FOURTH EDITION

KEYBOARD

Computer Science with Application Software

FOR GRADE 7

TEACHING GUIDE

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CONTENTS

Introduction:

In this ever-evolving world, computers have become an integral part of our daily lives, shaping the way we learn, communicate, and explore the world around us. This teacher's guide is designed to empower educators and engage young learners. It is a valuable tool for teaching computer concepts. Our teacher's guide for Keyboard 7 features:

Resource Pack for Teacher's Support

Equip educators with the tools they need to inspire and guide students effectively.

Sample Lesson Plans

Step-by-step lesson plans to ensure seamless classroom delivery, enhancing student comprehension.

Extended Activities

Dive deeper with enriching activities that encourage exploration and critical thinking.

Digital Content - Videos

Access engaging videos that bring complex concepts to life, making learning interactive and enjoyable.

Digital Content - Additional Assessments

Gauge student understanding with extra assessments, fostering a well-rounded evaluation.

Answer Key

Find clarity with a comprehensive answer key for end-of-chapter questions.

Worksheet Pack

Each chapter includes a diverse range of worksheets to reinforce learning and assess progress.

This guide is a collaborative effort, drawing insights from educational experts and the latest pedagogical approaches. It's an invaluable companion for educators embarking on the journey of nurturing young minds in the realm of computer education.

MS Word: sample file

Global Warming

Earth is warming up, and humans are at least partially to blame. The causes, effects, and complexities of global warming are important to understand so that we can fight for the health of our planet.

Global warming is the long-term warming of the planet's overall temperature. Though this warming trend has been going on for a long time, its pace has significantly increased in the last hundred years due to the burning of fossil fuels. As the human population has increased, so has the volume of fossil fuels burned. Fossil fuels include coal, oil, and natural gas, and burning them causes what is known as the "greenhouse effect" in Earth's atmosphere.

The greenhouse effect occurs when the sun's rays penetrate the atmosphere, but once the heat is reflected off the surface, it cannot escape back into space. Gases produced by the burning of fossil fuels prevent the heat from leaving the atmosphere. These greenhouse gases are carbon dioxide, chlorofluorocarbons, water vapor, methane, and nitrous oxide.

Causes of global warming

Deforestation

Plants are the main source of oxygen. They take in carbon dioxide and release oxygen thereby maintaining environmental balance. Forests are being depleted for many domestic and commercial purposes. This has led to an environmental imbalance, thereby giving rise to global warming.

Use of Vehicles

The use of vehicles, even for a very short distance results in various gaseous emissions. Vehicles burn fossil fuels which emit a large amount of carbon dioxide and other toxins into the atmosphere resulting in a temperature increase.

Chlorofluorocarbon

With the excessive use of air conditioners and refrigerators, humans have been adding CFCs into the environment which affects the atmospheric ozone layer. The ozone layer protects the earth surface from the harmful ultraviolet rays emitted by the sun. The CFCs have led to ozone layer depletion making way for the ultraviolet rays, thereby increasing the temperature of the earth.

Industrial Development

With the advent of industrialization, the temperature of the earth has been increasing rapidly. The harmful emissions from the factories add to the increasing temperature of the earth.

In 2013, the Intergovernmental Panel for Climate Change reported that the increase in the global temperature between 1880 and 2012 has been 0.9 degrees Celsius. The increase is 1.1 degrees Celsius when compared to the pre-industrial mean temperature.

Agriculture

Various farming activities produce carbon dioxide and methane gas. These add to the greenhouse gases in the atmosphere and increase the temperature of the earth.

Overpopulation

An increase in population means more people breathing. This leads to an increase in the level of carbon dioxide, the primary gas causing global warming, in the atmosphere.

Effects of Global Warming

Following are the major effects of global warming:

Rise in Temperature

Global warming has led to an incredible increase in earth's temperature. Since 1880, the earth's temperature has increased by ~1 degrees. This has resulted in an increase in the melting of glaciers, which have led to an increase in the sea level. This could have devastating effects on coastal regions.

Threats to the Ecosystem

Global warming has affected the coral reefs that can lead to the loss of plant and animal lives. Increase in global temperatures has made the fragility of coral reefs even worse.

Climate Change

Global warming has led to a change in climatic conditions. There are droughts at some places and floods at some. This climatic imbalance is the result of global warming.

Spread of Diseases

Global warming leads to a change in the patterns of heat and humidity. This has led to the movement of mosquitoes that carry and spread diseases.

High Mortality Rates

Due to an increase in floods, tsunamis and other natural calamities, the average death toll usually increases. Also, such events can bring about the spread of diseases that can hamper human life.

Loss of Natural Habitat

A global shift in the climate leads to the loss of habitats of several plants and animals. In this case, the animals need to migrate from their natural habitat and many of them even become extinct. This is yet another major impact of global warming on biodiversity.

KWL chart

KNOW	WONDER	LEARNT
Share your knowledge about the following concepts Algorithms Why are they helpful?	What do you think you will learn in this chapter? Select all that apply ❑Detail learning of computational thinking and concepts ❑Computer programming basics ❑Flowcharts ❑Game development ❑Sequence statements ❑Logical operators ❑Loops ❑Conditional statement Briefly share what you are looking forward to learning.	Share briefly about the concepts you learned.

Game Explorer Sheet

Name of your favourite game: _____

Characters: _____

_____

No. of players: _____

Strategy to win: _____

_____

_____

_____

One good feature: _____

_____

Something you would like to change: _____

_____

1 Introduction to Emerging Technologies

Lesson plan

This is an overall lesson plan for the entire chapter. Depending on the number of periods, the ideas from this lesson plan can be used to make multiple lessons.

Resources: Laptop, projector, textbook, teaching guide

Pre-requisite: An understanding of common digital tools and software applications is a must. Encouraging students to think about the future, envision possibilities, and predict how technologies might evolve can stimulate interest and anticipation.

Introduction:

Begin the lesson by asking students their understanding of the word Technology. Expected responses may be "Anything that makes work easier", "Automates tasks". Build on these responses, by asking students various technologies that they use in their daily life. Ask them how these technologies help them in carrying out day to day tasks.

Explanation:

Elaborate the term "Emerging technology" given on pg 1 of the textbook. Provide 5 to 7 minutes of discussion time to students, to brainstorm examples of any technology that they have seen emerging over time. During this activity, they may use internet for research. Gather student responses. Next provide explanations for the terms "Biometrics", "CAT" and "Robotics" given on pg 2 of the textbook. Elaborate the text given on pgs 3-5. To make efficient use of class time, it is recommended that teachers make a brief presentation of important points covered in each sub-topic and present to students. Also, teachers can search for additional examples and use them other than the ones given in the textbook.

Introduce the concept of Artificial Intelligence to students by asking them to share their understanding of the concept. Elaborate different AI concepts (Self driving cars, 3D printing, Virtual reality, Augmented reality, 3D hologram) explained in chapter given on pgs 5-9. It would be a good practice to prepare a brief presentation explaining these concepts to scaffold student learning and make efficient use of class time.

Ask students to go through text on pgs 9 and 10, focusing I/O ports of a computer system and Peripheral devices, respectively.

Digital content:

Assessments: There is a specialised assessment section of objective questions based on the entire chapter. It can be assigned to students in part after completing specific topics in class or as a whole at the end of the chapter. It can be used for reinforcement of concepts as home task or as marked assessment.

Conclusion:

At the end of the lesson, provide a brief recap of all the concepts discussed during the session.

Assessment:

Conduct formative assessment at the end of the session by writing different terms on the board or displaying them on projector. Ask students to explain them.

Answer to Exercise

Objective Type Questions

1. Choose the correct answer

a) 3-dimensional image	b) virtual world	c) displaying
d) intelligent system	e) humans	

Descriptive Type Questions

2. Answer the following questions:

a. Robotics is a branch of technology that combines engineering, technology and computer science. The field of robotics is targeted at designing systems that automate human tasks and assist them. There are various types of robots:

i. Pre-programmed robots: operate in a controlled environment where they perform simple and monotonous tasks. An example is a mechanical arm. The arm usually serves one function such as to weld a door.

ii. Humanoid robots: resemble humans and mimic their behaviour. These perform activities similar to humans such as: running, jumping and carrying objects. An example is Sophia, a Russian speaking robot.

iii. Autonomous robots: operate in open environments and perform tasks that do not require human supervision. An example is NASA's Mars Rover.

iv. Tele-operated robots: they are semi-autonomous and use wireless networks to enable human control from a safe distance. An examples is of Drone carrying a package for home delivery.

v. Augmenting Robots: enhance current human capabilities or replace the abilities that humans have lost. A robot prosthetic arm is one such example.

b. Artificial intelligence is a field of computer science that aims to create systems that can mimic human intelligence and their ability to make decisions. The advantage of having such a robust system is that it reduces the chances of human error, making processes more efficient. Examples of AI applications include: self-driving cars, virtual reality, augmented reality, 3D holograms, 3D printing, etc.

c.

Augmented reality	Virtual reality
Merger of physical and virtual world	Completely immersive virtual environment
User has a sense of presence in the real world	Visual senses are controlled by the virtual environment
No headset is needed	VR headset device is needed
Users are present in real - world while interacting with virtual world	Users are completely disconnected from real world and completely immerse themselves in the fictional world.

d. A 3D hologram works by displaying products, objects and animated sequences three-dimensionally and enables seemingly real objects or animations to appear to float completely free in space.

e. Robotics is useful to people in various ways:

i. They help to perform complex tasks with greater efficiency and less error.

ii. They can automate various monotonous tasks without exhausting, unlike humans.

iii. They can help to improve productivity and reduce costs.

iv. Since they are accurate in the ways they perform tasks, they reduce the amount of wasted material.

Application Based Questions

1. An AI-driven sorting algorithm can be useful for sorting the garbage into recyclable and non-recyclable categories. The algorithm will gather data about recyclable and non-recyclable stuff and the system will be trained on the basis of this data. This trained system will then perform the sorting task in an efficient manner.

In the Lab

Students should be encouraged to use Internet research techniques to look for emerging technologies and their advantages.

Group Project

Students should be encouraged and provided the opportunity to research different AI applications used in healthcare system. A sample response for this task is given below:

Types of AI used in Healthcare are:

Machine Learning: these algorithms can quickly process clinical documents and make predictions about medical outcomes. Can help to diagnose illness and tailor health plans to the needs of patients.

Natural Language Processing: this can be applied to medical records which helps to identify illness by extracting information from patients' health data.

Robotic Process Automation: this AI technology in healthcare is used for automating administrative tasks such as maintaining patients' medical records and billing.

2 MS Word

Lesson plan

Recommended number of periods is two. The teachers are advised to breakdown the lesson plan as per the class needs and availability of the resources. Also, it is strongly suggested that teachers spare some time at the end of the lesson for hands-on practice.

Resources: Resource file for the lesson, textbook, TG, projector.

Pre-requisite: Knowledge about application software and their benefits, familiarity with concept of files and folders, proficient in basic computer concepts such as using keyboard, mouse, searching for a program, etc.

Introduction:

Begin the lesson by asking students to ponder over the term "Digital literacy". Ask students to brainstorm and share their understanding with the class. Expected responses can be: "being able to use technology", "knowing to use computer", "tech-savvy". Build on these concepts by elaborating the term and explaining to students about the tools that they are familiar with that makes them digitally literate.

Explanation:

Explain the concept of word processing to students given on pg 12 and introduce them to the MS Word software. Inquire if students have experience using any similar tools and encourage them to share their experience. Next, display a Word file with the sample text on the projector screen. It is recommended to have sample document saved in your computer beforehand. Also, a copy of same should be saved on students' computers as well. You can use the task provided in the In the Lab section given on pg 29 exercise for the demonstration purpose. Alternatively, you can work with the resource file provided or any other sample document and assign the In the Lab exercise for homework as reinforcement.

Elaborate different features of Microsoft Word mentioned in the textbook. Depending on the class time, as well as students' pace, it is advised to split up the demonstration of the following concepts into two sessions.

Concepts to be covered in the first session:

1. Lists (bullet and numbering pg 18)
2. Fonts, font size, and text alignment (pg 19)
3. Layout tab (pg 21)

Concepts to be covered in the second session:

4. Inserting images (pgs 22 – 23)
5. Inserting table (pgs 24 -25)
6. Using thesaurus (pgs 27)

Digital content:

Videos may be assigned before studying the relevant topic or after the topic is complete as a reinforcement.

List of videos:

1. Facial Recognition

Assessments: There is a specialised assessment section of objective questions based on the entire chapter.

It can be assigned to students in part after completing specific topics in class or as a whole at the end of the chapter. It can be used for reinforcement of concepts as home task or as marked assessment.

Classwork:

Teachers can either use the following web-links to prepare a sample document for demonstration purpose or they can use text sample from students' textbook of any other subject.

Homework:

Exercise can be given as homework to students. Students should be encouraged to attempt questions on their own. Also, In the Lab exercise given on pg 29 can also be given as homework, if its not demonstrated in class.

Conclusion:

Wrap up the lesson by verbally revising and reinforcing the various features discussed in the lesson.

Assessment:

As part of formative assessment, teachers can verbally discuss objective type questions given on pg 28 with students. This will help teachers in assessing the student understanding of the concept. It is recommended to scaffold student learning by giving them appropriate prompts where needed.

After the completion of the chapter, students will have achieved the following:

1. Understand digital literacy concept
2. Understand word processing tools
3. Apply bullets and numbering to the text where needed
4. Work with different font styles and text alignments
5. Insert tables where needed to organize text in meaningful manner
6. Understand how the thesaurus feature works

Support resources:

Teachers can take sample text from the following resources:

https://education.nationalgeographic.org/resource/global-warming/

https://www.nationalgeographic.com/environment/article/global-warming-overview

Answer to Exercise

Objective Type Questions

1. Choose the correct answer

a) F1	b) a vertical arrangement of text	c) ctrl+L
d) 1 inch	e) Page layout	

Descriptive Type Questions

2. Answer the following questions:

(The student responses can be different from these; however, the teachers must ensure that the concept remains same)

a. Empty spaces around the page are called page margins.

b. The four types of alignments are as follows:

i. Left Align

ii. Right Align

iii. Centered Align

iv. Justify

c. Thesaurus feature is useful because:

i. It helps to improve writing skills

ii. It allows to look for synonyms and antonyms

d. To insert image, follow the steps below:

i. Click on Insert tab

ii. Click on Picture icon. This will open a window from where images can be selected

iii. Locate the folder where the desired image is saved

iv. Select the image by double-clicking on it or a single right-click, then press Insert button at the bottom of the window.

e. Serif fonts have tiny lines that extend off the letter, such as Times New Roman font. Sans is a Latin word, which means "Without". Given this, Sans Serif fonts do not feature tiny lines as opposed to Serif fonts. Arial font is an example of Sans Serif font.

Application Based Questions

Encourage students to perform this activity at home and bring it with them during the next class or submit to you via email.

In the Lab

This task can either be performed during the lesson, or can be given as homework for reinforcement and practice. In case, this activity is performed in class, ask students before the lesson to write an essay on Global Warming beforehand so that class time can be utilized efficiently.

Group Project

It is recommended to encourage students to research in detail the given problems and their solutions. The research can be carried out in any of the following ways:

1. Interview technique – they can organize interview sessions with teachers, adults or any potential organization and gather information.
2. Use internet for research
3. Magazines and newspapers

A sample for teachers' guidance is given below:

Problems	**Solutions**
Illiteracy	Make education free and compulsory for all kids Have better constructed schools with well-trained staff to make education accessible for all Enable distance education for people who cannot physically have access to it such as on-airing educational programs on TV
Pollution	Avoid using plastic bags Use public transport Turn off lights when not in use Plant more trees
Broken roads	Arrangements for proper city planning Marked and visible pedestrian crossings Warning signs for construction Regular road maintenance

3 MS PowerPoint

Lesson plan

Recommended number of periods is two. The teachers are advised to break down the lesson plan as per the class needs and availability of the resources. Also, it is strongly suggested that teachers spare some time at the end of the lesson for hands-on practice.

Resources: Sample ppt file, textbook, teaching guide, projector

Pre-requisite: Knowledge about application software and their benefits, familiarity with concept of files and folders, proficient in basic computer concepts such as using keyboard, mouse, searching for a program, etc. Students also have a sound understanding of using MS Word software; this will help students to work easily with MS PowerPoint.

Introduction:

Begin the lesson by using recall strategy and asking students their understanding of MS Word software. Ask students: "Can you recall what MS Word is used for?", "How does it make your work easy?" Build on these responses and introduce them the concept of Multimedia Presentation given on pg 30. Help students understand difference between MS Word and MS PowerPoint. Teachers are recommended to search for this information in advance. For additional support, a sample table highlighting differences between MS Word and PowerPoint is given at the end of the lesson plan. Teachers can also use this information to support student understanding.

Explanation:

To explain the different features of MS PowerPoint, it is recommended that teachers have a sample presentation ready beforehand to use it for demonstration purposes. Also, a copy of same should be present on student computers as well. Teachers must ensure that students get time for hands-on practice as well.

Elaborate the demonstration of the concepts mentioned in the textbook. Depending on the class time, as well as students' pace, it is advised to split up the demonstration of the following concepts into two sessions.

Concepts to be covered in the first session:

1. PowerPoint interface – pg 31
2. Opening a presentation – pg 31
3. Zoom and view buttons – pg 32
4. Slide show, reading view, slide sorter, normal view – pg 32
5. Adding objects to the slide – pg 33
6. Smart art – pg 34

Concepts to be covered in the second session:

1. Tables - pg 34
2. Graphs and charts – pg 34

3. Animation–pg 35 and 36
4. Creating a slideshow and an executable file – pg 36

Classwork:

Teachers can use the following web-links to prepare a sample presentation and use that for demonstration in class. Students should be provided with a copy of same for practice.

Homework:

The following tasks can be given as take home activity:

1. Descriptive question
2. Application based question
3. Group project

Support resources:

https://www.un.org/en/climatechange/science/causes-effects-climate-change

https://palmetto.com/learning-center/blog/what-is-climate-change-definition-causes-effects

https://solarsystem.nasa.gov/planets/overview/#otp_planets_of_our_solar_system

Digital content:

Assessments: There is a specialised assessment section of objective questions based on the entire chapter. It can be assigned to students in part after completing specific topics in class or as a whole at the end of the chapter. It can be used for reinforcement of concepts as home task or as marked assessment.

Conclusion:

Wrap up the lesson by providing a recap of the concepts discussed in the class. Teachers can ask students to demonstrate different concepts in front of the whole class.

Assessment:

As part of formative assessment, teachers can verbally discuss objective type questions given on pgs 38-39 with students. This will help teachers in assessing the student's understanding of the concept. It is recommended to scaffold student learning by giving them appropriate prompts where needed.

After the completion of the chapter, students will have achieved the following:

1. Understand the concept of multimedia presentation.
2. Differentiate between word processing and multimedia software.
3. Familiarize with zoom, slideshow, reading view, slider sorter and normal view.
4. Insert different types of multimedia in presentation such as: content, table, images, smart art, video.
5. Insert graphs and tables in presentation for better representation of data.
6. Understand the purpose of and use different types of animation: entrance, emphasis, exit and motion paths.
7. Creating a slideshow and executable file.

Answer to Exercise

Objective Type Questions

1. Choose the correct answer

a) slide layouts	b) view all of the effects on the current slide c) reorder effects d) preview effects	e) an animation that moves and object along a path
f) true	g) from beginning	

Descriptive Type Questions

2. Answer the following questions:

a. PowerPoint presentation software allows to make multimedia presentation. It allows to make presentation interactive by adding objects, e.g. images, sounds, tables, video clips and tables, etc.

b. The reading view allows to view presentation with better visibility. It allows to read the presentation before going into slideshow.

c. To add graphs, follow the steps below:

a. Click on the insert tab. Select the Chart icon.

b. This will open a window with dummy data and graph.

c. Replace this dummy data with your own data to create a graph of your own.

d. Following are the three types of smart art graphics:

a. List: shows non-sequential information. Use this smart art graphic when its needed to present list items in a visual manner.

b. Cycle: it is used to show a continual process.

c. Process: it is used to visually represent sequential information or steps in a process.

e. To save the PowerPoint presentation file follow the steps below:

a. Click "Save As" from the File menu or use the shortcut key F12.

b. After clicking on "Save As", select "PowerPoint Show" from the dialog box that appears.

C. Click "Save."

Application Based Questions

Encourage students to design brochure on PowerPoint using the skills they have learnt in the chapter.

In the Lab

For this task, to make efficient use of class time, ask students to look for information about Climate Change beforehand. This activity can also be performed in class during the demonstration.

Group Project

Encourage students to perform this activity as a homework assignment

4 The Internet as Post Office

Lesson plan

Recommended number of periods is two. The teachers are advised to break down the lesson plan as per the class needs and availability of the resources.

Resources: Textbook, teaching guide, projector, a sample Gmail ID.

Pre-requisite: Familiarity with using internet, search engines, searching information on internet.

Introduction:

Begin the lesson by asking students about their understanding of the internet and communication. Use an inquiry-based strategy to guide and support student responses. For instance, you may ask students: Why do you think internet is used? How does internet make communication easy? Which platforms/apps/websites do you use to communicate with your friends and family? Have you every used email?

Explanation:

Once you have assessed students' understanding about internet in general and email in particular, introduce them to various terms related to internet. Refer to pgs 40 and 41 of the textbook and elaborate the concepts given. It would be good practice to have some sample website opened on the projector as well. You can open https://oup.com.pk and explain the terms by referring to the website. For example, highlight the URL given in the address bar, and explain to students that this is where they can find the URL for any website.

Explain email protocols to students as given on pgs 42 and 43. Help them understand why email protocols are important. Ask students to read through the advantages of the email given on pgs 43-44 and share their understanding.

Login to your sample Gmail ID. It is recommended that teachers have a sample Gmail ID made so that they can use it in class for demonstration purposes. Teachers are advised not to use their personal IDs for demonstration. Explain the various features of email given on pgs 44 and 45. Demonstrate to students how they can draft and format an email and send attachments with it.

As a wrap up activity or take-home task, ask students to create their own email on Gmail and send you an email specifying what they learnt in class. Ask them to attach a word document with the email as well that should mention the challenges they faced during the learning.

Concepts to be covered in the first session:

1. Internet terms and addresses – pgs 40-41
2. Email services and email protocols – pgs 42 – 43
3. Advantages of email – pgs 43-44
4. Email addresses and email folders – pgs 44
5. Commands of working with email – pgs 45
6. Composing and sending an email – pgs 50 - 52

Concepts to be covered in the second session:

1. Creating an email account – pg 46

2. Tone and language of an email – pg 48
3. Ways to stay safe – pg 49
4. Email signatures – pg 54
5. Using search engine to find information (recap) – pg 54

Digital content:

Assessments: There is a specialised assessment section of objective questions based on the entire chapter. It can be assigned to students in part after completing specific topics in class or as a whole at the end of the chapter. It can be used for reinforcement of concepts as home task or as marked assessment.

Conclusion:

Wrap up the lesson by providing a recap of the concepts discussed in the class. Teachers can ask students to demonstrate different concepts in front of the whole class.

Assessment:

As part of formative assessment, teachers can verbally discuss objective type questions given on pg 55 with students. This will help teachers in assessing the students' understanding of the concept. It is recommended to scaffold student learning by giving them appropriate prompts where needed.

Answer to Exercise

Objective Type Questions

1. Choose the correct answer

a) uniform resource locator	b) surfing	c) attachment
d) @	e) communication	f) both A and B
g) Cc	h) all of the above	i) all of the above
j) use the options in the format menu.		

Descriptive Type Questions

2. Answer the following questions:

a. mil: is the domain assigned to URL owned by U.S. military.

net: it stands for network, it is used by businesses that provide services like internet or web-hosting.

jp: is the internet country code for Japan.

cc: is the internet country code for Cocos (Keeling) Islands.

b. In the case of number addressing system, the address is characterized by numeric address called the internet protocol address (IP). Example of an IP address includes: 192.12.148.73

c. The sent folder stores emails that are sent to the users. The draft folder stores the emails that the user has started to write but not yet sent.

d. A signature is the text, usually a sender's contact information that is automatically inserted at the bottom of every email message. To insert signatures in Gmail, follow the steps below:

i. Click the settings icon, at the top right corner of the Gmail window.

ii. The Settings window appears, scroll down to the Signature section and type the text you would like to include in your signature. You can also format the text as per your choice using text formatting tools.

iii. Click Save Changes at the bottom of this page.

e. The standard email protocols are described below:

i. POP protocol: POP stands for Post Office Protocol. This is one-way protocol in the sense that it retrieves the messages from the email server and downloads them on the user's computer. The emails are accessible offline and are deleted from the server.

ii. IMAP protocol: it stands for Internet Message Protocol, deals with managing and retrieving email messages from the receiving server.

iii. SMTP: it stands for Single Mail Transfer Protocol. It is the email protocol that is used to transfer emails between email client and servers. It is the industry standard protocol used for sending emails.

Application Based Questions

1. a) Ghzanfar should use the Bcc feature of the email. He should enter all emails in BCC list. It stands for Blind Carbon Copy. By doing so Ghazanfar will be able to send the invite to multiple people without letting them know that others have received the same email.

b) Assuming that Ghzanfar is using Gmail, he can send an attachment by clicking the attach button in the compose window. The attach button is symbolized by a paperclip icon. After clicking the attach button, file explorer window will open from where he can select the invite file. The selected file is then added as attachment, ready to be sent with the email.

c) Yes, he can format the email text as per his choice by clicking the text formatting icon. The text formatting icon will allow him to change the font style, size and colour of the font.

2. a) Sending invites through email is faster than sending through courier.

b) Sending invites through email is cost-effective. Another advantage is that it is accessible from everywhere, so in case the recipient does not receive the invite at their home, they can access it from their email.

In the Lab

For both the questions, ask students to use the email addresses they created in lab.

Group Project

1. Encourage students to use their learnings of MS PowerPoint, and prepare a presentation.

2. Some safety tips are:

i. Do not reply to spam or forward chain emails.

ii. Do not open attachments sent from unknown email addresses.

iii. Do not share sensitive information over email such as bank account information, or personal address.

iv. Enable filters on your inbox so that spam emails are directed to spam folder.

v. Have an antivirus installed so that if any suspicious attachment is downloaded your system can prompt you.

5 Algorithmic Thinking and Problem Solving

Lesson plan

Recommended number of periods is two. The teachers are advised to break down the lesson plan as per the class needs and availability of the resources.

Resources: Textbook, teaching guide, projector, KWL chart, computational thinking activity sheet.

Pre-requisite: Basic understanding of problem statement. Concepts covered in book – *6, chapter 4*

Introduction:

Students have covered basic concepts of algorithms in Keyboard 6 chapter 4. This chapter builds on those concepts and extends them further.

Begin the lesson by using recall strategy. For this, distribute the KWL chart given in the resource pack. Give 5 minutes to students to fill the Know and Wonder section of the KWL chart. Ask them to leave the Learnt section for now as it will be filled at the end of the lesson.

After 5 minutes, ask students to share their knowledge about algorithms. For example you may ask them: "What do you remember about algorithms?" "Why do you think they are used?" "Can you give any daily life example?" Ask students to share their learning expectations. Let them share what they think they will learn in this chapter. Expected response can be: "more examples of algorithms" "how to write computer programs using algorithms".

Explanation:

Explain to students in detail the concept of computational thinking and its process by referring to the text given on pg 57 and 58. As part of explanation, you can show students the video on Computational Thinking for better understanding of concepts.

Ask students to read through Algorithms and Basic constructs in an algorithm given on pgs 59-60 and share their understanding.

Introduce them to the concept of flowcharts given on pg 60. As an example, explain them process of making tea and its corresponding flow chart.

Ask the students to draw a flow chart for the algorithm given on 63. Once they are done, ask them to compare their flow chart with the one given in the textbook. Next, ask students to complete the flow chart given in the In the Lab section on pg 69.

Elaborate the concept of Conditional statements (pg 64), Loops (pg 64-65) and Functions (pg 66). Also make sure to explain all the example algorithms to students given in the textbook.

Digital content:

Videos may be assigned before studying the relevant topic or after the topic is complete as a reinforcement.

List of videos:

1. Building blocks of Algorithms

Assessments: There is a specialised assessment section of objective questions based on the entire chapter. It can be assigned to students in part after completing specific topics in class or as a whole at the end of the chapter. It can be used for reinforcement of concepts as home task or as marked assessment.

Conclusion:

Wrap up the lesson by providing a recap of the concepts discussed in the class. Teachers can ask students to demonstrate different concepts in front of the whole class.

Assessment:

As part of formative assessment, teachers can discuss objective type questions given on pg 67-68 with students. This will help teachers in assessing the student's understanding of the concept. It is recommended to scaffold student learning by giving them appropriate prompts where needed.

After the completion of the chapter, students will have achieved the following:

1. Familiarize with computational thinking and its process.
2. Understand the concept of algorithms.
3. Apply the steps/process of computational thinking such as: decomposition, abstraction, pattern recognition when solving problems.
4. Define flowcharts.
5. Identify the symbols used in flowcharts.
6. Draw flowcharts for the given algorithms and vice versa.
7. Use conditional and looping statements when writing algorithms or making flowcharts.
8. Identify different types of errors in programming such as logical errors, syntax error and run-time errors.

Classwork:

- In the lab – pg 69
- Objective type questions – pg 67

Homework:

1. Descriptive question – pg 68
2. Application based question – pg 68
3. Group project – pg 69

Answer to Exercise

Objective Type Questions

1. Choose the correct answer

a) coding	b) decomposition	c) attachment looking for similarities among and within problems
d) all bicycles have wheels	e) step by step instructions to solve a problem	f) graphical representation of a problem
g) similar	h) abstraction	i) abstraction
j) by arrows		

Descriptive Type Questions

Answer the following questions:

a. Logical errors: these errors occur when a program runs correctly but does not yield the expected output. For example, the user expects the outcome of 2+2*2 to be 8. However, the result computed will be 6. The program will execute the instruction correctly, however, the result will not be same as expected by the user.

b. The algorithms are important because:

a. They are building blocks for computer programs.

b. They allow a way for programmers to detect most errors early on and save effort when writing actual computer program.

c. They help to break down problems into discrete steps.

d. They provide an efficient way of solving problems.

c. The process of pattern matching allows us to see the small parts of the problems for patterns or similarities. Looking for these similarities in problems or data, provides an effective way of solving problem. An example of pattern matching is converting measurements or other mathematical formulas such as temperature formula for calculating circumference of circle.

d. Syntax errors: these are similar to grammatical errors that we make. These occur when the programmer does not follow the correct punctuation as described by the programming language being used.

e. Function is defined as a piece of code that can be used repeatedly and returns a value. For example, they are used perform a specific task. It is a reusable block of code that is used to perform a specific task. For instance, a program can have a function for determining even or odd numbers or prime numbers.

Application Based Questions

1. a) condition that is checking if animal is classified as carnivore: Does it eat only plants.

b) Step1: INPUT animal_name

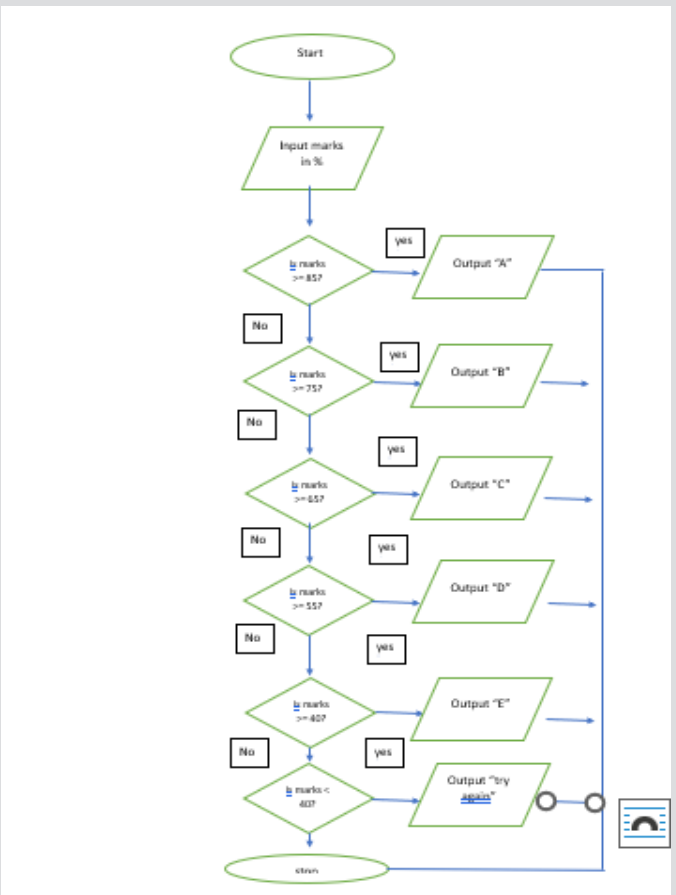
Step 2: IF animal_name = "lion"

Step 3: PRINT "carnivore"

Step 4: ELSE

Step 5: PRINT "Animal is not lion."

c) If the condition DOES IT EAT PLANT=YES the animal is herbivore



In the Lab

1. start
2. select a school
3. are seats available?
4. Do you have to take an admission test?
5. Sit for an admission test
6. Check result
7. If passed submit documents
8. End

Group Project

Teachers must encourage students to plan an activity or they can take the opportunity of using any field trip organized by school or any event of similar nature to attempt this task.

6 Binary Computing

Lesson plan

Recommended number of periods is two. The teachers are advised to break down the lesson plan as per the class needs and availability of the resources.

Resources: Textbook, teaching guide, projector.

Pre-requisite: Computational thinking, algorithmic thinking.

Introduction:

Begin the lesson by asking students to recall and share the knowledge of the concepts such as computational thinking and algorithmic thinking. At this point, it is crucial for students to understand the concept of data and its form. Explain the definition of data to students given on pg 70.

Next, write an algorithm on the board. A sample algorithm is given below:

Step 1: Ask first Number

Step 2: Ask for second Number

Step 3: Add first Number and second Number

Step 4: Print result: "Result is"+ Result

Step 5: End

Ask students to identify what type of information is required for this algorithm. You may ask: "What data is required?" Expected responses can be: "numbers". Next, you can ask: "Can you identify the text in this algorithm?" Build on these responses and explain to students various types of data given on pg 70.

Explanation:

Introduce the concept of binary computing to students. Explain the binary states of data and the binary states given on pgs 71 – 72 to students. Extend this explanation further by showing students the video on How Computers Work. Play the video till 1:47 and ask students to share their understanding.

Next, explain the number systems to students in detail given on pg 72. To elaborate the concept further, continue playing the video from 1:47 to 3:14. For the first session, keep the discussion confined to Binary addition (pg 73) and binary subtraction. Once you have covered this, give some practice addition and subtraction problems to students.

For the next session, elaborate Binary to Decimal conversion and Decimal to Binary Conversion given on pgs 75 and 76, respectively. To support learning further, continue playing the video How computers Work. Explain different binary codes to students (EBDIC, ASCII and Unicode) by elaborating the text given on pgs 78-80. Next explain how images and sounds are stored as data in computer by referring to the text given on pgs 80-83. Make sure to allocate some practice time at the end of the lesson. Ask students to attempt application based questions given on pg 84.

Digital content:

Assessments: There is a specialised assessment section of objective questions based on the entire chapter. It can be assigned to students in part after completing specific topics in class or as a whole at the end of the chapter. It can be used for reinforcement of concepts as home task or as marked assessment.

Conclusion:

Wrap up the lesson by providing a recap of the concepts discussed in the class.

Assessment:

As part of formative assessment, ask students to attempt application based questions on pg 84. After the completion of the chapter, students will have achieved the following:

1. Define data and information.
2. Analyze how computer processes data.
3. Identify different forms of data such as numeric, text and alpha numeric
4. Define number systems
5. Apply different number systems such as binary to decimal and decimal to binary
6. Understand different coding methods such as EBDIC, ASCII and Unicode
7. Understand how computer stores images and sound data

Classwork:

- Application based questions pg 84

Homework:

1. Objective questions – pg 83-84
2. Descriptive question pg 84
3. In the lab 85
4. Group project pg 85

Answer to Exercise

Objective Type Questions

1. Choose the correct answer

a) pixels	b) 00	c) 1,0 respectively
d) 65	e) change both 0s and 1s	f) something given
g) Digital	h) information structure cycle	i) 10
j) 2		

Descriptive Type Questions

Answer the following questions:

a. Binary data is represented in the form of 0s and 1s, where 1 represents ON state and 0 represents OFF state. The computers run on electricity, and the circuits in the CPU are similar to wires that carry signals in the form of electric current. Due to this, these signals can only be in one of the two forms, either 0 or 1. For instance, whenever key is pressed, an electronic signal is sent to CPU and stored.

b. The steps to convert from binary to decimal is given as:

1. The binary number system is represented by either 0 or 1.
2. To convert binary to decimal, multiplication method is used.
3. In the conversion process, each digit of the given number is multiplied from most significant bit to least significant bit, while reducing the power of base.

c. The number systems are explained and differentiated below:

EBDIC: it uses 8 bits to represent a symbol in the data.

ASCII: characterized by a code where each number represents a character; it can be used to convert text to binary.

Unicode: used for the representation of text, including letters, numbers and symbols in multi-lingual environments.

d. Number system is a way to represent numbers. For example, number 10 can be represented in binary form as 1010.

e. Computers convert text data to binary with an assigned ASCII value. Once the ASCII code for an alphabet is known, it can be converted to its equivalent binary code.

Application based question:

1. 10110= 22
2. 7
3. 42
4. 48=110000 b) 86=1010110 c) 97 = 1100001 d) 29 = 11101

In the Lab

Ask students to refer to the ASCII table on pg 79 and attempt this.

Group Project

KEYBOARD

7 Scratch Game Development

Lesson plan

Recommended number of periods is two. The teachers are advised to break down the lesson plan as per the class needs and availability of the resources.

Resources: Textbook, teaching guide, projector, Scratch 3, Game Explorer sheet.

Pre-requisite: Computational thinking and algorithmic thinking, familiarity with scratch programming interface.

Introduction:

Begin the lesson by providing a brief recap of Scratch programming software. Ensure that the software is downloaded on all student PCs. Briefly tell students about basic features such as the placement of different coding blocks and how to change sprite.

Next, provide Game Explorer sheet to students. Ask them to share their experience of their favourite game by filling in the sheet.

Explanation:

This chapter will help students in creating a maze game and requires a substantial amount of hands-on experience. Demonstrate the steps for creating a maze game. For the first session, cover the following steps:

1. Programming the movement of game characters – pg 87
2. X and y coordinates – pg 88
3. Adding movement code to the player – pg 89
4. Duplicate the movement code for the cat sprite – pg 90
5. Code the maze – pg 91

In the second session, cover the following steps:

1. Check whether the cat is colliding with maze sprite – pg 92
2. Create the apple sprite – pg 93
3. Score variable – pg 93
4. Countdown timer – pg 94 – 95

It is strongly advised that teachers should spare time for students to practice at the end of the each session.

Digital content:

Assessments: There is a specialised assessment section of objective questions based on the entire chapter. It can be assigned to students in part after completing specific topics in class or as a whole at the end of the chapter. It can be used for reinforcement of concepts as home task or as marked assessment.

Conclusion:

Wrap up the lesson by providing a recap of the concepts discussed in the class.

Assessment:

At the end of the lesson, students would have achieved the following learning outcomes:

1. Apply programming constructs such as Loops, conditional and sequential statements to program games.
2. Adding different game elements to make interactive games.
3. Apply the concept of combining events and coordinates to allow a user to move a sprite **automatically** without user intervention.

Classwork:

- Maze game example given in textbook.

Homework:

1. Descriptive question – pg 97
2. Application based question – pg 97
3. In the lab – pg 97
4. Group project – pg 97

Answer to Exercise

Objective Type Questions

1. Choose the correct answer

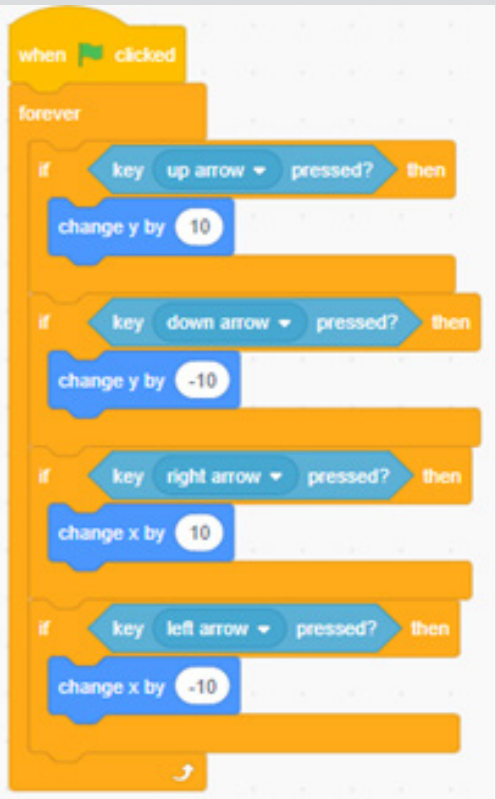
a) a programming language	b) an object that can be programmed to move and interact with other objects	c) a pre-written piece of code that can be easily dragged and dropped into the programs
d) by using the REPEAT block	e) all of the above	f) multiple characters
g) any sprite	h) X position	i) 180,-180
j) origin		

Descriptive Type Questions

Answer the following questions:

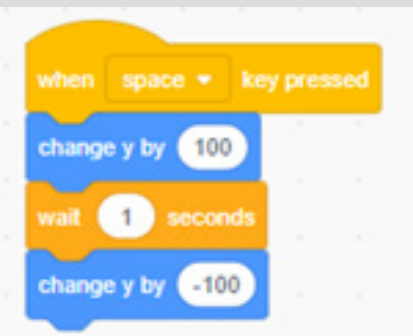
a. To create a new sprite in scratch, click on Choose a Sprite. From here, you can either select a sprite from the library or click on paint option to paint a sprite of your choice.

b. First click on the sprite you want to move, then add the following code:



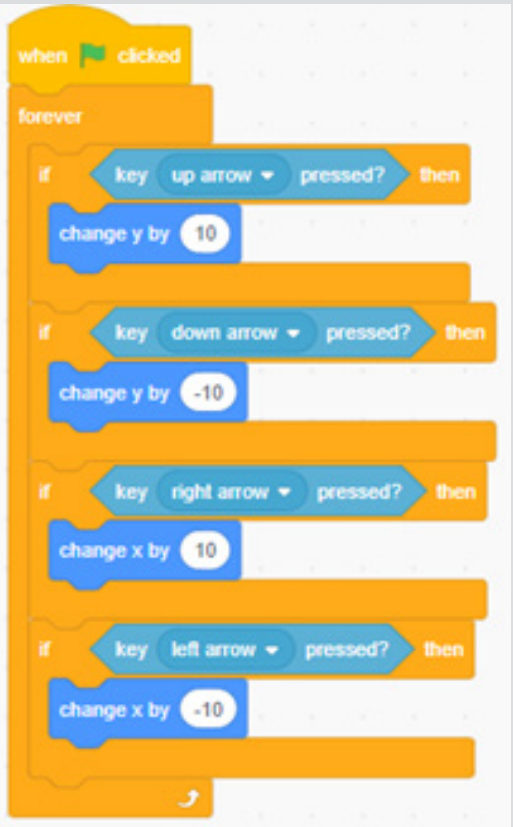
c. There are two ways to change the background in Scratch. In the first method, the background can be changed manually by selecting the "Choose a backdrop" button and either selecting a backdrop, uploading one or painting a backdrop of one's choice. In the second method, select the "switch backdrop" block from the Looks block.

d. The simplest code for jumping is given below:



e. The sound can be added by selecting play sound block or start sound block from the sound block palette depending on the requirements of the program.

1. The sound block provides various options to add sound either from the list of existing sound or recording sound of your own choice.
2. The x and y coordinates define or indicate the location of sprite on the stage. They are important as they help to program the movement of sprite when developing games.
3. To add the movement code for a player, follow the steps below:
   i. Open a new file of scratch editor and enter a title for your game.
   ii. Add a new sprite if you wish to or continue working with the default sprite.
   iii. Add the movement code given below. The code blocks are used from various block palettes such as Events, Control, Sensing and Motion.
   iv. The forever loop is important as it repeatedly checks whether the arrow keys are being pressed or not.



d. To use the images in the maze, it is important to have the maze first uploaded as the backdrop. Then add the sprite Cat and Apple to the maze and make sure to change their size so that they fit in the image. The size can be changed by using the set size block from the looks block palette.

Application Based Questions

1. Teachers must encourage students to sketch the algorithm for this game. As a sample, ask students to watch the following resources which may help them in making the algorithm.

https://www.youtube.com/watch?v=VwprgkKxkJI&list=RDCMUCzPI8bZBZZIL5eftCCxEN1g&index=1&ab_channel=GeekTutorials

A sample algorithm is given below:

1. Program the sprite to move around the maze.
2. Insert the maze as a separate sprite
3. Insert another sprite as enemy
4. Program the movements of the enemy sprite.
5. Program both the sprites to avoid the walls
6. Put some reward for the sprite (non-enemy) after completing the maze

In the Lab

To develop this game, the following tutorial can be helpful:

https://www.youtube.com/watch?v=VwprgkKxkJI&list=RDCMUCzPI8bZBZZIL5eftCCxEN1g&index=1&ab_channel=GeekTutorials

Use the Explore option of scratch to look for various sample games. One example is given: https://scratch.mit.edu/projects/304289996/

Group Project

The flappy bird game can be accessed from the pre-made project library it, https://scratch.mit.edu/projects/17828009/. Ask students to fully explore this game by playing it, accessing its code and then developing an algorithm for it.

8 C Programming

Lesson plan

Recommended number of periods is two. The teachers are advised to break down the lesson plan as per the class needs and availability of the resources.

Resources: Textbook, teaching guide, projector

Pre-requisite: Computational thinking, algorithms, conditional statement, loops, sequential statements, variables, flowchart, binary computing.

Introduction:

The initial topics of this chapter are revision and reinforcement of the concepts studied in previous chapter. Keeping this in view, begin the lesson by using reinforcement strategies. Encourage students to share their understanding of various concepts they have learnt, such as: algorithms, programming language (students will most likely share their knowledge about Scratch programming), flowcharts, etc.

Use inquiry to support recall and guide student learning. For instance, you may ask: "What do you think Scratch is used for? Are there any similar languages you know of?" "Do you remember what language computers understand?" Scaffold students learning through cues where needed.

Explanation:

Once you have gauged the student learning through recall and inquiry, introduce them to the concept of low-level and high-level language by elaborating the text given on pgs 98 and 99. Explain in detail the concept of an IDE. You can use an online C compiler for demonstration purposes.

Make sure to write a sample C program in the compiler, and explain in detail the sections of each program. You can demonstrate the working of the sample program given in fig 8.2 (pg 102) in the textbook. Elaborate and demonstrate how to write a program in C. Explain the concept of keywords to students, given on pg 107.

For the first session, keep the discussion confined till the concept of Keywords. Spare 10 minutes of class time to let students practice the sample code given in textbook. You can ask students to use the online editor to work.

In the second session, explain the concept of data types (pgs 107-109) and variables (pgs 109-111) to students in detail. Also, demonstrate the working of programs given on pgs 110 and 111. It is recommended that teachers change values and some other parameters of the given codes , explaining to students how altering the sequence of the code or input values impact the output.

Ask students to practice the programs demonstrated in class and the codes given on pgs 112 and 113. While they are practicing, teachers must monitor students' work closely. Also, it is suggested that teachers use inquiry to gauge whether the students are able to apply logical thinking (making sense of the logic of the code) when writing the codes. In case students find it challenging, teachers must help them in understanding the logic as well.

Digital content:

Videos may be assigned before studying the relevant topic or after the topic is complete as a reinforcement.

List of videos:

1. Coding in C language

Assessments: There is a specialised assessment section of objective questions based on the entire chapter. It can be assigned to students in part after completing specific topics in class or as a whole at the end of the chapter. It can be used for reinforcement of concepts as home task or as marked assessment.

Conclusion:

Wrap up the lesson by providing a recap of the concepts discussed in the class.

As part of formative assessment, discuss objective type questions given on pg 115 in the textbook.

Assessment:

At the end of the lesson, students would have achieved the following learning outcomes:

1. Differentiate between high-level and low-level language.
2. Understand the structure of C language
3. Write programs in C language.
4. Apply programming constructs such as Loops, conditional and sequential statements to write computer programs.
5. Understand data types used in C language.
6. Apply appropriate data types when writing programs.
7. Create and use variables when writing programs.
8. Analyze the ways to debug programs
9. Apply logical and computational thinking when writing programs

Classwork:

- Objective type questions
- Examples given in textbook for practice.

Homework:

1. Descriptive question – pg115
2. In the lab – pg 115

Resources:

Teachers can use the following online editors for demonstration purposes:

1. https://onecompiler.com/c
2. https://www.onlinegdb.com/

Answer to Exercise

Objective Type Questions

1. Choose the correct answer

a) 32	b) all of the above	c) int $main
d) the function that is called first when the program runs		

Descriptive Type Questions

Answer the following questions:

a. A computer program is a set of instructions, written in a language as understood by the computer. This set of instructions is called a code.

b. There are three types of languages:

i. **Low-level language:** these are also referred to as machine codes. There are two types of low-level languages:

Assembly language: the instructions are given to computer in form of mnemonics such as MOV, ADD, etc. These require an assembler to convert it into machine language to be understood by the computer.

Machine language: it is the code written in 0s and 1s.

ii. **Intermediary language:** it is generated from programming source code, but cannot be executed by CPU.

iii. **High-level Language:** these are written in a form understood by programmer, and then are interpreted or compiled in the form understood by computer at the time of execution. These languages provide an efficient way to write programs. Examples include C, BASIC, JAVA, etc.

c. A compiler converts a program written in high-level language to a low-level language – machine language. An interpreter does pretty much the same, except that it interprets the program line by line. Assemblers are used to convert assembly language programs into machine language.

d. Functions provide a way to reuse code. For example, if you are writing a program for a calculator, you can create functions for each task, such as addition, or finding the circumference of a circle. Having functions in program allows to write the block of code once and reuse it whenever needed, instead of rewriting the entire code again and again.

e. Encourage students to refer to the program given in fig. 8.15 on pg 111. Ask students to change the variable names and enter values as per their choice.

f. A program using for loop, is given below. The program prints the numbers 1 to 10. You may ask students to generate a series of numbers ranging from 1 to 100 or 1 to 10000.

```
// Print numbers from 1 to 10
#include <stdio.h>
int main() {
int i;
for (i = 1; i < 11; ++i)
{
printf("%d ", i);
}
return 0;
}
```

g. The six sections of C program are:

i. Documentation: consists of a set of comment lines giving a name to the program, the author or any other detail that the programmer (author) wants to mention.

ii. Links: declares the header files that will be used in the program. This code tells the header compiler to link the header files to the system libraries.

iii. Definition section: defines all the symbolic constants such as: #define PI 3.14;

iv. Global declaration: defines the variables used in more than one function. Such variables are called global variables. It also contains user defined functions.

v. Main() function: it has two parts: the declaration part that declares all the variables used in executable part, and the executable part where there is at least one statement. The program execution begins at the opening brace and ends at the closing brace.

vi. Sub-routine section: if the program is carrying out more than one function, then the subprogram contains all the user-defined functions that are called in the main ( ) function.

In the Lab

The algorithm to bake brownies is given below. (Student responses may vary.)

- Step 1: Gather the Ingredients
- Step 2: Preheat the Oven
- Step 3: Prepare the Brownie Batter
- Step 4: Bake the Brownies
- Step 5: check if brownies are baked
- Step 6: GO TO STEP 4 if not baked
- Step 7: Cool and Enjoy

9 Visual Basic

Lesson plan

Recommended number of periods is two. The teachers are advised to break down the lesson plan as per the class needs and availability of the resources.

Resources: Textbook, teaching guide, projector, Digital Life 101 handout

Pre-requisite: Computational thinking, algorithms, conditional statement, loops, sequential statements, variables, flowchart, binary computing, C programming.

Introduction:

Begin the lesson by asking students to recall the concepts they learnt in chapter 8. Use inquiry to support recal, for example you may ask: "What data types did you use in C language?", "How did you use variables in C language?" Also, ask their understanding about algorithms and programming constructs.

Explanation:

Explain to students that the logic and concepts, such as data types and variables, remain the same for all the languages. Computer languages differ only in their structure or syntax. Elaborate the concept of GUI (Graphical User Interface) and IDE (Integrated Development Environment) given on pgs 116 and 117, respectively. Next, demonstrate how to install the Visual Studio IDE by referring to the steps illustrated in the textbook on pgs 118-119. While demonstrating, ask students to follow along and install the VS (Visual Studio) setup. At this point, assist students in screen recording their installation steps. You may install a screen recording software beforehand.

Next, demonstrate the various features of the IDE as illustrated in the textbook on pgs 120-122. Spare sufficient time at the end of the lesson for students to practice and get familiar with the IDE. Students must practice the example codes provided in the textbook.

Digital content:

Assessments: There is a specialised assessment section of objective questions based on the entire chapter. It can be assigned to students in part after completing specific topics in class or as a whole at the end of the chapter. It can be used for reinforcement of concepts as home task or as marked assessment.

Conclusion:

Wrap up the lesson by providing a recap of the concepts discussed in the class.

Assessment:

At the end of the lesson, students would have achieved the following learning outcomes:

1. Write programs in VB.

2. Apply programming constructs such as Loops, conditional and sequential statements to write computer programs.
3. Understand data types used in VB.
4. Apply appropriate data types when writing programs.
5. Create and use variables when writing programs.
6. Analyze the ways to debug programs
7. Apply logical and computational thinking when writing programs

As part of formative assessment, discuss the objective type questions given in the Exercise.

Classwork:

- Objective type questions – pgs 126-127
- Application based questions – pg 128

Homework:

1. Descriptive question – pg 127
2. In the lab – pg 128

Answer to Exercise

Objective Type Questions

1. Choose the correct answer

a) to create windows application	b) Built in functions	c) string	d) iii and iv	e) phone number	f) event driver	g) to create a new variable
h) thread	i) Variant	j) to create a new variable				

Descriptive Type Questions

Answer the following questions:

a. To create a new project in VB:

i. Open Visual Studio

ii. On the start window create a new project

iii. On this window, select Windows Form apps

iv. Use the search feature to look for desired template

v. In the configure window, enter the name of your project

vi. Click Next to create the project

b. Same as above

c. VB allows templates as starting point to create programs. Windows Forms App is one such example.

d. A constant is defined name that takes the form of a number or string and does not change throughout the program execution. In contrast, a variable is a placeholder for data that can be changed.

e. An IDE provide GUI that makes writing programs and debugging them robust and easier.

f. Ask student to use their screen recordings for this.

g. The variables allow a way to store data. A variable can store data of any data type supported by the programming language. These can be used throughout the program when needed.

Application Based Questions

1. Students can seek help from the following tutorial: https://www.youtube.com/watch?v=oAGnkJuuxF8&ab_channel=StudySpan
2. The message box program is given below:

```
Private Sub btnMessage_Click(ByVal sender As System.Object, _
ByVal e As System.EventArgs) _
Handles btnMessage.Click
MsgBox("Welcome to Microsoft Visual Basic")
End Sub
```

In the Lab

Ask students to see reference videos for this project and create their own drawing application by following the tutorials.

10 Digital Citizenship

Lesson plan

Recommended number of periods is two. The teachers are advised to breakdown the lesson plan as per the class needs and availability of the resources.

Resources: Textbook, teaching guide, projector

Pre-requisite: Internet search techniques, basic concept of digital citizenship and online safety

Introduction:

Begin the lesson by showing students an introductory video on Digital Life 101 (https://www.commonsense.org/education/videos/digital-life-101). Start a discussion with students about their understanding of digital life to activate previous knowledge. You may use the following questions to steer the discussion:

1. What do you understand by digital life?
2. What are the advantages of being a digital citizen and using digital media?
3. Is there a need to create a balance between online activities and offline activities? If so, why?

Explanation:

Explain the difference between the internet and intranet to the students, and elaborate the different types of websites, providing relevant examples given on the pg 130 in the textbook. For example, Wikipedia is an example of static website, ARY News is an interactive website as content keeps updating; and Daraz is an e-commerce website; You may also ask students to explore and share more examples. Teachers are advised to split the chapter into two sessions. Since many concepts are already familiar to students, you can utilize the class time to explain the new concepts in session 1 and ask students to study and present the suggested topics in session 2. You can divide students into groups and assign each a topic.

Suggested topics that need guidance:

1. Copyright, plagiarism, piracy – pg 132
2. Common uses of internet in businesses – pg 134
3. Security and privacy – pg 137-138
4. Digital media bias and messaging – pg 141

Topics that can be assigned as presentation topics to students:

1. Common uses of internet in social networking pg 134

2. Common uses of internet in entertainment pg 135
3. Uses of internet in information gathering pg 136
4. Netiquette pg 139
5. Pros and cons of social media pg 140-141
6. Social networking pg 142
7. Cloud computing and online sharing pg 144 and 145

Digital content:

Assessments: There is a specialised assessment section of objective based questions on the entire chapter. It can be assigned to students in part after completing specific topics in class or as a whole at the end of the chapter. It can be used for reinforcement of concepts as home task or as marked assessment.

Conclusion:

Wrap up the lesson by providing a recap of the concepts discussed in the class.

Assessment:

As part of formative assessment, discuss the objective type questions given in the Exercise. Alternatively, you can assign students any of the games from the game kit: https://beinternetawesome.withgoogle.com/en_us/interland/landing/reality-river

The different games available in the Kit are:

1. Reality River
2. Mindful Mountain
3. Tower of treasure
4. Kind Kingdom

Assign one game for the purpose of formative assessment. Ask students to explore the other games at home or in their spare time after class in lab.

Classwork:

- Objective type questions

Homework:

1. Descriptive question – pg 127
2. In the lab – pg 11
3. Application based questions – pg 128

Answer to Exercise

Objective Type Questions

1. Choose the correct answer

a) 3	b) sending an email to your teachers	c) report to group admin	d) thinking out loud	e) cyber bully	f) blog post	g) all of the above
h) plagiarize content	i) use strong password for all accounts.	j) report it to a trusted adult	k) staying safe online			

Descriptive Type Questions

Answer the following questions:

a. The internet has turned the world into a global village. It has made communication a lot faster and more efficient. Freelancing is a classic example of how the internet has made life easy. Internet has given rise to many platforms that help people earn from their homes benefitting and strengthen their financial situation.

b. Malware stands for malicious software. It is activated when a user clicks any suspicious link or attachment, which leads to installing malcontent on an individual's PC. To keep computer safe from malware:

i. Install anti-virus software

ii. Install firewall

iii. Regularly update software

iv. Backup data regularly

c. Following are the ways in which internet can be used for entertainment:

i. Ebooks

ii. Online streaming (audio and video)

iii. Online gaming

iv. Podcasts

v. Social media websites

d. Search engines provide a way to gather information online. Furthermore, news websites also provide information. All major news channels have websites that allow users to access information online.

e. Online sharing services provide a quick and convenient way to share files and media with others online. It avoids delays and can be accessed from anywhere.

f. Google drive and Dropbox are two examples of cloud computing services.

g. Social networking refers to virtual communities where people can connect and share memories with friends and family online. Facebook and WhatsApp are two examples of social networking sites.

h. If he is creating or an accessing account from a public network, there are chances that his sensitive information such as phone number may be at stake. The data can be accessed by hackers and used against him.

i. The possible dangers of internet and their solutions are:

i. Cyberbullying: sending hateful messages to someone. If at any point, you encounter this it is important to report to group admin or a trusted adult or parent.

ii. Damaged reputations: camera phones, digital cameras and webcams are everywhere these days, and kids can be victims of their own inexperience with new technology. Many post pictures, videos or notes online that they later regret. To stay safe it's important to explain to kids to delete their photos online and not to share their pictures publicly on social media.

j. Question 10 and 11 are essentially the same and can have similar responses.

1. Use please and thank you in your conversation

2. Introduce yourself when starting conversation with someone for the first time

3. Use your words wisely and do not use foul language

4. Do not mock people's opinions

5. Do not spread false news. Verify from authentic sources before spreading any news

k) Advantages of social media are:

i. Information retrieval is easy

ii. Online fundraising and charity is easier and people from around the world can pool money

iii. Online shopping has made shopping experience robust and more enjoyable

Disadvantages of social media are:

i. Hacking

ii. Cyberbullying

iii. Piracy

iv. Scams

Application Based Questions

1. Ask students to search for videos on online safety on internet and related content to create a poster.
2. She can share files using cloud based file sharing services such as Dropbox
3. She can use Google Photos to store, share and manage photos
4. She can wish her friend on Instagram
5. He can use WhatsApp for audio and video calling.

In the Lab

1. Ask students to use internet search techniques to gather data and prepare the reports.
2. You can use Google Photos to manage and store photos.
3. Online file sharing: One Driver and We Transfer, Internet telephony: WhatsApp and FaceTime
4. Online gaming: chess.com, Roblox; photo sharing: Google photos, Instagram
5. Suggested title: Let's explore Nature. However, teachers must encourage students to come up with other creative titles

11 Entrepreneurial Design Thinking

Lesson plan

Depending on the number of periods, the ideas from this lesson plan can be used to make multiple lessons. It is strongly suggested that teachers spare some time at the end of the lesson for hands-on practice.

Resources: Textbook, teaching guide, projector

Pre-requisite: Basic concept of entrepreneurship

Introduction:

Start the lesson by asking students if they know of any person/friend/relative who has started their business? What type of product or services they are providing? Students must have come across people having their own business such as making customized cakes, cards, etc. Spend 10-12 minutes and let students share their knowledge and experience of interacting with such business owners. You can make the discussion more interesting for students by asking them if they have any business idea they would like to pursue.

Explanation:

Next, explain to students that setting up a new business requires a lot of work and brainstorming. Help them understand this concept more by showing the video Anatomy of an Entrepreneur. At the end of the video, ask students what qualities they think are needed to be an entrepreneur.

Next, elaborate and help students understand the concept of design thinking. Explain to students that design thinking is not only applied when creating works of art, but is also applied and practiced for solving any problem. Connect this concept with their understanding of computational thinking; design thinking is used to create human-centered solutions, while computational thinking involves the process of thinking like a computer.

Explain the definition and process of design thinking, and its benefits to entrepreneurs given on pgs 146 and 147. Extend this explanation by showing the Design Thinking Process video to students. Define and explain Innovation to students given in textbook on pgs 147-148. Let students understand this concept in greater detail by showing them the video: What is Innovation.

Ask students to read through the topic, Explain a project with design thinking and SDGs, on pgs 148 and 149, respectively and share their understanding.

Digital content:

Videos may be assigned before studying the relevant topic or after the topic is complete as a reinforcement.

List of videos:

1. Design thinking for entrepreneurs

Assessments: There is a specialised assessment section of objective questions based on the entire chapter. It can be assigned to students in part after completing specific topics in class or as a whole at the end of the chapter. It can be used for reinforcement of concepts as home task or as marked assessment.

Conclusion:

Wrap up the lesson by providing a recap of the concepts discussed in the class.

Assessment:

At the end of the lesson, discuss objective type questions given in the exercise section as part of formative assessment.

Classwork:

- Objective type questions – pg 154 and 155

Homework:

1. Descriptive question – pg 151
2. In the lab – pg 151
3. Group project – 151

Objective Type Questions

1. Choose the correct answer

a) to come up with creative solution to problems	b) analyze data	c) ii and iii	d) by understanding and considering the needs and emotions of the user	e) discourage user centered approaches
f) to create jobs	g) risk taking	h) developing a business plan	i) all of the above	j) flexibility and independence

Descriptive Type Questions

Answer the following questions:

a. Design thinking helps in designing effective, efficient and human-centered solutions to the problems. The design thinking process consist of following steps:

i. Empathize: this requires understanding the user needs to the core and by putting oneself in user's shoes and then looking for possible solutions to address the need.

ii. Define: during this stage, the problem and the data gathered from the empathize phase are analyzed and are defined.

iii. Ideate: once the problem and the relevant data is at hand, the next stage is idea generation, during which the team brainstorms and ideas are brought to table to solve the problem.

iv. Prototype: this is the experimental phase where the team develops a blueprint of the problem. This prototype can take any form, for example an app, and is tested with users to gather feedback. The advantage of prototypes is that it provides a way to test the product before it proceeds with final completion.

v. Test: the prototypes are tested with end-users for any errors or modifications.

The entrepreneurs can use design thinking for enhanced creativity. It also helps to generate a pool of ideas and helps the team to collaborate and select the most viable solution to the problem. It also helps the team to keep the customers at the center and design for them.

b. There are various ways to gather information from the customers:

i. Researching existing data available for the problem identified.

ii. Interviews

iii. Surveys

iv. Observation

c. Prototypes provide an efficient and cost-effective way to gather user feedback early on in the process before proceeding with developing the final product.

d. Following are a few important ethical considerations that one must consider when designing solutions:

i. Making sure the design does not leave out any person or community.

ii. Focusing keenly on the goals of the target audience.

iii. Embrace inclusion and diversity.

iv. Letting the user make informed decisions and choices when using product or service.

e. Collaboration helps widen the idea pool. There might be needs of team collaboration or collaborating with the end user when design thinking. These collaborations can either be done in a face-face setting such as in an office or remotely. There are a lot of collaborative tools online that help people from different corners of the world connect and work. For instance, if a team is thinking to create a mobile app, they might use Figma, a tool that allows to work online and create designs collaboratively.

In the Lab

Ask students to search for a problem online and come up with a solution in form of flow chart.

Group Project

1. Ask students to use internet to research for digital marketing techniques. They can use the business plan templates, that are available online, to write their own sample of business plan.
2. Share the weblink https://www.ideou.com/blogs/inspiration/11-products-made-using-design-thinking with students to study different solutions achieved through design thinking.
3. Encourage students to research for the key problems and create a poster addressing any one of them.

Introduction to Emerging Technologies

Worksheet 1

Choose the correct answer

1. Emerging technology refers to:

a. New technology

b. Continuous development of existing technologies

c. Progression of technology

d. All of them

2. _____ is a measurement of physical characteristics such as fingerprints, iris, and facial recognition

a. Computer Assisted Technologies

b. Open source software

c. Biometrics

d. Robotics

3. Robots interact with the physical world through

a. Mechanical arms

b. Actuators

c. Sensors

d. Both b and c

4. Mars Rover is an example of:

a. Humanoid robot

b. Autonomous robots

c. Pre-programmed robots

d. All of them

5. The 3D-printed object is created using which of the following processes?

   a. Physical solid objects from a file

   b. Sliced cross-sectional process

   c. Additive process

   d. None of these

6. Virtual reality is operated through

   a. Sight

   b. Sound

   c. Speech

   d. Both a and b

7. _____ is a 3D image generated using photogenic projection

   a. Virtual reality

   b. Augmented reality

   c. 3D hologram

   d. 3D printing

Fill in the blanks:

1. _____ is code designed to be used, modified, and distributed by public.
2. Robotics is a merger of _____, technology, and _____.
3. Prosthetic arms is an example of _____kind of robots.
4. The two major pieces of equipment required for VR are _____ and _____.
5. Mouse is connected to the system's motherboard using _____.

Short questions and answers:

1. Give three examples of internal ports.
2. Provide any two examples of Augmented reality.
3. How do self-driving cars work?
4. The table on the next page lists various features of different types of robots. Observe these and identify the correct type.

Features	Type of Robot
Operate in a controlled environment Perform monotonous tasks An example is mechanical arm	
Resemble real people with expressions Perform running, jumping, and carrying objects Example: Sophia: Russian-speaking robot	
Work in extreme geographical conditions Semi-autonomous Example: human-controlled air drones	
Enhance human capabilities or replace the capabilities that humans might have lost Examples include: prosthetic arms	

5. Provide two differences for each of the following:

a. Internal and external port

b. Augmented reality and virtual reality.

Higher-order questions:

1. How do you think virtual reality can enhance the learning process?

2. Humanoid robots mimic human behaviour. Could there be any potential risks of these kinds of robots to mankind? Do you think humans will ever be replaced by robots?

MS Word

Worksheet 2

Choose the correct answer

1. Which of the following is NOT an example of word processing software?

a. MS Word

b. Open Office

c. MS Paint

d. Gnome office

2. Commonly used options in MS Word can be accessed from:

a. Ribbon tabs

b. Quick access toolbar

c. Help ribbon

d. Both a and c

3. There are _____ points in one inch

a. 72

b. 27

c. 15

d. None of these

4. Page size can be selected from which of the following options in MS Word?

a. Ribbon tab

b. Layout tab

c. Print settings

d. View button

5. Ctrl + E is the shortcut key for

a. Left aligning text

b. Right aligning text

c. Justify text

d. None of the above

6. To view the document in read mode, you can access it from:

a. View button

b. Ribbon tab

c. Print settings

d. Layout tab

7. Text area is also called:

a. Canvas

b. Editor

c. Document pane

d. Both b and c

8. To see how the document will look after printing, the zoom level should be set at:

a. 150%

b. 50%

c. 200%

d. 100%

9. _____ is a default font in MS Word

a. Calibri

b. Times New Roman

c. Arial

d. Comic Sans MS

10._____ are used for binding space for books

a. Margins

b. Gutters

c. Alignment

d. Both a and b

11. The smallest unit of the table is called a:

a. Cell

b. Row

c. Column

d. All of them

Fill in the blanks:

1. _____ are the set of skills that allow one to interact with the digital world.

2. Formatting, editing, and printing of text is supported by _____.

3. The shortcut key for the help button is _____.

4. User can scroll the content up and down through _____.

5. Ctrl+U is the shortcut key for _____.

6. Dialog box launchers are also called _____.

7. Postcards or drawings usually have _____ page orientation.

8. _____ feature in MS Word allows applying colour corrections, sizing, or removing the background of images.

Short questions and answers:

1. Write the function of the following shortcut keys:

a. Ctrl+B _____

b. Ctrl+L _____

c. Ctrl+I _____

d. F1 _____

e. Ctrl+S _____

f. Ctrl+E _____

g. Ctrl+ R _____

h. Ctrl+J _____

2. Look at the different font styles below. Classify them as serif or sans serif and fill in the table below:

Serif fonts	Sans Serif

3. Look at the different text alignments below. Identify them.

Glaciers are melting, sea levels are rising, cloud forests are dying, and wildlife is scrambling to keep pace. It has become clear that humans have caused most of the past century's warming by releasing heat-trapping gases as we power our modern lives. Called greenhouse gases, their levels are higher now than at any time in the last 800,000 years.

Alignment type: _____

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Glaciers are melting, sea levels are rising, cloud forests are dying, and wildlife is scrambling to keep pace. It has become clear that humans have caused most of the past century's warming by releasing heat-trapping gases as we power our modern lives. Called greenhouse gases, their levels are higher now than at any time in the last 800,000 years.

Alignment type: _____

4. Define headers and footer in MS Word?

   _____.

   _____.

5. Observe the tasks below. Which MS Word features do you think you would use to format your document correctly?

   a. Used in headings, emphasize important terms in the document so that they stand out:

   b. To represent information as an itemized list or in an order.

      _____.

   c. Information repeated on every page such as author name, page number, institute name
      _____.

   d. Improve writing and replacing repeated words with synonyms

      _____.

6. What are the three ways in which a table can be inserted in MS Word?

Higher-order questions

1. Throughout the chapter, you have learned and practiced various features of MS Word. These features help you professionally format your documents. Given this, reflect on why you think it is important to format your documents. What are the advantages of doing so?
2. Why do you think images play an important role in word processing software?
3. You have studied both Serif and Sans serif fonts. In your opinion, which font style would you prefer most? Why?

MS PowerPoint

Worksheet 3

Choose the correct answer

1. Which of the following is an example of multimedia software?

a. Open Office

b. MS Word

c. Prezi

d. All of them

2. Which animation type introduces a slide object within the slide:

a. Exit

b. Emphasis

c. Motion path

d. Entrance

3. List, process, relationship, hierarchy is an example of

a. Smart art graphic

b. Tables

c. Graphs and charts

d. All of them

4. Which of the following allows you to view the presentation and run the show in full-screen mode?

a. Read mode

b. Zoom

c. Slide show

d. Slide sorter

5. Bounce animation is a type of

a. Entrance animation

b. Motion path

c. Exit

d. Both a and b

6. Which of the following is the most common type of layout in PowerPoint?

   a. Picture with Caption

   b. Two Content

   c. Section Header

   d. Title and Content

Fill in the blanks:

1. _____ allows to view all slides in one pane and the order of the slides can be changed through drag and drop.
2. Pre-installed designs in MS PowerPoint are called _____.
3. Shortcut key for displaying slide show is _____.
4. _____ makes the presentation more attractive and interactive.
5. Animations are used to animate slide objects off a slide _____.
6. To exit the slide show press _____.

Short questions and answers:

1. Look at the icons below and identify their function:

_____

_____

_____

_____

_____

2. Differentiate between Slide Show and Reading View.
3. What do you understand by Normal View in PowerPoint?
4. Differentiate between Entrance, Exit, and Emphasis animation.

Higher-order questions

1. SmartArt graphic allows to represent data of various sorts visually. The data can be represented as Lists, Processes, Cycles, and Hierarchy. Look at the situations below and identify which SmartArt graphic would be most suitable.

Tasks	SmartArt Graphic
Representing steps of the water cycle process	
Representing your to-do-list	
Representing different types of trees and their sub-types	
Representing steps of making a sandwich	

2. Being a digitally literate citizen, you are familiar with word processing softwares such as MS Word and MS PowerPoint. Both software are designed to serve specific purposes. How do you think both differ from one another? Justify your response with an example.

The Internet as a Post Office

Worksheet 4

Choose the correct answer

1. ISP is an acronym for

a. Internet search provider

b. Internet service provider

c. Internet solution provider

d. Both b and c

2. A collection of web pages is referred to as:

a. Website

b. Web browser

c. Search links

d. All of them

3. The page that first appears on the website is called:

a. Service page

b. Webpage

c. Homepage

d. Both b and c

4. Another name for DNS is

a. HTML

b. ISP

c. Homepage

d. Letter Addressing

5. .com represents:

a. Commercial organization

b. Customer organization

c. Canada

d. Company

6. Which of the following internet protocol works by downloading emails to the client's local device and deleting them from the server:

a. IMAP

b. SMTP

c. POP

d. FTP

7. In Gmail, the inbox tab is organized in which of the following categories?

a. Primary, Spam, Drafts

b. Spam, Trash, Primary, Forums

c. Contacts, Primary and Sent, Contacts

d. Primary, Social, Promotion, Updates, Forums

8. Hotmail.com and live.com have been replaced with which of the following web services?

a. Outlook.com

b. Gmail.com

c. 365.com

d. Both a and c

9. Which of the following does not represent an appropriate tone and language of the email?

a. Use words carefully

b. Choose an appropriate greeting and closing

c. Be courteous and respectful

d. Write emails when you are in a hurry

10. Signing in with a single set of login credentials is called:

a. One-click login

b. Single sign-on

c. 2-factor authentication

d. Both b and c

11. All the deleted messages are directed to:

a. Spam

b. Trash

c. Drafts

d. Both a and b

Fill in the blanks:

1. Modulator-demodulator is abbreviated as _____

2. 192.12.168.168 is an example of _____.

3. Personal website similar to the diary is called _____.

4. Two examples of social networking sites are _____ and _____.

5. _____ is a collection of publicly accessible webpages

6. SMTP stands for _____

7. Computers running in multi-user environments have a unique set of _____ and _____ for logging in.

8. The text that appears at the bottom of every email is called _____.

Short questions and answers:

1. Consider the email address: ali_farooq@gmail.com, identify the username, and the internet address, and also mention what does .com represent?

2. Define email

3. Provide 5 examples of any website

4. Differentiate between webpage, website, and web browser.

5. Differentiate between Trash, Spam, Sent, and Inbox folders in Gmail.

6. In what situation can BCC be used?

7. Complete the following table:

.edu	
	Germany
.net	
	Organization
us	

Higher-order questions:

1. Study the following scenarios carefully and answer the following questions:

Scenario A: You receive the following email from the Help Desk:

Dear Email User,

Beginning next week, we will be deleting all inactive email accounts to create space for more users. You are required to send the following information to continue using your email account. If we do not receive this information from you by the end of the week, your email account will be closed.

*Name (first and last):

*Email Login:

*Password:

*Date of birth:

*Alternate email:

Please contact the Webmail Team with any questions. Thank you for your immediate attention.

Question: What should you do?

Scenario B: A case was reported some time ago where someone used their Gmail account in a campus computer lab. The person made sure that their Gmail account was no longer open in the browser window before leaving the lab. Someone else came in behind them and used the same browser to re-access their account. They started sending unauthorized emails from it and caused all sorts of mayhem.

Question: What do you think might be going on here?

Scenario C: You receive an email from your bank telling you there is a problem with your account. The email provides instructions and a link for you to log in and fix the problem.

What should you do?

Algorithmic Thinking and Problem-Solving

Worksheet 5

Question: Choose the correct answer

1. Which trio is defined as constructs of an algorithm?

a. Selection, Repetition Abstraction

b. Decompose, pattern recognition coding

c. Coding, maintenance iteration

d. None of the above

2. What is not a definition of a function?

a. A program that can be reused multiple times

b. A program that is used once

c. A program that enables programmers to decompose a problem

d. None of the above

3. Which defines a flowchart?

a. A pictorial representation of a problem

b. A written solution

c. A program in HLL

d. A built-in function

4. What is the definition of a conditional statement?

a. A statement used to help in decision-making

b. A statement used to highlight a statement in code

c. A statement used to start a program

d. All of the above

5. What is the definition of a syntax error?

a. It's described as a grammatical or punctuation error

b. It's an error produced when the program does not run

c. It's an error that occurs when the program gives logic errors

d. None of the above

6. What is a finite loop?

a. It repeats a specific or fixed number of times

b. It's never-ending

c. It's an example of a conditional statement

d. None of the above.

Fill in the blanks:

1. _____ involves breaking a problem into smaller steps.

2. _____is a piece of code that you can use over and over again.

3. Pattern recognition involves finding common solutions to common _____.

4. A flowchart uses _____ to illustrate an algorithm.

5. Sequence, selection, and repetition are collectively known as _____ of an algorithm.

6. _____ involves removing useless data.

Short Questions and answers:

1. Write the main components of computational thinking.

2. Outline the basic constructs of an algorithm.

3. Define Logic Errors.

4. Define conditional statements

5. Write a number in the correct order in front of each step showing the correct sequence for a program checking for odd numbers.

Steps	Order
End	
Calculate number mod 2	
Begin	
Ask for the number	
Check if the calculation returns '1' output Odd number	
If the calculation does not return 1 output	
Not odd	

Higher-order questions:

1. A programmer wants to input the speeds of different sports cars passing a speed camera and convert those speeds from m/hr to m/sec. Draw a suitable flowchart to illustrate the situation.

2. An auction manager wants a program that compares bids against each other and then stores the highest bid out of the two. The program iterates 40 times repeating the process and then outputs the highest bid. Draw a suitable flowchart.

Binary Computing

Worksheet 6

Choose the correct answer

1. The word data is derived from?

a. Daty

b. Datum

c. Datsa

d. None of the above

2. Binary numbers are represented as:

a. 1s and 2s

b. 0s and 1s

c. 1s and 3

d. All of them

3. What is encoding?

a. The conversion of data to letters

b. The conversion of analog signals to digital signals

c. The conversion of analog to sound

d. None of the above

4. What is a number system?

a. A way to represent numbers

b. A character set

c. A collection of 1s and 0s

d. All of the above

5. What is the binary number system based on?

a. 16

b. 8

c. 10

d. 2

6. What is the equivalent of 1+1+1?

a. Zero and carry of 1

b. 1 and carry of 1

c. Zero only

d. None of the above

7. What is a byte?

a. A group of 8 bits

b. A single 1 and 0

c. A group of 16 bits

d. A group of 4 bits

Fill in the blanks:

1. _____ is a base 2 number system understood by computers.

2. Current flowing in the circuit is represented by binary _____.

3. Digital images are made of _____.

4. _____code represents each character that can then be converted into binary for a computer to understand.

5. _____ is often captured by a microphone.

6. A _____ will sample a sound wave at regular intervals.

7. The 1s complement of 0001111001 is _____.

Short Answers:

1. What is the purpose of an analog-to-digital converter?

2. What is Unicode?

3. How many bits can be used per pixel?

4. Evaluate the following:

Question	Sum	Carry (if any)
1+0		
1+1		

5. Add the following:

I. 1000111+00000111 II. 011100110+00001111 III. 1100+0011

6. Define bit

Higher-order questions:

1. A photographer wants to store a picture in black and white on a 5x3 grid. Draw a suitable grid to show this.

2. A computer algorithm converts files to MB if they are in KB and vice versa. Convert the following files according to the suitable situation and show the working.

I. 90MB II. 80MB III. 70KB

Assume 1 MB=1000 KB

Worksheet 8

Choose the correct answer

1. What is a program?

a. A set or collection of instructions.

b. A set of files stored on the main memory

c. Both a and b

d. None of the above

2. What is low-level language?

a. Basic Human language

b. Basic machine codes and instructions

c. Basic integers

d. None of the above

3. What is the purpose of IDE?

a. It's a Windows-based program that allows programmers to store programs

b. A window-based program that assists in coding and its management

c. A program that manages files

d. None of the above

4. What is not a part of C language?

a. Library

b. Abstraction

c. Loader

d. Link

5. What is a translator for assembly language?

a. Debugger

b. Compiler

c. Interpreter

d. Assembler

6. What does Assembly language use?

a. Context-sensitive prompts

b. Mnemonics

c. Hashtags

d. None of the above

Fill in the Blanks:

1. _____ are names given to data entities and data structures.

2. _____ allows programmers to build forms by a drag-and-drop interface.

3. _____helps in identifying errors.

4. An_____ assists in translating a code in assembly language to machine code.

5. The _____ helps in organizing all functions and files as a single program.

6. The job of a loader is to get the program into the _____.

Short questions and answers:

1. What is an identifier?

2. Define IDE.

3. State the task of a Debugger.

4. State the full form of the IDE.

5. State the purpose of a compiler.

6. Differentiate between low-level and high-level languages.

Higher-order questions:

1. Write a program in C that inputs the length and width of a 2D shape and outputs the area and perimeter. Assume only square, triangle, and rectangle shapes are used.

2. Write a program in C that calculates the total of temperature readings and the average. Then output if the weather is sunny, cloudy, or rainy. Assume that if the average is less than 20 and greater than 15, it is cloudy; if above 20, it is sunny; and if less than 15, it is rainy.

Visual Basic

Worksheet 9

Choose the correct answer

1. Visual basic is considered to be:

a. Event driven

b. Object-oriented

c. Web-based

d. Both a and b

2. _____ occurs when the execution of the debugging program is suspended.

a. Design mode

b. Run mode

c. Halt

d. Break mode

3. Event in programming is defined as:

a. An action that triggers the program to do something

b. A set of instructions followed in sequence

c. A block of code that repeats for a certain number of times

d. An infinite loop

4. The name of the project is entered in which of the following windows

a. Create a new project

b. Windows form App

c. Configure

d. Both a and c

5. Variables are placeholders for various

   a. Events

   b. Loops

   c. Data types

   d. Numbers

Fill in the blanks:

1. The process of initializing a variable is called _____.
2. The toolbox in VB contains elements called _____.
3. The IDE is said to operate in _____ mode when the code is in a non-running state.
4. VBA and _____ are the two most used frameworks.
5. GUI stands for _____.

Short questions and answers:

1. What is the keyword Dim used for?
2. What would the following code snippet do?

   Dim score As Integer=0

3. What will be the output of the following code snippet?

   MsgBox("Number 1 and 2 are" + "num1"+"num2")

   How would you alter this code to get the expected result, i.e. the sum of two numbers?

4. Define a constant?
5. Write the syntax to declare the datatype in VB?

Digital Citizenship

Worksheet 10

Choose the correct answer

1. The responsible use of technology and other digital devices is called:

a. Internet

b. Digital literacy

c. Digital citizenship

d. Both b and c

2. Intranet is called:

a. A private network

b. A public network

c. A system that has many users

d. Both b and c

3. Weather forecast is an example of

a. Static website

b. E-commerce website

c. Retail website

d. None of them

4. A website is similar to a software

a. True

b. False

5. Which of the following does not represent an ethical code of conduct when dealing with digital interactions?

a. Do not download from torrents

b. When communicating in public forums, keep the conversation confined to relevant topics

c. Report to a stranger if you feel you are not safe online

d. Do not share others' work without permission

6. YouTube is an example of:

a. Online gaming service

b. Online video streaming services

c. Social networking site

d. Podcast

7. Which of the following is NOT an example of a social networking site

a. WhatsApp

b. Facebook

c. Snapchat

d. Netflix

8. Protection against unlawful or unauthorized access is known as:

a. Data theft

b. Digital trail

c. Data science

d. Data Confidentiality

9. DoS refers to:

a. Denial of services

b. Domain server

c. Degree of Safety

d. Both b and c

Fill in the blanks:

1. The practice of trying to trick people into giving away their personal information is called: _____.

2. Malware stands for _____.

3. The right of an individual to have control over how their information is being used is called _____.

4. Bing is an example of _____.

5. The digital version of a printed book is known as _____.

6. Presenting someone else's work as your own is known as: _____.

Short Answers:

1. What is cloud hosting?

2. Provide examples of the apps/websites that use the internet and are used for entertainment purposes.

3. Provide two examples each of a static website and an e-commerce website.

4. Is Instagram an e-commerce app/website? Why or why not?

5. Mention two differences between the internet and intranet.

6. Define digital ethics?

7. Provide two examples of video conferencing tools. Is WhatsApp a video conferencing tool or social networking site? Justify your answer.

8. Is YouTube a social networking site? Why or why not?

Higher-order questions:

Study the scenarios below and respond accordingly.

1. Two different offices on campus are working to fix an error in an employee's bank account resulting from a direct deposit mistake. Office #1 emails the correct account and deposit information to office #2, which promptly fixes the problem. The employee confirms with the bank that everything has, indeed, been straightened out.

   Question: What's wrong here?

2. A staff member in I.T.S. subscribes to several free I.T. magazines. When activating her subscriptions, one magazine asked for her month of birth, a second asked for her year of birth, and a third asked for her mother's maiden name.

   Question: What do you think might be going on here?

3. You are receiving an electronic Hallmark greeting card (e-card) in your email. You need to click on the attachment to see the card.

   Question: What should you do?

Worksheet 11

Choose the correct answer

1. What is design thinking?

a. Compiling a code

b. Calculating costs

c. A skill that revolves around problem-solving

d. None of the above

2. What is not a part of design thinking?

a. Define

b. Load

c. Test

d. Prototype

3. What is innovation?

a. Developing something new and better with good intentions

b. Discovering something new

c. Analyzing a problem

d. All of the above

4. What is not done in prototyping?

a. Selecting best ideas and making prototypes

b. Making semi-working modules or models of the actual project

c. Storing information

d. None of the above

5. What happens in the ideation phase?

a. Team comes up with solutions to cut costs

b. Team comes up with ideas to solve the problem

c. Team solves the problem

d. None of the above

6. What is defined as empathy?

a. Team understands and analyses the audience's needs.

b. Solving problems via pre-written functions

c. Loading programs

d. All of the above

Fill in the blanks:

1. _____ involves defining the problem to be solved.

2. Design thinking promotes _____ and _____ which aids in building effective teams.

3. _____ mindset refers to an attitude of an entrepreneur.

4. An_____ could learn from customer experiences.

5. _____ can help create new business ideas and products.

Short questions and answers:

1. What is design thinking?

2. What is prototyping?

3. What is innovation?

4. What are the pros of design thinking?

5. What is ideation?

6. What is testing?

Higher-order questions:

1. A mobile company wishes to launch a new product. Its previous model was not a success and thus it aims to work on a new one. Explain how design thinking helps in this process, whilst highlighting each step or aspect of design thinking.

2. A group of entrepreneurs decides to improve its existing project on clean free energy for its city. Explain briefly how innovation and design thinking can be used together to do so.