Boolean logic, loops, and more. Students learn the basic principles of computer programming by creating new games and stories, and at the same time learn to become critical, creative and innovative.

COMPETENCY 5: Students will be able to create animations and stories with multiple characters and objects using a block programming tool to display creativity and enhance coding skills.

Topics	Key Stage Standard	Objectives	Time
Animation in Scratch <ul style="list-style-type: none"> Costumes and Backdrop <ul style="list-style-type: none"> Paint, Upload Sound <ul style="list-style-type: none"> Record, upload, choose Looks block <ul style="list-style-type: none"> set size switch costume switch backdrop Motion block <ul style="list-style-type: none"> go to, change x by (), change y by (), point in direction, point towards Sound block <ul style="list-style-type: none"> play, start Control block Event <ul style="list-style-type: none"> when key pressed, when this sprite clicked, broadcast Sensing 	D2.1 Create an animation using block programming	4-D2.1.1 Customize characters and backgrounds based on a theme.	1600 mins (40 periods)
	D2.2 Develop an advanced interactive project using block programming.	4-D2.1.2 Change coordinates to move characters.	
		4-D2.1.3 Add appropriate in-built multimedia based on a theme.	
		4-D2.2.1 Control the behaviour of multiple characters.	

Learning experiences:

- Demonstrate steps to customize sprite, backdrop and sound in Scratch. Instruct students to develop a project using customized elements.
- Let students develop animations by manipulating the coordinates in Scratch. Encourage students to use customized sprites and backdrops, and to add sound whenever necessary.
- Provide a video on Scratch animation to students in groups and make them discuss and write algorithms to complete the project. Let them develop a theme-based project.
- Divide students into groups. Show them the output and provide them with an incomplete project. Let them discuss, analyse and debug the program to complete the project.
- Show an example of projects that use multiple sprites in animation and also control their behaviour using events and sensing blocks. Then let students discuss and create algorithms to create an interactive project.
- Let students explore arts by creating projects that include elements of music, design, drawing, stories, and dance. Ask students to present their projects in the class.
- Provide project ideas that incorporate concepts learned in other subjects. Let students discuss with peers and develop a project that expresses their ideas, creativity and learning.

- Conduct video conferences to teach and discuss customizing sprite, backdrop and sound in Scratch. Let students create an animation that involves interaction between multiple characters and add appropriate multimedia elements.
- Create and share video lessons about using coordinates to animate characters in Scratch. Ask them to develop algorithms and create interactive projects in Scratch.
- Provide weblinks for tutorials on customizing elements in Scratch, manipulating coordinates to animate multiple characters and developing interactive projects. Encourage students to visit the Scratch community to communicate and collaborate with others to develop a project.
- Provide the list of project ideas in Scratch to the students. Let students choose the topic of their interest and develop a project to express their ideas in a creative manner.

Assessment:

- Assign projects on animating multiple characters or developing interactive projects to students individually or in groups, and assess them based on the rubrics.
- Conduct practical tests to evaluate individual students' learning on creating interactive animations in Scratch.
- Present students with different sample projects and ask students to select one of the projects. Let students explain what the selected project does, describe how it could be extended, fix a bug, and remix the project by adding a feature.
- Monitor students' involvement in discussions with peers or with the teachers.
- Maintain records of projects on animations and interactive projects submitted by students.
- Conduct video conferences to confirm students' learning on Scratch and provide the necessary support.
- Create and share online tests on Scratch using online assessment tools such as Google Forms, Kahoot and Triventy.

Questions:

1. What is the process of creating a simple animation in Scratch?
2. How does Scratch programming help you to improve your thinking and problem-solving skills?
3. From the animations that you created in Scratch, which is the best one and why?
4. How do adding the costumes, sounds, backdrop and changing the looks help to improve the quality of your animations?
5. What are some of the challenges you faced in creating animations in Scratch? How do you intend to overcome these challenges?
6. Differentiate the animation you created in Scratch from the animation you see in movies.

Resources:

1. **Scratch Guide:** The weblinks contain guides on programming in Scratch. The link can be shared with students to explore and derive project ideas.
 - [Getting-Started-With-Scratch-3.0.pdf \(mit.edu\)](#)
 - https://en.scratch-wiki.info/wiki/Getting_Started_with_Scratch
 - <https://scratch.mit.edu/ideas>
 - <https://brainbasket.org/en/free-scratch-lessons/>
 - <http://scratch.redware.com/lessonplan>
 - <https://sites.google.com/a/googleapps.wrdsb.ca/hour-of-code/primary-scratch-lessons>
 - <http://umaine.edu/computingcoursematerials/wp-content/uploads/sites/511/2016/12/ScratchWorksheetsCompilation.pdf>
 - [Programming Basics: Programming Games in Scratch](#)

Class Five

Students will be able to:

1. distinguish between hardware and software to understand the working of computers.
2. produce word documents with relevant images and objects to present meaningful information.
3. gather relevant information from the Internet and store useful weblinks for easy access later.
4. practice appropriate data backup and malware prevention strategies for data security.
5. create animations, stories, and games using a block programming tool to enhance creativity and develop coding skills.

STRAND A – Technology Operation

1. COMPUTER HARDWARE & SOFTWARE

A computer is made up of hardware and software to function. It is important for students to know that with either one of them, a computer is useless. Therefore, students have to know the differences between hardware and software and be able to identify common hardware and software that they use in the school for learning.

Under this topic, students will list some of the common software such as MS Office, MS Paint, Windows Media Player, and some mobile applications that they use on daily basis. They will also be informed about companies who develop the software and hardware and why. This will ignite curiosity within the students to explore the skills and processes of becoming software developers and encourage them to take coding lessons more seriously.

COMPETENCY 1: Students will be able to distinguish between hardware and software to understand the working of computers.

Topics	Key Stage Standard	Objectives	Time
Computer Hardware and Software <ul style="list-style-type: none">• Definition of hardware and software• Difference between hardware and software• Examples of hardware and software	A2.1 Explain the working of a computer	5-A2.1.1 Differentiate between hardware and software.	80 mins (2 periods)

Learning experiences:

- Create a PowerPoint presentation showing examples of hardware and software to explain that a computer requires both hardware and software to function.
- Display real objects of computer hardware and examples of common software for students to observe and make distinctions.
- Explain hardware and software, and ask students to make a list of the software and hardware they have used before.
- Provide examples of hardware and software used by people working in different fields. For example, web designers use designing software that requires better processors and graphics. Filmmakers use video editing software and cameras.
- Divide students into groups and let them browse the Internet to make a presentation on computer hardware and software.

- Create video lessons on computer hardware and software, and share them on the class online platform.
- Share weblinks having videos, pictures or animations on computer hardware and software through the class online platform and ask students to list the differences between computer hardware and software.
- Arrange a video conferencing lesson on computer hardware and software through Zoom or Google Meet, and ask students to take notes.

Assessment:

- Provide worksheets for students to list the difference between computer hardware and software.
- Observe and maintain a record of students' participation in pairs or groups when discussing computer hardware and software.
- Ask students to make group presentations on computer hardware and software, and use rubrics to evaluate their work.
- Conduct simple class tests having different types of questions (MCQ, fill in the blanks, matching, etc.) on computer hardware and software.
- Ask students to list examples of hardware and software they use or find at home.
- Share questions on computer hardware and software through the class online platform for students to complete and submit.
- Conduct online quizzes on computer hardware and software for all the students to complete within a given time frame.

Questions:

1. Distinguish between hardware and software with examples of each.
2. List some of the common hardware and software that students frequently use at school or at home.
3. What are some of the differences between paid and free software?
4. List your favourite software and explain why you like it.
5. How are software and hardware connected?

Resources:

1. **Computer Hardware and Software:** The weblinks contain videos and information on computer hardware and software.
 - https://www.youtube.com/watch?v=zlT-Lg_QFTA
 - https://www.youtube.com/watch?v=dCX_NWui0bs
 - <https://www.geeksforgeeks.org/difference-between-hardware-and-software/>
 - https://www.it.iitb.ac.in/~vijaya/ssrvn/dokuwiki/media/cm7_11_19spt.pdf
 - <https://www.youtube.com/watch?v=mR0jt2ByM08>

- <https://slideplayer.com/slide/10431181/>
2. **Class V Literacy with ICT Textbook:** Teachers may refer chapter one of the textbook on computer hardware and software.
- <https://rec.gov.bt/textbooks-and-manuals/#683-902-wpfd-ict-1586092614>

2. IMAGES IN WORD

Working on a Word document will be a common task for students as they progress through different classes. They will have to produce reports and documents in MS Word as a part of projects and assignments. Therefore, having good knowledge and skill in Word is important from an early stage.

Under this topic, students will learn to add images in the Word document to add value to their documents or reports. They will also learn to crop, resize, align and add effects to images to make them attractive and relevant. Teachers will have to give projects where students come up with reports or write-ups that require images from the Internet or the ones they took personally. Students will also add relevant objects that are available in Word to enrich the document.

COMPETENCY 2: Students will be able to produce word documents with relevant images and objects to present meaningful information.

Topics	Key Stage Standard	Objectives	Time
Images in MS Word <ul style="list-style-type: none"> • Adding images and objects in word document • Formatting images and objects in word document <ul style="list-style-type: none"> ◦ Edit, crop, picture effects and styles. 	A2.2 Create a formatted document using a word processor.	5-A2.2.1 Add images and objects to enhance a word processing document.	400 mins (10 periods)

Learning experiences:

- Demonstrate how to add relevant images, shapes and SmartArt using the Insert tab in a Word document and ask students to follow the steps.
- Use a projector to demonstrate how to format pictures in Word by changing styles, colour, size, and layout. Then, allow students to practice picture formatting in Word.

- Show a video to students on inserting images and objects to enhance a word document. Then ask students to add images or objects to their document by following the video.
- Make students write an essay or story as a part of their English lesson in Word and then tell them to add appropriate pictures or shapes to enhance the essay or story.
- Allow students to design a poster in Word document on topics such as planting trees to save the environment, working hard to achieve dreams, and waste management. Guide them to add relevant images and shapes to the poster.
- Create videos or PowerPoint presentations on adding images and objects in Word documents and share them on the class online platform.
- Provide relevant online resources such as video tutorials on adding images and objects on the class online platform for students to refer to and create a Word document.
- Conduct a video conference to demonstrate how to enhance a Word document by adding images and objects.

Assessment:

- Observe and maintain a record of how students are participating and performing when they are adding images and objects in Word.
- Assign group projects to create a report of a science experiment or field trip in Word and evaluate their work based on a rubric that has items on adding images and objects.
- Give short questions for students to write about the benefits of images and objects in Word documents.
- Assign a task on adding images and objects in Word through the class online platform and ask them to submit for evaluation.
- Share a Word document having text, images, shapes, and SmartArt that are not properly formatted and arranged. Ask students to apply appropriate formatting and rearrange the objects to give the desired message.
- Share a worksheet for students to write the correct steps of adding images and objects in Word, and submit it through the class online platform.

Questions:

1. How does inserting images and objects in MS Word add to the overall look of the document?
2. When do you add an image or object to a document?
3. What are some of the word processing programs besides MS Word that you have used to wish to explore?
4. What types of documents have you created so far using MS Word? Where do you think MS Word documents will be used by you in the future.

Resources:

1. **Adding Images in Word:** The weblinks show how to insert and crop an image in the Word document.
 - <https://www.youtube.com/watch?v=v1CT86pCtik>
 - <https://edu.gcfglobal.org/en/word2010/formatting-pictures/1/>
 - <https://pdf.wondershare.com/word/edit-a-picture-in-word.html>
 - <https://www.howtogeek.com/school/microsoft-word-document-formatting-essentials/lesson4/>
 - <https://www.youtube.com/watch?v=GEXIHfM8MMA>
2. **Class VI Literacy with ICT Textbook:** Teachers may refer chapter two of the textbook on inserting pictures in Word.
 - <https://rec.gov.bt/textbooks-and-manuals/#683-909-wpfd-ict-1586092802>

STRAND B – Communication and Collaboration

3. INTERNET SEARCH

An Internet search is an entry into a search engine such as Google to search for information and resources. Searching the Internet has become so common and regular in the digital era that more than 5 billion searches were handled by Google per day.

With the Internet becoming an indispensable tool for education, communication, collaboration, business, and many others, it is important that our students benefit from using the Internet. Under this topic, students will learn about the search engine and how using the keywords help to gather relevant information faster. They will also learn to create a bookmark in the browsers like Google Chrome and check their Internet records through history. Further, students will share their bookmarks with peers which will help to add them to the list of their bookmarks.

COMPETENCY 3: Students will be able to gather relevant information from the Internet and store useful weblinks for easy access later.

Topics	Key Stage Standard	Objectives	Time
Internet Search <ul style="list-style-type: none">• Definition of Uniform Resource Locator• Features of the browser<ul style="list-style-type: none">◦ address bar, history• Creating bookmarks	B2.1 Manage relevant links using browser	5-B2.1.1 Store relevant links using a browser. 5-B2.1.2 Use search engines to look for	160 mins (4 periods)

<ul style="list-style-type: none"> • Definition and examples of search engines • Search information using different search engines 		relevant information.	
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Learning experiences:

- Demonstrate and explain the web browser’s features such as address bar, bookmarks and history one by one and then allow students to practice these features.
- Provide students with a list of weblinks on finding the area and perimeter of 2D shapes. Then ask them to go through the links and bookmark the links for future reference.
- Demonstrate the process of searching for information on a topic such as “The Solar System” using different search engines. Then, make students observe the difference and similarities produced by each search result.
- Create a PowerPoint presentation on different search engines and make students search for information using various search engines.
- Show and explain the history feature of a web browser and make students check the list of websites they have visited in the last week.
- Create a PowerPoint presentation on web browsers and search engines, and share it on the class online platform. Ask students to explore the Internet and share a link on concepts related to English.
- Provide online resources such as videos, pictures and documents on search engines and web browsers on the class online platform for students to refer to and practice online search.
- Conduct a video conferencing lesson on how to use different search engines to look for relevant information and save the web address for future reference.

Assessment:

- Observe and maintain a record of how students are using search engines to look for information they need for an assignment.
- Ask students to maintain a bookmark of useful websites and check the bookmark list after a month.
- Provide a set of questions on search engines and web browsers for students to answer and submit after a certain duration.
- Arrange an online test using Google Forms on search engine and web browser.
- Ask students to maintain a bookmark of useful websites and share it in the class online platform for assessment.
- Give a simple project work on Science topics where students have to search and use information from the Internet.

- Develop an online test using Google Forms on a web browser and search engine for students to participate and submit within a given time frame.

Questions:

1. Mention some of the search engines that you use to look for information.
2. How do you store the weblinks or online materials for future reference?
3. What are the benefits of using the bookmarks in a browser?
4. How many bookmarks have you maintained in your browser? What type of resources have you listed in your bookmark?

Resources:

1. **Search Engines:** The weblinks contain resources on search engines and strategies to search for information from the Internet.
 - <https://www.youtube.com/watch?v=7RlB1CJovTs>
 - <https://www.youtube.com/watch?v=53rwA2d8fyw>
 - <https://www.youtube.com/watch?v=0eKVizvYSUQ>
 - <https://turbofuture.com/internet/What-is-a-Search-Engine-Definition-and-Examples>
2. **Web Browser:** The weblinks provide information on web browsers and their features.
 - <https://byjus.com/govt-exams/web-browser/>
 - <https://www.computerhope.com/jargon/b/browser.htm>
3. **Bookmarks:** The weblinks provide information on creating bookmarks/favourites in the browser.
 - <https://www.computerhope.com/issues/ch000858.htm>
 - <https://www.youtube.com/watch?v=UhZKffAcGAA>
 - <https://edu.gcfglobal.org/en/chrome/bookmarking-in-chrome/1/>

STRAND C – Safety and Ethics

4. COMPUTER MALWARE

Computer malware is any program or file that are harmful to computer, networks and servers. There are many types of computer malware such as computer viruses, worms, trojan horses, spyware and ransomware. If a computer suddenly slows down, crashes, or repeatedly shows error messages, there are high chances that it has been infected by malware.

Under this topic, students will learn about computer malware and get informed about the sign of a malware-infected computer. They will also learn about data protection to avoid the risk of losing personal data and files when computers get attacked by malware. Learning about malware

and its types and impact on computer users will inform students about the risk of computer malware, and they will learn to adopt measures to protect their computers and data.

COMPETENCY 4: Students will be able to practice appropriate data backup and malware prevention strategies for data security.

Topics	Key Stage Standard	Objectives	Time
Malicious Software <ul style="list-style-type: none"> Definition of malware Different types of malware <ul style="list-style-type: none"> Virus, worms, trojan horse, ransomware Signs of malware-infected system <ul style="list-style-type: none"> slow computer blue screen of death lack of storage space Pop-ups, websites, toolbars, and other unwanted programs Ways to prevent malware Definition, advantages and best practices of data backup 	C2.2 Follow measures to protect personal data.	5-C2.2.1 Adopt measures to prevent malware infection. 5-C2.2.2. Back up personal data in different locations to secure data.	160 mins (4 periods)

Learning experiences:

- Prepare a PowerPoint presentation to explain types of malware such as viruses, trojan horses and worms, and ask students to take notes.
- Show videos on examples of malware-infected systems and ask students to share if they have come across any virus infected system or device in the past.
- List the signs of malware-infected systems and allow students to search for more information on each sign using the Internet.
- Discuss in groups different ways to prevent computers from malware infection and ask each group to present one measure to the class.
- Display some examples of external storage devices such as pen drives, hard disks, and DVDs for students to discuss in groups and list their benefits.
- Demonstrate how to backup data in Google Drive or a thumb drive, and discuss the benefits of doing this regularly.
- Narrate a story of someone who lost important documents to virus infection or physical damage to a computer, and start a class discussion on the importance of data backup.
- Create a PowerPoint presentation on types of malware and share it on the class online platform. Ask students to take notes on different computer malware.

- Provide links to online resources on strategies to prevent computers from virus infection on the class online platform for students to refer to and list the negative impact of computer viruses.
- Create a short video on data backup and ask students to find out how their parents' backup important data.
- Conduct video conferencing with students to share on computer malware infections and the importance of storing personal data on different devices.

Assessment:

- Pick students randomly and ask them to list different types of computer malware.
- Ask students in groups to explore the Internet and make a presentation on ways to prevent computer viruses and backup personal data.
- Observe and maintain a record of students when they are backing up personal data on different devices.
- Conduct a class test using different sets of questions on computer malware and data backup.
- Give a project work to create a poster on ways to prevent computer viruses and data backup.
- Share a worksheet on computer malware and data backup for students to complete at home and submit on the class online platform.
- Ask students to find out how their parents, siblings and neighbours are taking care of their computer devices and personal data.
- Conduct an online quiz on types of computer malware and different ways to backup personal data.
- Share a Google Docs with students and ask them to write a short essay on the importance of preventing malware infection and regular data backup in the digital world.

Questions:

1. Mention some of the measures to protect personal information and data.
2. What are common malware that you or your friends have encountered while using the computer or mobile devices.
3. When do you usually back up your data?
4. How do you relate the importance of data protection and backup in a real-life situation?
5. What are some of the signs of a malware-infected computer and mobile device?
6. If your computer is infected with malware, what would you do to fix it?

Resources:

1. **Computer Malware:** The weblinks provide information on computer malware and ways to prevent them in order to save personal computers and data.
 - <https://www.safesearchkids.com/a-guide-to-removing-malware-from-your-childs-computer/#.YCIJhugzblU>
 - <https://www.bbc.co.uk/bitesize/topics/zd92fg8/articles/zcmbgk7>
 - <https://www.csoonline.com/article/3295877/what-is-malware-viruses-worms-trojans-and-beyond.html>
 - <https://www.cisco.com/c/en/us/products/security/advanced-malware-protection/what-is-malware.html>
 - <https://www.educba.com/types-of-malware/>
 - https://www.youtube.com/watch?v=AfZxUK9U3hE&ab_channel=Proofpoint
2. **Data Backup:** The weblinks provide information on the importance of data backup and some measures to backup data.
 - <https://www.welivesecurity.com/2015/03/31/6-ways-to-back-up-your-data/>
 - <https://cloudian.com/guides/data-backup/data-backup-in-depth/>
 - <https://kids.kiddle.co/Backup>
 - <https://www.conncoll.edu/information-services/technology-services/data-backups-for-students---getting-started/>
3. **Class VII & VIII Literacy with ICT Textbook:** Teachers may refer to chapter four of the class VIII textbook on malware and chapter eight of the class VII textbook on data backup.
 - <https://rec.gov.bt/textbooks-and-manuals/#683-918-wpfd-ict-1586092977>
 - <https://rec.gov.bt/textbooks-and-manuals/#683-926-wpfd-ict-1586093142>

STRAND D – Coding

5. ANIMATION IN SCRATCH

Scratch is block-based programming designed for kids to allow them to create interactive stories, games and animations. Scratch helps students to think creatively, reason systematically, and work collaboratively. Scratch was created by the Lifelong Kindergarten group at MIT Media Lab and is available for free.

Under this topic, students will build on Scratch knowledge and skills they have learned in previous classes. They will use blocks related to pen, motion, variables, operators and functions to create animations, games and stories that are in the Bhutanese context. Teachers will also use interdisciplinary approaches to integrate concepts from other disciplines into the Scratch project. Such approaches will help students make meaning and relate their learning to a new context.

COMPETENCY 5: Students will be able to create animations, stories, and games using a block programming tool to enhance creativity and develop coding skills.

Topics	Key Stage Standard	Objectives	Time
Interactive Projects in Scratch <ul style="list-style-type: none"> Looks block <ul style="list-style-type: none"> change color effect, set color effect, show, hide, change size Control block <ul style="list-style-type: none"> create clone, delete clone, when I start as clone, stop all Pen block <ul style="list-style-type: none"> erase all, pen down, pen up, set and change pen colour, set and change pen size, stamp Motion block Event block (broadcast, when I receive) Sensing block (ask, if touching) Text to Speech block Variables (make variable, set variable, change variable) My Blocks, Operators block 	D2.1 Create an animation using block programming D2.2 Develop an advanced interactive project using block programming	5-D2.1.1 Add special effects to the character. 5-D2.1.2 Change coordinates of characters to draw interactively. 5-D2.2.1 Make characters communicate with each other. 5-D2.2.2 Create a custom block to perform a task.	1600 mins (40 periods)

Learning experiences:

- Make students create a simple animation in Scratch by adding special effects, music and customized elements to characters. Ask them to create an algorithm for the animation to highlight the importance of the coding process to develop computational thinking.
- Demonstrate the use of Pen block to draw different shapes, patterns and art in Scratch. Then, let students follow the steps to draw their own art and add colour effects to it.
- Provide grid paper with x and y coordinates for students to plot an object such as a house, chorten, and car. Then ask students to transfer the drawing of the same object in Scratch using Pen blocks.
- Demonstrate how to create an English story in Scratch using relevant characters, backdrops and animations. In the process of demonstration, explain the importance of coding concepts such as parallelism and events. Then assign a project work for students to come up with their stories in Scratch.
- Make a PowerPoint presentation to demonstrate and explain condition and loop concepts in Scratch. Then, form groups and ask them to use these concepts to create an animation on the theme.

- Demonstrate how to use custom blocks in Scratch and ask students to come up with an interactive Scratch project that has custom blocks. Guide students to reuse and remix codes they have used earlier for the project.
- Assign a major Scratch project which requires students to explore information and ideas from the Internet. Ask them to create an algorithm for the project and submit the completed work at the end of the year.
- Create video tutorials on drawing shapes and patterns using Pen blocks in Scratch and share them on the class online platform for students to refer to and create art.
- Provide students with online resources on how to create music, stories, games and animation in Scratch through the class online platform, and ask them to create a story, music or game project.
- Assign a task on the class online platform where students have to listen to a story from their parents and then create the story in Scratch. Guide students to design an algorithm and use relevant backdrops, sprites and animations to make the story interesting and engaging.
- Conduct a video conference to demonstrate how to create stories, games and animations in Scratch. As a follow-up to the lesson, assign a task to create a game in Scratch.

Assessment:

- Assign project works to create interactive stories or games in Scratch and assess them based on the rubrics.
- Observe and keep a record of students' participation in class or group works during Scratch lessons.
- Assign groups to create and present a Scratch project. Give grades and feedback.
- Conduct practical tests on Scratch contents in the class.
- Create and conduct quizzes in the classroom on Scratch using online assessment tools such as Google Forms, Kahoot and Triventy.
- Maintain records of Scratch projects such as arts, stories and animations submitted by students through the online class platform.
- Create questions on Scratch using online assessment tools such as Google Forms and Kahoot and share them on the class online platform.

Questions:

1. What are some of the lessons and challenges you derived from creating animations in Scratch?
2. How did events and sensing blocks help you to come up with interactive Scratch projects.
3. How do you relate a *Custom* block to a real-life situation? Cite an example to explain custom blocks.

4. What code or blocks did you use to make the sprites communicate with each other? How does this help to make your project interactive and interesting?
5. Using the various coding blocks in Scratch that you have learned so far, what kind of project would you like to create in Scratch? Would you prefer to do it individually or in groups? Why?
6. Explore some of the online Scratch projects from the Scratch website and try to remix the projects.

Resources:

1. **Scratch:** The weblinks contain sample lessons and tutorials to create interactive projects in Scratch.
 - <https://scratch.mit.edu/>
 - <http://scratch.redware.com/lessonplan>
 - [Scratch Wiki:Table of Contents/Blocks - Scratch Wiki \(scratch-wiki.info\)](http://scratch-wiki.info/)
 - <https://africacodeweek.org/images/uploads/assets/EN-Scratch-3-Course-Notes.pdf>
2. **Variables:** The weblinks provide information on variables in Scratch.
 - <https://youtu.be/aMYdxqsQNBA>
 - https://en.scratch-wiki.info/wiki/Variables_Tutorial
3. **Function and Event:** The weblinks provide information on creating functions and events in Scratch.
 - <https://youtu.be/snk8aMIz-Z8>
 - https://en.scratch-wiki.info/wiki/My_Blocks
 - https://www.youtube.com/watch?v=_4pCzOTE8PY

Class Six

Students will be able to:

1. produce a formatted document with tables to submit a report of their project work.
2. create a theme-based digital poster using an image editing tool to communicate messages effectively.
3. communicate with colleagues and teachers through emails for collaboration, reporting and exchanging information.
4. participate in online block coding communities to exchange ideas and enhance coding skills.
5. exhibit good practices of evaluating online resources to avoid false information and irrelevant materials.
6. create animations, stories, and games using a block programming tool to enhance creativity and develop coding skills.

STRAND A – Technology Operation

1. TABLE AND PAGE FORMATTING

Tables are often used in Word documents to organise and present information. Tables are made up of rows and columns, and this helps to arrange information properly. Formatting tables in Word documents is an important beginner's skill that requires users to align table height and width, add colours, merge and split cells, and others.

Under this topic, students will learn to add tables in Word documents to present their information in an organised manner. They will use tables in the simple reports or tasks assigned to them. Besides table formatting, students will also learn to format the page of a Word document. They will add header and footer, set margins and change orientations.

COMPETENCY 1: Students will be able to produce a formatted document with tables to submit reports of their project works.

Topics	Key Stage Standard	Objectives	Time
Page and Table Formatting <ul style="list-style-type: none">• Adding a table• Table formatting<ul style="list-style-type: none">◦ Adding, deleting rows or columns◦ text alignment, wrapping◦ row height and width◦ cell and table border, design• Page formatting<ul style="list-style-type: none">◦ setting header and footer◦ setting page margins◦ page size, numbers, orientation	A2.2 Create a formatted document using a word processor.	6-A2.2.1 Apply page and table formatting to enhance a word processing document.	160 mins (4 periods)

Learning experiences:

- Demonstrate how to add tables and apply table formatting in a Word document. Then ask students to create a simple table such as their class timetable for the week.
- Provide a Word document having table, text, images and shapes for students to apply appropriate page layout and formatting to improve the design of the document.
- Create a PowerPoint presentation to show examples of good and bad page layouts and designs in Word documents. Then ask students to identify and list the elements of good layout and design in a document.
- Assign project works to write reports or essays on topics they learned in English, Science or Social Studies. Guide students to insert relevant tables and apply page formatting.

- Share a video tutorial to students on how to add tables in Word documents and then ask them to create a table containing their to-do list for the year.
- Make students browse the Internet for information on formatting Word documents and ask them to demonstrate it to the class.
- Create and share a video lesson on table and page formatting in Word and share it on the class online platform.
- Share relevant online resources on table and page formatting in Word and ask students to create a document having the list of kitchen items to cook a dish.
- Conduct a video conference to demonstrate table and page formatting using tools such as Zoom or Google Meet. Then ask students to create a one-page document showing their study timetable at home.

Assessment:

- Ask students to demonstrate the steps to add tables and apply page formatting in Word and maintain a record of their performance.
- Assign project works in Word documents to create content related to other subjects and evaluate them based on a rubric.
- Maintain a record of documents created by each student using Word and save it in a folder for evaluation.
- Assign a task on adding tables and applying page formatting in Word and ask them to submit the work through the class online platform.
- Make students create tables and apply page formatting in Google Docs. Ask them to share the online file for evaluation.

Questions:

1. How did you add tables in a word document?
2. What are the benefits of using header and footer in a document?
3. What are some of the key elements of page formatting?
4. When do you use the portrait and landscape page orientation? How do you relate the page orientation to a real-life situation?

Resources:

1. **Formatting Table in Word:** The weblinks provide information on adding and formatting tables in Word.
 - <https://www.montclair.edu/media/montclair.edu/oit/documentation/office2016/Word-2016,-Creating-a-Table.pdf>
 - <https://www.universalclass.com/articles/computers/office-365/using-tables-in-word-2016.htm>
 - <https://www.youtube.com/watch?v=3v3J1bBK8c>
 - <https://www.youtube.com/watch?v=F-TiTbKDr5s>

- <https://www.youtube.com/watch?v=ZfkTx8RjuRE>
 - <https://www.youtube.com/watch?v=2y-HY10SBPQ>
2. **Page Formatting in Word:** The weblinks provide information on page formatting in Word.
- <https://edu.gcglobal.org/en/word2013/page-layout/1/>
 - <https://www.universalclass.com/articles/computers/office-365/page-formatting-in-word-2016.htm>
3. **Class VI Literacy with ICT Textbook:** Teachers may refer to chapter two of Class VI textbook on table formatting in Word.
- <https://rec.gov.bt/textbooks-and-manuals/#683-909-wpfd-ict-1586092802>

2. IMAGE EDITING

Image editing refers to modifying photographic images using different techniques and tools. All images captured by scanners, smartphones or digital cameras may not be good for purposes related to students' learning and therefore will require modification. Image editing will help to create the best possible look for the images and will improve overall image quality.

Under this topic, students will learn to use an image editing software - Paint.NET which is a free tool to modify and improve images. They will learn to combine more than one image and enhance colours and contrast using Paint.NET. Students may also use mobile Apps to take pictures and apply editing tools to enhance the images. As a part of projects on image editing, students will create posters and greeting cards individually or in groups.

COMPETENCY 2: Students will be able to create a theme-based digital poster using an image editing tool to communicate messages effectively.

Topics	Key Stage Standard	Objectives	Time
Image Editing in Paint.NET <ul style="list-style-type: none"> • Definition of multimedia • Types of multimedia <ul style="list-style-type: none"> ◦ Text, graphics, audio, video, etc. • Taking pictures and transferring into computer • Paint.NET window <ul style="list-style-type: none"> ◦ features, advanced tools ◦ applying adjustments and effects • Project on image editing 	A2.3 Enhance image using an image editing software.	6-A2.3.1 Edit pictures using image editing tools.	400 mins (10 periods)

Learning experiences:

- Create a PowerPoint presentation on types of multimedia and how image editing is a useful tool to create digital posters. Then ask students to share their opinions on digital posters.
- Introduce the Paint.NET program to edit images through resizing, removing backgrounds, adding colour effects, etc., and then allow students to practice the tool on their own.
- Display a digital poster created in Paint.NET and allow students to create it using the same tool.
- Form groups and assign different tasks on image editing. Guide the groups to create a digital poster on a relevant theme such as “Save the environment”, “Fight Mobile Addiction”, and “Health is Wealth”.
- Demonstrate how to take pictures using mobiles phones or digital cameras and show students how to transfer those pictures into the computer for editing.
- Provide relevant online resources on multimedia and image editing through the class online platform, and ask students to take notes.
- Create a video tutorial on how to use Paint.NET to perform basic image editing and share it on the class online platform.
- Conduct a video conference to demonstrate how to apply basic image editing in Paint.NET. Then assign a task on image editing to students.

Assessment:

- Set questions to conduct a test on the types of multimedia and image editing techniques.
- Assign a project work to create a digital poster on a relevant theme using Paint.NET and evaluate the work based on a rubric.
- Make students explore the Internet to list the elements of a good digital poster and ask them to prepare a presentation to the class for evaluation.
- Observe and maintain a record of students participating in the class during the lessons or group activities on image editing.
- Assign a task on creating a digital poster using Paint.NET or drawing apps on the relevant theme and ask them to submit the work on the class online platform.
- Share a list of digital posters through the class online platform and ask students to evaluate and choose one poster they liked based on the design, colour, creativity and theme.
- Ask students to submit a picture they have taken at home with some applied effects and text to convey a message.

Questions:

1. What are some of the benefits of having image editing skills?
2. What aspect of the Paint.NET did you like the most? Why?
3. To design a poster, what are some of the key elements of a good poster?
4. Pick a good poster that you have seen in and around your school or community and try to create a similar poster.
5. What other image editing tools do you use to manipulate or modify pictures? Why?

Resources:

1. **Introduction to Multimedia:** The weblinks explain multimedia and its types.
 - https://www.tutorialspoint.com/multimedia/multimedia_introduction.htm
 - <https://www.ftms.edu.my/images/Document/MMGD0101%20-%20Introduction%20to%20Multimedia/MMGD0101%20chapter%201.pdf>
2. **Paint.NET:** The weblinks provide links to download Paint.NET and tutorials on image editing using the tool.
 - https://download.cnet.com/Paint-NET/3000-2192_4-10338146.html
 - <https://www.getpaint.net/doc/latest/index.html>
 - https://www.youtube.com/watch?v=fsL935G0VMM&ab_channel=justintheoreo
3. **Class VII Literacy with ICT Textbook:** Teachers may refer to chapter six of Class VII textbook on multimedia and image editing using Paint.NET.
 - <https://rec.gov.bt/textbooks-and-manuals/#683-918-wpfd-ict-1586092977>

STRAND B – Communication and Collaboration

3. EMAILS

The exchange of messages instantly across the world has become possible because of emails. Email is a method of sending messages from one computer to another through the Internet. Email is the electronic equivalent of a letter, but with the advantages of speed, flexibility and storage.

Under this topic, students will be able to create individual email accounts and exchange emails with others by applying different email features such as signatures and attachments. With the support from language teachers, students will send emails in both Dzongkha and English following the correct language and grammar. They will be informed about email etiquette and exchange email with friends and teachers within and outside of their school to share information and build networks.

COMPETENCY 3: Students will be able to communicate with colleagues and teachers through emails for collaboration, reporting and exchanging information.

Topics	Key Stage Standard	Objectives	Time
Email <ul style="list-style-type: none"> Definition of e-mail <ul style="list-style-type: none"> advantages of email different email service providers Creating and managing email <ul style="list-style-type: none"> creating email account compose, send, forward, reply, subject, cc, signature Email attachment, etiquettes Project - email attachment. 	B2.2 Use email to communicate and collaborate C2.4 Follow email etiquettes for effective communication	6-B2.2.1 Use email to communicate with others 6-C2.4.1 Follow etiquettes in email communication.	160 mins (4 periods)

Learning experiences:

- Create a PowerPoint presentation on email, features of email, benefits of email and etiquettes to follow in email communication. Then ask students to check the email features in their email accounts.
- Demonstrate to students how to send an email to the class teacher or the principal requesting a day's leave. Show them the time taken for the email to reach the other person and reply to the mail.
- Make students explore the Internet on how to create email accounts and good practices to follow in email communication. Then, ask them to create an account.
- Collaborate with English teachers to teach students how to write an email message and send it to relevant people such as friends, family, and education officials on subjects related to their education and learning in school.
- Provide an opportunity for students to exchange emails having attachments among themselves. Guide them to share useful learning materials and respond appropriately.
- Share relevant online resources on how to create and use email for communication on the class online platform. Then, ask students to send an email to their teacher.
- Create video tutorials on the features of email such as compose, forward, reply, and attachment, and share them on the class online platform. Guide students to send an email attachment to their friends.
- Conduct a video conference to teach students the etiquette of email and how to send emails to communicate in a digital world. Then, ask students to share their experiences.

Assessment:

- Ask students to send you an email with an attachment on a topic. Evaluate their email based on subject, content, attachment and signature.
- Ask students to create a poster on email etiquettes and make them present to the class for feedback and evaluation.
- Assign a project for students to send emails to their friends and families within two weeks. Once the duration is over, check their account for the number and content of emails they have exchanged with others.
- Ask students to create a poster on do's and don'ts of email etiquette for evaluation.
- Assign students to send an email to their English teacher on how they have spent their weekend at home. Remind them to attach relevant pictures.
- Conduct online tests using Google Forms on email etiquettes and benefits of email.

Questions:

1. What is an email and how do you use it?
2. What are some of the benefits of email?
3. How do you send materials and online resources through email?
4. Send an email to your teacher asking for additional resources or support to complete the task assigned by the teacher. Mention clearly what you need and how you want to use the resource to improve your learning.
5. In discussion with your teacher, look for an opportunity to correspond with an educator or civil servant through email to gather more information. The information can be related to career opportunities or common issues in your school that you intend to solve.

Resources:

1. **Email:** The weblinks provide information on email service providers and how to manage an email account.
 - <https://edu.gcfglobal.org/en/email101/common-email-features/1/>
 - https://www.poplarbluff.org/classes/eml_pkt.pdf
 - <https://www.youtube.com/watch?v=2eH0JbEE-6k>
 - <https://www.computerhope.com/jargon/e/email.htm>
2. **Email Etiquettes:** The weblink contains some tips on email etiquettes while sending an email.
 - <https://www.slideshare.net/celiatarnowski/email-etiquette-presentation-13670059>
 - <https://www.youtube.com/watch?v=hgMvrcgYeGY>
 - <https://www.youtube.com/watch?v=2iPNbawM3SU>
 - <https://www.europarc.org/communication-skills/pdf/Email%20etiquette.pdf>

3. **Class VI & VII Literacy with ICT Textbook:** Teachers may refer chapter four of the class VI textbook on email and chapter four of class VII textbook on creating email accounts.
 - <https://rec.gov.bt/textbooks-and-manuals/#683-909-wpfd-ict-1586092802>
 - <https://rec.gov.bt/textbooks-and-manuals/#683-918-wpfd-ict-1586092977>

4. ONLINE SCRATCH COMMUNITY

The online Scratch community was launched in 2007 to enable children, primarily between the ages of 8 and 16, to share interactive games, stories, and animations created with the Scratch programming environment. It provides children from across the world to share their projects and seek feedback or modifications.

Under this topic, students will create an online account in Scratch and begin to create Scratch projects. They will also remix and modify others' projects and provide feedback. Using the online Scratch platform will inform students about the global Scratch community and how the platform is helping children to learn coding concepts through fun and engaging animations, stories, and games.

COMPETENCY 4: Students will be able to participate in online block coding communities to exchange ideas and enhance coding skills.

Topics	Key Stage Standard	Objectives	Time
Scratch Online Community <ul style="list-style-type: none"> • Definition of online community • Creating an account for Scratch community • Uploading personal projects • Participate in online discussion <ul style="list-style-type: none"> • comments, questions, suggestions, seek advice 	B2.3 Participate in an online block coding community.	6-B2.3.1 Share personal projects in online block coding communities.	80 mins (2 periods)

Learning experiences:

- Demonstrate and explain the online Scratch community. The link to online Scratch is given in the resource below.
- Take through the steps to create an online Scratch account and guide students to create individual accounts. Tell them to remember their username and password.
- Show projects and studios shared by others on the Scratch website and make students explore and remix some of them. Then, ask students to share their observations on the online Scratch community with the class.

- Instruct students to upload or create animations on the online Scratch platform. Ask them to share their projects and give comments on others projects on the platform.
- Share videos on how to create an online Scratch account and participate in the Scratch community through the class online platform. Then, instruct students to join the Scratch community.
- Share relevant online resources on the Scratch community through the class online platform and instruct students to create animations and games.

Assessment:

- Maintain a record of projects created by students on the online Scratch website.
- Check the comments and suggestions made by students on the online Scratch projects.
- Create and share a Scratch project on the online Scratch website and ask students to remix the project. Evaluate their remixed work based on a rubric.
- Maintain a record of online Scratch projects created by students at home.
- Ask students to use Google Docs or Word to write about what they have learned from the online Scratch community, and by creating and sharing projects with others. Make them reflect and list new skills they have learned.

Questions:

1. What is the main purpose of the online Scratch community?
2. How do you participate in the online Scratch community?
3. How many projects have you created or modified in the online Scratch community?

Resources:

1. **Online Scratch Community:** The weblinks provide information on how to join the online Scratch community, create projects and share them with others.
 - <https://scratch.mit.edu/join>
 - https://scratch.mit.edu/community_guidelines
 - https://www.youtube.com/watch?v=Xg2vs0NJ6WI&ab_channel=FlourishField
 - <https://www.youtube.com/watch?v=se8di8cBj70>
 - https://www.youtube.com/watch?v=6EwcFTBdVQ4&ab_channel=AnindyaRoyTheTechmaster
 - <https://pdst.ie/sites/default/files/Scratch%20Participant%20Manual%202019.pdf>

STRAND C – Safety and Ethics

5. INFORMATION LITERACY

Information literacy refers to the ability to identify, find, evaluate and use information effectively. With access to the Internet, we have access to unlimited information. New information is shared every day on the Internet for various purposes and finding relevant information and using it effectively has become an important skill that every student must learn.

Under this topic, students will learn that not all information on the Internet is correct and they need certain skills such as evaluating and acknowledging sources of information to gather relevant information. Students will learn how to evaluate the quality, credibility, and validity of websites, and give proper credits while using the information from the website. Further, they will learn about fake news and how to identify fake from true news.

COMPETENCY 5: Students will be able to exhibit good practices of evaluating online resources to avoid false information and irrelevant materials.

Topics	Key Stage Standard	Objectives	Time
Information Literacy <ul style="list-style-type: none">Definition of information literacyEvaluation criteria for online information<ul style="list-style-type: none">author, date, accuracy, objectivity, fairnessIdentifying and tackling fake news	C2.3 Evaluate the credibility of information gathered from the Internet.	6-C2.3.1 Evaluate online information.	80 mins (2 periods)

Learning experiences:

- Prepare a PowerPoint presentation on information literacy and why information literacy skills are important in the digital world. Explain the elements of information literacy such as defining, finding, evaluating, organising and communicating. Ask students to take notes.
- Display examples of fake and real news on the screen and make students identify them based on the source, currency, relevancy and intention of such information.
- Present the criteria such as authority, accuracy, objectivity, currency and coverage to evaluate online information and ask students to evaluate an online news article or video based on these criteria.
- Allow students to browse the Internet to search for information on how to identify fake news and ways to prevent them. Ask students to make a presentation to the class.
- Create a video lesson on information literacy and evaluation criteria (author, date, accuracy, objectivity, fairness) for verifying online information and share it on the class online platform.

- Provide links to news articles from the Internet and ask students to evaluate the information based on the criteria. Ask them to share their thoughts on whether the information in the new articles is credible and reliable.

Assessment:

- Assign a project work in groups to create a poster on information literacy.
- Ask students to write an essay on why we should not trust every piece of information shared on the Internet. Evaluate their essays based on a rubric.
- Conduct a class test on information literacy, criteria to verify online information and fake news.
- Conduct an online quiz using Google Form to test how much students are informed about information literacy.
- Arrange an online discussion on fake news using the class online platform and maintain a record of each student's participation and understanding of fake news.

Questions:

1. What are some of the areas to consider when we evaluate online resources?
2. What is information literacy? How is it important to students?
3. How do you identify fake news from real news?
4. Mention some of the ways to inform your parents and friends on information literacy.

Resources:

1. **Information Literacy:** The weblinks provide information on information literacy and ways to verify and evaluate online information.
 - <https://www.youtube.com/watch?v=x1ggOZIw3mM>
 - <https://srpubliclibrary.org/kids/digital-resources/information-literacy-kids/>
 - [https://lib.nmu.edu/help/resource-guides/subject-guide/evaluating-internet-sources#:~:text=There%20are%20six%20\(6\)%20criteria,What%20about%20the%20news%3F](https://lib.nmu.edu/help/resource-guides/subject-guide/evaluating-internet-sources#:~:text=There%20are%20six%20(6)%20criteria,What%20about%20the%20news%3F) .
2. **Fake News:** The weblinks provide resources to identify fake news.
 - <https://library.pfeiffer.edu/Fake-News-Worksheet.pdf>
 - <https://www.mindtools.com/pages/article/fake-news.htm>
 - <https://blogs.ifla.org/lpa/files/2017/01/How-to-Spot-Fake-News.pdf>
 - https://www.youtube.com/watch?v=xf8mjbVRqao&ab_channel=JohnSpencer
 - <https://frankwbaker.com/mlc/fake-news-recommendations/?print=pdf>
 - <https://www.courts.ca.gov/documents/BTB24-PreCon2G-3.pdf>

STRAND D – Coding

6. INTERACTIVE PROJECTS IN SCRATCH

Scratch is a program to build computer games, animations and stories using a block-based language. It is designed to be fun and creative for children to build interactive projects and at the same time learn coding concepts. Scratch is free and available in multiple languages. When students learn to code in Scratch, they learn important strategies for solving problems, designing projects, and communicating ideas.

By this time, students would have a good understanding of creating basic animations and games in Scratch. At this level, students will use different blocks such as motion, looks, sound, events, control, sensing, variables and others to create a Scratch project. Students will incorporate all the elements of Scratch programming that they have learned so far to create projects such as arts, games, stories and animations that are relevant and meaningful. At the end of class six, students will be comfortable, confident and competent in Scratch coding to create block-based computer programs. Such experiences in Scratch coding at the primary level will provide a strong foundation for computational thinking skills and coding.

COMPETENCY 6: Students will be able to create animations, stories, and games using a block programming tool to enhance creativity and develop coding skills.

Topics	Key Stage Standard	Objectives	Time
Interactive Projects in Scratch <ul style="list-style-type: none">• Motion block (random, point towards)• Looks block (layers)• Sound block (change and set volume, stop all sounds)• Events block (when backdrop switches to)• Control block (wait until, repeat until, if-else)• Sensing block (distance to mouse pointer, color is touching)• Operators blocks<ul style="list-style-type: none">◦ arithmetic operator, comparison operator, logical operator, pick random, join, letter, length of, mod, round• Variable block (make a List)• My blocks, Pen block• Video Sensing block, Text to Speech• Major project in Scratch	D2.1 Create an animation using block programming. D2.2 Develop an advanced interactive project using block programming	6-D2.1.1 Animate characters and backgrounds for different roles in an animation. 6-D2.2.1 Add logical decisions to develop a game 6-D2.2.2 Use block programming to enhance an existing interactive project.	1520 mins (38 periods)

Learning experiences:

- Let students discuss in groups to create animations in Scratch that describe scientific phenomena, historical events, or concepts they have learned in other subjects. Guide them to use different blocks (control, event, pen, sensing, operators, variable, etc.) as per the need of the animation.
- Demonstrate a step by step process of creating an interactive game in Scratch. Use random features, sound settings, advanced control, variables, list, and sensing blocks in the game. Explain the element of games such as score, rules, player, obstacles, and time to make it engaging and interactive. Then, allow students to practice the steps demonstrated by the teacher on game development.
- Let students explore and identify a game shared on the online Scratch community and ask them to remix and recreate the game by adding conditions, operators, events, variables, lists and functions. Guide them to practice computational thinking and inform them that testing and debugging are a natural part of coding.
- Make students come up with independent Scratch projects (game, animation, story, music, art) on relevant themes. Instruct them to follow the project development process such as planning, researching, gathering and executing the project based on algorithms. Emphasis on good programming practices and explaining the concept of abstraction and modularity in the development of coding projects.
- Share videos and weblinks on creating interesting projects (games, animations, arts, stories, music) in Scratch and share them on the class online platform for students to come up with similar projects.
- Instruct students to create different projects on the online Scratch website and share them with others to improve and modify the projects. Tell them to make projects on themes related to contents or concepts they have learned in other subjects.
- Conduct video conferences to demonstrate a step by step process of developing a game in Scratch. Then, ask students to explore the Internet for game development ideas and create a similar game in Scratch.

Assessment:

- Create rubrics (number of projects, variety, creativity, originality, interactivity) to evaluate and record students' learning progress in Scratch block coding.
- Conduct practical tests to assess students' competency in Scratch coding.
- Use online assessment tools such as Google Forms, Kahoot, and Triventy to conduct quizzes on Scratch concepts and skills.
- Assign a final major project on Scratch for students to demonstrate all the skills and knowledge they have learned in Scratch coding. Give a certain duration to complete the projects and grade them by following a set of criteria.

- Organise coding competitions within the class or school so that students get motivated to learn to code.
- Maintain a record of online Scratch projects created by students at home.
- Conduct online tests or quizzes on Scratch coding using relevant online tools such as Google Forms, Google Docs, Kahoot, and others.
- Ask students to maintain a journal on coding in Scratch. Encourage them to write regularly on what and how they are progressing in Scratch coding and what they aspire to learn in future. The journal can be collected at the end of the term for evaluation.

Questions:

1. List the coding concepts that you have learned using the Scratch block coding.
2. How many animations or games have you developed in Scratch?
3. What are some of the challenges of using the Scratch and how do you intend to resolve them?
4. Do you prefer to create games or stories or animations in Scratch? Why?
5. Create a game, story, or animation based on a real-life situation or related to your school and community.
6. How did coding in Scratch help you to think more creatively and solve problems?

Resources:

1. **Scratch Projects:** The weblinks provide information on how to create projects in Scratch.
 - <https://junilearning.com/blog/coding-projects/how-to-make-a-scratch-game-step-by-step/>
 - <https://www.wikihow.com/Create-a-Racing-Game-in-Scratch>
 - <https://pinnguaq.com/learn/hungry-shark-scratch-game>
 - <https://myreadinglog.net/blog/platformer-game-on-scratch-tutorial/>
 - <https://resources.scratch.mit.edu/www/guides/en/StoryGuide.pdf>
 - <https://scratch.mit.edu/studios/3757922/>
 - <https://www.youtube.com/watch?v=wkbIZ9NgC3o>
2. **List Blocks:** The weblinks provide resources on how to use list blocks in Scratch.
 - <https://youtu.be/4HWpjKp6G-Y>
 - https://youtu.be/9_PlznVqkxs
 - <https://en.scratch-wiki.info/wiki/List>
3. **Colour and Video Sensing:** The weblinks contain video lessons on how to use colour and video sensing in Scratch.
 - <https://youtu.be/A5SVWU82M7I>
 - <https://youtu.be/H8p3q5PmXr4>
 - https://www.exploratorium.edu/sites/default/files/files/Video_Sensing.pdf

Annexure

Annexure 1: Class-wise period and time allocation

The period allocation for classes PP to XII ICT curriculum are as per the revised instructional time allocation notified by the Ministry of Education in March 2020.

Class	No. of Periods per Week (40 mins per period)	Total Period in Year (30 weeks)	Total Time (in mins)
PP	2	60	2400
I	2	60	2400
II	2	60	2400
III	2	60	2400
IV	2	60	2400
V	2	60	2400
VI	2	60	2400
VII	3	90	3600
VIII	3	90	3600
IX	3	90	3600
X	3	90	3600
XI	3	90	3600
XII	3	90	3600

Annexure 2: Key stage-wise assessment matrix

The table below provides an overview of assessment weighting for five key stages. Assessment at each key stage is broken down into four modes of assessment as specified in the ICT Curriculum Framework.

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) <i>(Formative assessment)</i>	Observation, Conversation	10	10	10	10	10
2	Participation and completion of homework. (face-to-face or online) <i>(Formative assessment)</i>	Observation, Conversation	10	10	10	10	10
3	Planning, research, documentation, creation and presentation of digital artefacts including coding projects. <i>(Formative assessment)</i>	Assessment of Digital Artefacts	80	60	50	40	30
4	Theory and/or Practical Test (unit, mid-term and annual exams) <i>(Summative assessment)</i>	Testing	0	20	30	40	50
Total			100	100	100	100	100

Annexure 3: Breakdown of assessment weightings in two terms

The table below provides the breakdown of weightings in four areas of ICT assessment for two terms. ICT teachers are required to keep a daily record of observations and conversations with learners during and after school, provide projects or tasks to create digital content, and conduct examinations at the end of each term.

Key Stage	TERM I				TERM II			
	Class Activity (observation & conversation)	Home Activity (observation & conversation)	Digital Artefacts (digital products)	Testing (examinations)	Class Activity (observation & conversation)	Home Activity (observation & conversation)	Digital Artefacts (digital products)	Testing (examinations)
I	CFA			-	CFA			-
II	5	5	20	10	5	5	40	10
III	5	5	20	10	5	5	30	20
IV	5	5	10	20	5	5	30	20
V	5	5	10	20	5	5	20	30

Annexure 4: Progress report format for key stage II

At the end of the year, students' record of formative and summative assessment in ICT will be reflected in the progress report given below. To complete the report, ICT teachers are required to maintain a record of assessments carried out through observation, conversation, digital artefacts and testing in two terms.

SUBJECT WISE ACADEMIC TRANSCRIPT							
Subject	TERM I			TERM II			GRAND TOTAL (Total I + Total II)
	CA	Mid Term Examination	Total I	CA	Annual Examination	Total II	
Dzongkha							
English							
ICT							
General Science							
Social Studies							
Mathematics							
	Percentage			Percentage			
	Position			Position			
	Attendance			Attendance			
	Total no. of students			Total no. of students			
Signature of Parent/Guardian:				Signature of Parent/Guardian:			
Signature of Class Teacher:				Signature of Class Teacher:			
The detailed criteria for the continuous assessment (CA) and the examinations for each subject should be based on the guidelines provided in the syllabus/guidebook for each subject.							

Annexure 5: Sample digital artefact with rubric

SAMPLE DIGITAL ARTEFACT

ICT Curriculum | Class VI

Title: Save the Environment - A Poster

Artefact Number: 1

Tools to use: Paint.NET

Objective: Use an image editing software (Paint.NET) to create an awareness poster on the impact of people's activity on the environment

*The task is in line with chapter 6 of class VI Social Studies on *Where Do People Live?*

what size it should be. Draw the outline on the stiff card and then cut it out. Cut out the circle in the owl's body.

You also need to make some other animals and birds. Remember, the rat has a hollow body. Draw and colour in the features. Do not forget to do both sides of the animals and birds. You will see both sides when they are hung up.

People's impact on the Environment

People's activities	Impact on environment/ people	Impact in Bhutan
Buying more cars	Air pollution; people's health	Air pollution in big towns



Figure 6.6 Impact of People on the Environment

Instruction:

1. Refer to pages 52-53 of class VI Social Studies textbook on *Impact on the environment*.
2. List the negative impacts of human activities on the environment.
3. Identify the ways to reduce the negative impacts of human activities on the environment.
4. Use image editing software to create an awareness poster on saving the environment.
Your poster should give a clear message on why and how we can save the environment.
5. Set the size of your poster at A4 with colour.

6. Add images, text and shapes, and apply good design principles to make the poster attractive and meaningful.
7. You must complete the poster within one week (the teacher may print or save the works in the digital portfolio of each student).

Assessment Rubric

Area	1	2	3	Score
Content coverage	Some of the required contents are covered.	Most of the required contents are covered	All of the required contents are covered clearly	
Design and layout	Few information on the poster is in focus and can be viewed and identified.	Most information on the poster is in focus and can be clearly viewed and identified.	All information on the poster is in focus and can be clearly viewed and easily identified.	
Use of Graphics	Few graphics is related to the content. The graphics are of low quality.	Most graphics are related to the content but some are of low quality.	All graphics are related to the content with high resolution. The pictures make it easier to understand the message.	
Clarity of the message	The poster gives a message only after looking at it closely and repeatedly.	The poster gives a message on the topic most of the time.	The poster gives a clear message on the topic instantly and makes you reflect.	
Image Editing Skill	Few tools and techniques of image editing are applied to the poster.	Some tools and techniques of image editing are applied to the poster.	Multiple tools and techniques of image editing are applied to the poster.	
Total				