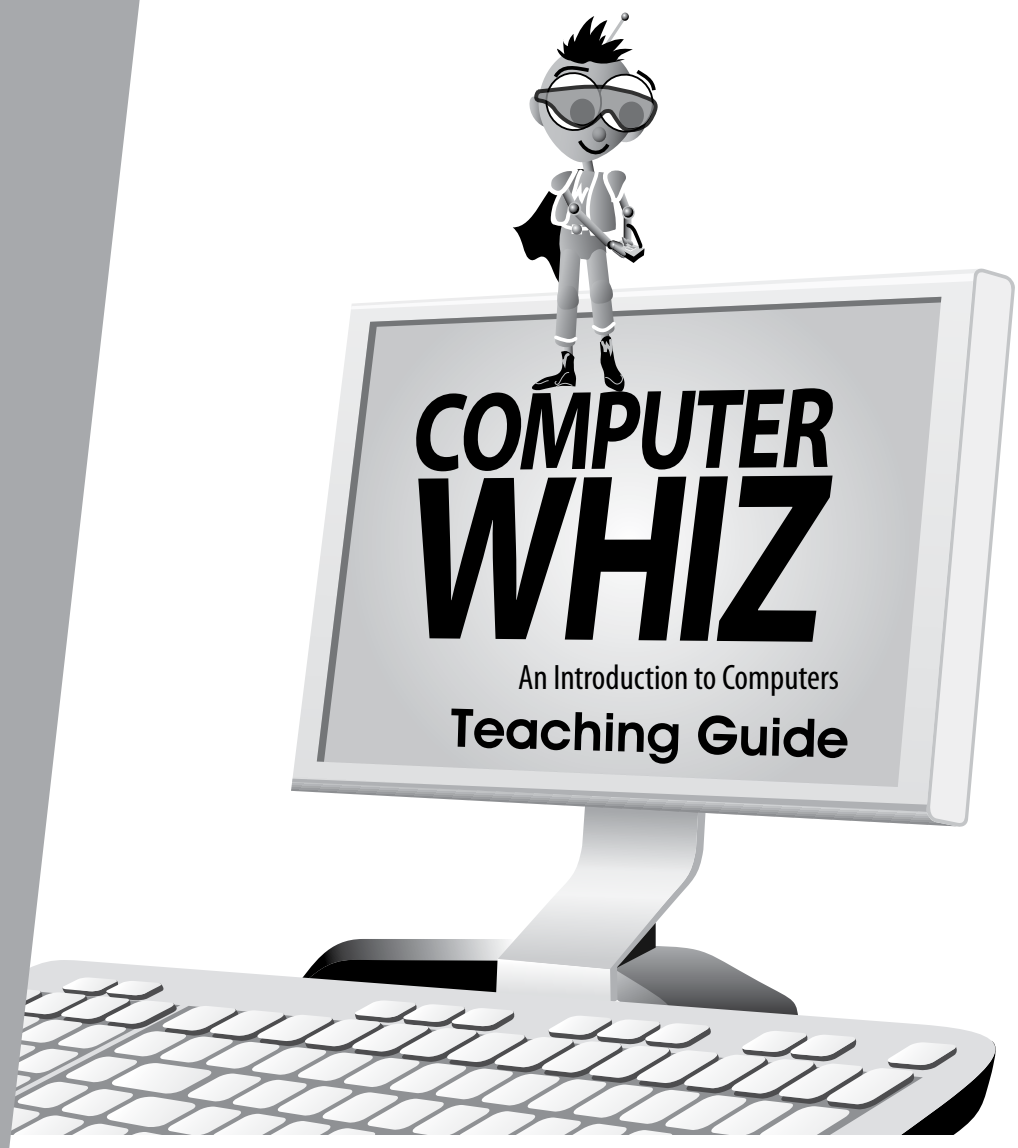
5 Third Edition



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Introduction

Computers have become an integral part of our everyday lives. We use computers everywhere. Hence, a clear understanding of basic computer concepts and applications is vital.

The ***Computer Whiz (Third Edition)*** series provides students with detailed basic knowledge of computers at the primary level. The computer is presented to students through Whiz, the mascot, to create interest and visual appeal. Varied activities reinforce their understanding of the different concepts. The new features, fresh layout, and stimulating exercises added to this edition will help develop computer skills and enhance student learning.

Whiz's Files is a list of chapters in the book with teaching objectives and learning outcomes.

Word Whiz consists of activities involving the use of new words introduced in each chapter.

Whiz's Commands includes tips on conduct, etiquette, and safety while using the computer and the Internet.

Whiz Bytes provides interesting facts about computers to students.

Explore with Whiz consists of interesting and challenging exercises/activities that review the concepts that have been learnt in the chapter.

Whiz's Tasks comprise of worksheets provided in the Teaching Guides for classroom practice.

Whiz through Lab encourages the students to do practical work and helps develop their skills on the computer.

Whiz through Projects promotes intellectual and social skills and encourages teamwork.

Whiz's Notes at the end of each chapter offers a summary of the important points.

Whiz's Word File at the end of each book is a glossary. It is a list of computer terms with clear definitions.

Introduction to the Teaching Guides

The Teaching Guides provide helpful tips, lesson plans, and worksheets with engaging activities that support learning. They act as a framework to help you develop your own lesson plans and teaching strategies.

Each chapter has a list of objectives and learning outcomes. You must try to realize these objectives at the end of each lesson. Sample lesson plans have been provided on the basis of which you can develop your own plans.

A good lesson plan consists of a starter activity for 3-5 minutes which introduces the concepts being taught followed by a 20-minute activity that encourages students to interact with each other. Please engage the quieter students too. This may be followed by feedback of the discussion in larger groups on which you can spend about 10 minutes. Reinforcement of the entire lesson, summarizing, and time for assigning

homework should be at the end of each period for about 2-3 minutes. Students should be taken to the computer lab as required. The more practical experience on the computer, the more proficient the students become at using computers.

Guidelines

While students are working at the computer, discuss the importance of maintaining good posture. Students will probably spend a lot of time at the PC, barely moving, and with their eyes fixed on the screen. Extended use of the computer can have serious consequences on a student's health; a student can develop weak eyesight and severe back problems. It is very important to make students aware that they should not use computers for hours on end. It is important for you as well as your students to be aware of what they should do and things they should avoid doing while using the computer.

Dos and Don'ts

Do...

- have your chair at the right height so that your eyes are level with the computer screen
- have your computer screen directly in front of you
- make sure your chair has a good backrest
- keep your shoulders and back relaxed
- make sure that your wrists rest on the desk
- let your feet be flat on the floor
- take regular breaks
- adjust the position of the computer so that there is no glare on the screen
- make sure you have a protection screen on top of the monitor screen.

Don't...

- fix your eyes on the screen continuously
- lift your shoulders while you type or move the mouse
- twist your body to reach out for computer hardware
- use your PC in poor lighting.

Chapter 1 Generations of Computers

Teaching objectives

The objectives of this chapter are to:
- introduce computers from different generations
- discuss how computers have changed through the years.

Learning Outcomes

By the end of this chapter, students should be able to:
- explain how the computers from different generations functioned
- summarize how the present-day computer has evolved.

Suggested number of periods: 2

Period 1

Sample lesson plan for a 40-minute period

Starter activity (5 minutes)
Bring in the different computing devices discussed in this chapter into the classroom and ask students what they think these might be. After hearing their responses, name each device and explain that they will be learning more about these in this and the next lesson.

The vacuum tube (page 2) (5 minutes)
Ask two students to volunteer to act the role of Whiz and the vacuum tube. As they read out the lines spoken by Whiz and the vacuum tube from the textbook, explain the implications of vacuum tube technology for first-generation computers. Explain what ENIAC stands for and what it was used for.

The transistor (page 3) (10 minutes)
Following the same strategy, have two different students act out the parts of Whiz and the transistor. Explain the ways in which the transistor was a more advanced form of technology than the vacuum tube.

Assign the Word Whiz activity to be completed in the classroom.

The integrated circuit (pages 4 and 5) (20 minutes)
Again, select two students to read out the lines spoken by Whiz and the IC chip. Explain the changes that took place in the course of evolution of the IC chip. Describe the type of computers that the IC chip enabled to be developed. Explain what the IC is made of and how it accommodates a large number of circuits and data.

Ask students to answer the questions given on pages 4 and 5 of the textbook.

After the discussion is completed, ask students to draw a table in their exercise books and list the differences between the five generations of computers. (Alternately, you

may choose to photocopy this table and give it to the students to fill out.) The layout could be as follows:

Generations of Computers					
	First Generation	Second Generation	Third Generation	Fourth Generation	Fifth Generation
Year					
Name of device					
Physical characteristics (size, weight, etc.)					
Technology used					
Examples					
Inventor(s)/ Designer(s)/ Developer(s)					
Others					

Period 2

Sample lesson plan for a 40-minute period

Circuit boards and microprocessors (page 6) (15 minutes)
Explain the concepts about circuit boards and microcomputers given on page 6 of the textbook while students act out the parts of Whiz and a microprocessor. Discuss the main differences and benefits of a microcomputer over earlier types of computers.

Explain the constant evolution of computers since the development of the IC chip and microprocessor. Describe the diverse contexts and applications of computers and their increasing levels of sophistication. Explain that as microprocessor technology has improved, computers have become faster, smaller, and more accurate.

Ask students to answer the question given on page 7 of the textbook.

Whiz's Quiz (page 10) (20 minutes)
Help students explore and write down answers to the Whiz's Quiz section in their notebooks. Encourage originality instead of copying text from the chapter.

Homework assignment (5 minutes)
Assign the Explore with Whiz exercises on pages 8 and 9 of the textbook as homework.

Essay writing
Essay topics have been added to this level to encourage students to write and develop proficiency in developing well-rounded views. Assign essays as weekend homework assignment. Students should not be expected to write very long essays at this stage.

Ask students to write an essay on the topic 'How did the modern computer evolve?'

Answers

Match the words to their synonyms. (page 3)

core	central
component	part
large	massive

State three differences between the mainframe and the minicomputer. (page 4)
Mainframes are very powerful computers with large storage capacities, but they are bulky and more expensive than minicomputers.

Hundreds of people can use a mainframe at the same time but a minicomputer serves fewer users at a time.

Banks and large organizations use mainframes. Minicomputers are used in medium-sized companies.

Choose the correct answer to find out more about computer chips. (page 5)
1. microprocessors
2. transistors
3. silicon chips

What do you imagine computers will be able to do in the future? (page 7)
Answers will vary depending on students' own experiences and vision of the future.

Explore with Whiz (pages 8 and 9)
Label the computers and devices. Match the computers to the devices they used.
Left column:
mainframe, minicomputer, microcomputer, laptop computer, smartphone
Right column:
vacuum tubes, transistors, integrated circuit, microprocessor

Fill in the blanks with the names of the correct devices.
A **vacuum tube** is made of a wire and a glass bulb.
An **integrated circuit** carries electronic signals that tell the computer what to do.
A **transistor** uses less electricity than a vacuum tube.
An **integrated circuit** transmits more electricity when heat, light, or voltage is increased.
A **microchip** is made from silicon, a material found in sand and clay.
A **microprocessor** has an integrated circuit with electronic circuits and memory storage.
An **integrated circuit** is used in mainframes and minicomputers.
A **transistor** controls the flow of electricity in a computer.

Whiz's Quiz (page 10)

1. **Why did vacuum tubes need to be replaced?**
   Vacuum tubes needed to be replaced because they consumed a lot of electricity. They often got overheated and broke down.

2. **Which device was used in second-generation computers? Was it a successful venture?**
   Transistors were used in second-generation computers. They were smaller and used less electricity than the vacuum tube, and were cheaper and more reliable. They were successful because large companies bought them as they were faster and more efficient.

3. **Why was the invention of the integrated circuit an important milestone?**
   The invention of the integrated circuit was an important milestone because IC chips were attached to circuit boards inside computers and could read and follow billions of instructions per second.

4. **What is a circuit board?**
   A circuit board is a board on which many IC chips are placed. A circuit board also has a network of circuits connecting the different chips to each other. Larger circuit boards can process more data.

Answers to Additional Activity

1. a, 2. c, 3. b, 4. d, 5. d

Additional Activity

Select the correct answer for each question.

(1) Which of these is the earliest computing device?
- (a) vacuum tube
- (b) transistor
- (c) IC chip
- (d) microprocessor

(2) Which of these devices was used in third-generation computers?
- (a) transistor
- (b) vacuum tube
- (c) IC chip
- (d) modem

(3) Which is the most important chip in a computer?
- (a) microchip
- (b) CPU
- (c) circuit board
- (d) silicon chip

(4) Which generation of computers does the microcomputer belong to?
- (a) first generation
- (b) second generation
- (c) third generation
- (d) fourth generation

(5) Which of these is a feature of fifth-generation computers?
- (a) fast processing
- (b) accuracy
- (c) memory
- (d) voice recognition

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Chapter 2 Peripheral Devices

Teaching objectives

The objectives of this chapter are to:
- introduce peripherals and the different kinds of input and output devices
- explain what each of these devices do.

Learning outcomes

By the end of this chapter, the students should be able to:
- explain the functions of different input and output devices
- identify different input and output devices and explain what they are used for.

Suggested number of periods: 3

Period 1

Sample lesson plan for a 40-minute period

Starter activity (5 minutes)
Ask students to brainstorm the different input and output devices they have learnt about in earlier classes. After the devices have been listed on the board, introduce the term peripheral devices. Explain that the word 'peripheral' means external boundary, or of the surrounding area. Therefore the term, when used in connection with computers, includes all those devices that literally lie around the CPU or are connected to it and help in expanding the CPU's capabilities.

Internal and external peripherals (pages 12 and 13) (10 minutes)
Read out page 12 of the textbook and explain the concepts of internal and external peripherals. Identify the functions of input and output devices by describing some of their common features. Ask students to complete the exercise given on page 13 of the textbook.

Keyboard and mouse (pages 14 and 15) (15 minutes)
Describe the keyboard as a device for manual data entry and explain its different features. This should take little time since students are already familiar with several aspects of a keyboard. Ask students to label the required keys on the diagram given on page 14 of the textbook.

Describe the mouse as a pointing device and explain its features and functions. Describe the different actions that can be performed with a mouse. Explain the usefulness of a mouse in a graphical user interface such as Microsoft Windows. Ask students to name some applications where they need to use only a keyboard, only a mouse, and both the mouse and keyboard.

Ask students to complete the Word Whiz exercise given on page 15 of the textbook.

Joystick and touch screen (page 16) (5 minutes)
Continue with the discussion of pointing devices and discuss the different features of a joystick and a touch screen. Describe the touch screen as both an input device as well as an output device. Ask students where they might have used joysticks and touch screens.

Scanner and barcode reader (page 17) (5 minutes)
Introduce the function of scanning device and differentiate them from other types of input devices. Explain the features and function of a scanner and its relative merits and demerits over other input devices such as a mouse or a keyboard. Explain the function of a barcode and a barcode reader as one type of scanning device. Ask students to recall where they might have seen scanning devices in use.

Period 2

Sample lesson plan for a 40-minute period

Scanning devices (page 18) (10 minutes)
Continuing with the discussion on scanning devices from the previous lesson, introduce the optical character reader and MICR reader. Explain how both the devices work and the different ways in which they are used.

Graphics tablet, webcam, and microphone (page 19) (10 minutes)
Discuss the features and use of the devices given on page 19. Students should appreciate the variety of forms in which these devices enable data to be entered into a computer system, e.g. tactile, visual, audio, etc.

Ask students to complete the exercise given on page 19 of the textbook.

Output devices (pages 20 and 21) (20 minutes)
Discuss the output devices given on page 20 of the textbook. Discuss the monitor and printer with reference to their differences. Explain the difference between soft copy and hard copy. Talk about the different types of monitors and printers and explain the different applications where they are used. Introduce the concept of plotters and describe their use in printing maps and architectural drawings.

Ask students to answer the question given on page 20 and Word Whiz exercise on page 21 of the textbook.

Period 3

Sample lesson plan for a 40-minute period

Explore with Whiz (pages 22 and 23) (10 minutes)
Ask students to complete the Explore with Whiz exercises given on pages 22 and 23 of the textbook.

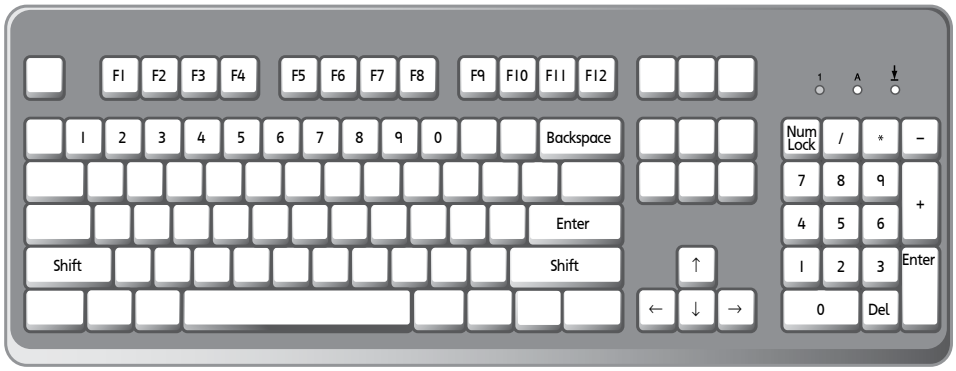
Whiz's Quiz (page 24) (30 minutes)
Help students explore and write down answers to the Whiz's Quiz section in their notebooks. Encourage originality instead of copying text from the chapter.

Answers

Label these devices. State if they are input or output devices. (page 13)
Clockwise from top-left corner:

Monitor (output device), keyboard (input device), scanner (input device), printer (output device), joystick (input device), graphics tablet (output device)

Label the function keys, numeric keys, arrow keys, and special keys on the keyboard below. (page 14)



Word Whiz (page 15)
Match the words with their synonyms.
click: snap
drag: pull
point: aim

What are these devices being used for? (page 19)
Clockwise from top:
drawing a picture, speaking from a booth, talking on the Internet

Which picture has lower resolution? (page 20)
The picture on the right has lower resolution.

Word Whiz (page 21)
Write the antonyms of the following words.

display:	hide
high:	low
expensive:	cheap
different:	same
smallest:	largest
detailed:	sketchy
hard:	soft
slow:	fast

Explore with Whiz (pages 22 and 23)
Underline the correct answer.

1. pixels
2. manual data entry
3. barcode
4. Optical character recognition
5. numeric
6. high
7. input
8. Plotters

Write the name of each device.

Left to right:
graphics tablet, barcode reader, MICR reader, webcam, touch screen

Whiz's Quiz (page 24)

1. **What is a peripheral?**
   A peripheral is a device that is not a part of the main processing system but is used with the computer.

2. **Why is the term 'integrated' used to describe some peripherals?**
   The term 'integrated' is used to describe some peripherals because they are located inside the system unit.

3. **What is a GUI?**
   A GUI or graphical user interface is a point-and-click interface. It involves the use of a pointing device such as a mouse to point to objects on the screen. Objects can be selected by clicking on them.

4. **What are barcodes used for?**
   Barcodes are used for storing data about a product to be sold. They are used on grocery items, books, clothes, and many other items in shops. The code contains information such as the price and identification of the product.

5. **Describe MICR technology in your own words.**

   MICR technology is used to read data printed with magnetic ink. MICR technology is used to read bank cheques which have numbers printed in magnetic ink. A special MICR reader is used to read the numbers printed in magnetic ink. Each digit is read as a separate character. MICR readers help bank employees to identify fake cheques from real ones.

Answers to Additional Activity

1. b, 2. d, 3. a, 4. a, 5. c

Additional Activity

Select the correct answer for each question.

(1) Which of these is an internal peripheral device?
- (a) printer
- (b) CD-ROM drive
- (c) monitor
- (d) barcode reader

(2) Which of these is not a scanning device?
- (a) MICR reader
- (b) OCR reader
- (c) barcode reader
- (d) graphics tablet

(3) Which of these would be found in shops?
- (a) barcode reader
- (b) MICR reader
- (c) webcam
- (d) plotter

(4) An architect wants to print out the plan for a large museum he is designing. Which device should he use?
- (a) plotter
- (b) printer
- (c) scanner
- (d) graphics tablet

(5) Which of these is both an input device and an output device?
- (a) barcode reader
- (b) monitor
- (c) touch screen
- (d) printer

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Chapter 3 More about Programming Languages

Teaching objectives

The objectives of this chapter are to:
- discuss algorithms and flow charts in more detail
- introduce the concepts of command, statement, and syntax.

Learning outcomes

By the end of this chapter, the students should be able to:
- create algorithms and flow charts
- explain and differentiate between the concepts of command, statement, and syntax.

Suggested number of periods: 2

Period 1

Sample lesson plan for a 40-minute period

Starter activity (5 minutes)
Ask students to recall what they have learnt about algorithms and flow charts from Book 4. Discuss the basic concepts of algorithms and flow charts and their role in programming and problem-solving.

Algorithms (page 26) (5 minutes)
As students are familiar with the purpose of writing algorithms, read out the text on page 26 of the textbook to refresh students' concepts. Ask students to identify examples of various instances for which they could write an algorithm.

Flow charts (pages 26 and 27) (10 minutes)
Discuss the different flow chart symbols given on page 26 of the textbook and the example of a flow chart given on page 27. Students may not be aware of the purpose of the Decision symbol, so you may need to explain this in some detail.

Ask students to create a flow chart for the task given on page 27 of the textbook.

Programs and programming (page 28) (10 minutes)
Explain that algorithms and flow charts pave the way for writing full-fledged computer programs. Explain the role of programmers in creating various applications used with computers. Discuss examples of programming languages and, if students are ready to absorb more information, explain the features of some well-known programming languages.

Ask students to complete the Word Whiz exercise given on page 28 of the textbook.

Programming languages (page 29) (10 minutes)
Discuss the various elements used to write programs in a programming language. Introduce the term data and explain the difference between numeric and string data. Write examples on the board and ask students to contribute as well.

Introduce the terms command, statement, and syntax. Explain that a command is an instruction to the computer to perform tasks regardless of the program running. On the other hand, a statement is an instruction embedded in a computer program and relates to the requirements of that particular program alone. Describe syntax as a set of rules for writing commands and statements in a programming language.

Period 2

Sample lesson plan for a 40-minute period

Commands and statements (page 30) (10 minutes)
Ask students to recall what they learned about commands and statements in the previous lesson. Explain the function and syntax of the commands given on page 30 of the textbook. Emphasize the fact that these instructions are performed with or without any program running on the computer and do not relate to a particular program.

Next, introduce the INPUT and PRINT statements. Explain their nature and syntax with the help of the examples given in the textbook. Emphasize that these instructions are always used as part of a program and ask the computer to perform a function relating to that program.

Ask students to complete the Explore with Whiz exercises given on page 31 for homework.

Whiz's Quiz (page 32) (15 minutes)
Help students explore and write down answers to the Whiz's Quiz section in their notebooks. Encourage originality instead of copying text from the chapter.

Lab session (15 minutes)
Ask the students to create a flow chart on a topic of their choice. They can work in pairs. They can use the SmartArt feature in Microsoft Word or use Microsoft Paint to create a flow chart on the computer.

Answers

Word Whiz (page 28)
Match the words to their meanings.
interactive: involving the communication of people or things
symbolic: acting like a sign
binary: consisting of two parts

Explore with Whiz (page 31)
Fill in the blanks.
diamond, Symbolic, BASIC, algorithm, string data, command, PRINT

Match the words to their meanings.

algorithm: an organized set of steps to solve a particular problem

flow chart: a collection of shapes that shows the sequence of instructions in a program

statement: a group of one or more keywords used as part of a program

command: instruction to a computer to perform a specific task

syntax: the set of rules for a language

Whiz's Quiz (page 32)

1. **How do algorithms differ from flow charts?**
   An algorithm is written in the form of step-by-step instructions. Each step is numbered to help the reader follow the algorithm in sequence. A flow chart is a diagram which shows steps through arrows and boxes of different shapes. Each box represents a different type of instruction or step.
2. **Discuss the importance of syntax in programming.**
   Syntax is important because each programming language has a different syntax or set of rules. The syntax tells the programmer how to arrange words and symbols in a command or statement. The computer follows the instructions only if they are written in correct syntax.
3. **What is the difference between numeric data and string data?**
   Numeric data consists of numbers and is used for calculations. String data consists of letters, numbers, and special characters and is used to enter data such as names and addresses.
4. **Which commands are commonly used in programming languages?**
   Commands that are commonly used in programming languages are CLS and SAVE.

Answers to Additional Activity

1. c, 2. b, 3. d, 4. a, 5. d

Additional Activity

Select the correct answer for each question.

(1) What does the rectangle indicate in a flow chart?
- (a) start of a process
- (b) input
- (c) process
- (d) output

(2) Which of these is not true about BASIC?
- (a) It is a programming language.
- (b) It is a binary language.
- (c) It is difficult to learn.
- (d) It has a specific syntax.

(3) Which of these is an example of numeric data?
- (a) Whiz123
- (b) Whiz
- (c) "Whiz"
- (d) 123

(4) Which command or statement is used to enter data into a computer?
- (a) INPUT
- (b) ENTER
- (c) DATA
- (d) FIND

(5) What does BASIC stand for?
- (a) Beginners' All-Purpose Simple Instruction Code
- (b) Beginners' All-Programming Symbolic Instruction Code
- (c) Beginners' All-Purpose Symbolic Instruction Command
- (d) Beginners' All-Purpose Symbolic Instruction Code

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Chapter 4 Introduction to GW-BASIC

Teaching objectives

The objectives of this chapter are to:
- explain the role of GW-BASIC as a programming language
- summarize a few commands and statements of GW-BASIC.

Learning outcomes

By the end of this chapter, the students should be able to:
- discuss the importance of BASIC as a programming language
- explain what the INPUT and PRINT statements do.

Suggested number of periods: 1

Period 1

Sample lesson plan for a 40-minute period
This lesson should be conducted in the computer lab.

For the teacher:
If you teach students how to code, you teach them a skill for life. Computer programming has become a vital part of school curricula at all levels in developing countries. Children must be taught the basics of coding, from understanding simple algorithms to using programming languages in the primary school years.

Introduction to GW-BASIC (page 34) (5 minutes)
Introduce students to GW-BASIC as a version of the BASIC programming language. Demonstrate how to access and open GW-BASIC on the computer and ask the students to do the same. Describe the GW-BASIC interface and revise the concept of commands and statements.

Commands in GW-BASIC (page 35) (15 minutes)
Explain the function and syntax of the LOAD, LIST, and RUN commands. Although students have not created a program yet, you may ask them to simply type the commands on the computer to become familiar with the interface.

Ask students to complete the Word Whiz exercise given on page 35 of the textbook.

Statements in GW-BASIC (page 36) (15 minutes)
Explain the function and syntax of the REM, INPUT, and PRINT commands. Emphasize the role of quotation marks when using the PRINT statement. Explain that the computer prints text within quotation marks exactly as it is whereas text without quotation marks is displayed after processing. Explain the function of line numbers in a program. Although students have not created a program yet, you may ask them to simply type the statements on the computer to become familiar with the interface.

Explore with Whiz (page 37) (5 minutes)
Ask students to complete the Explore with Whiz exercise given on page 37 of the textbook.

Assign the Whiz's Quiz questions as homework.

Answers

Word Whiz (page 35)
Which verbs in the above text describe the following actions?
to show on the screen: DISPLAY
to continue in force or operation: RUN
to carry out: EXECUTE
to place data in primary storage: LOAD

Explore with Whiz (page 37)
Fill in the blanks.
commands, statements, syntax, program, statement, number

What do these commands and statements enable us to do?
LOAD: move a program from secondary storage to primary storage
PRINT: instruct the computer to display processed data
RUN: execute a program from memory or from a disk
REM: put in a comment in the program
INPUT: enter input data while the computer is executing a program

Whiz's Quiz (page 38)

1. **What is GW-BASIC?**
   GW-BASIC is a programming language that uses simple English words to give instructions to the computer. Programs in GW-BASIC are written using statements and commands consisting of English words, digits, mathematical symbols, and punctuation marks.

2. **Define command and statement.**
   A command is an instruction for the computer to perform a task not related to a specific program. A statement is an instruction for the computer to perform an action within a program.

3. **What is the significance of syntax?**
   Syntax is the set of rules for writing commands and statements in a programming language. Each programming language has its own syntax. We should write commands and statements in the correct syntax to enable the computer to follow those instructions accurately.

4. **List three commands used in GW-BASIC with their functions.**
   Three commands used in GW-BASIC are LOAD, LIST, and RUN.
   The LOAD command is used to bring a program from secondary storage to primary storage so that it can be executed.
   The LIST command instructs the computer to list the steps of a program on the screen.
   The RUN command tells the computer to execute a program.

Answers to Additional Activity
1. b, 2. a, 3. b, 4. c, 5. a

Additional Activity

Select the correct answer for each question.

(1) Which of these are not used in GW-BASIC?
- (a) numbers
- (b) Arabic words
- (c) English words
- (d) punctuation marks

(2) Which of these is not a command used in GW-BASIC?
- (a) PRINT
- (b) LIST
- (c) RUN
- (d) SAVE

(3) Which of these is not a statement used in GW-BASIC?
- (a) INPUT
- (b) RAM
- (c) PRINT
- (d) REM

(4) Commands and statements are types of _____.
- (a) orders
- (b) requests
- (c) instructions
- (d) steps

(5) Each statement begins with a _____.
- (a) line number
- (b) capital letter
- (c) quotation mark
- (d) exclamation mark

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Chapter 5 More about Word Processing

Teaching objectives

The objective of this chapter is to:
- introduce advanced features of Microsoft Word.

Learning outcomes

By the end of this chapter, the students should be able to:
- summarize the different features of a word processing program
- apply and use different Microsoft Word commands.

Suggested number of periods: 2

Period 1

Sample lesson plan for a 40-minute period
This lesson should be conducted in the computer lab.

Starter activity (5 minutes)
Have students open the Microsoft Word program on the computer and brainstorm what a word processing program is used for. Expected responses: writing essays, letters, reports, etc. Ask them what they can do with the help of a word processing program. Expected responses: typing, saving, and printing text; deleting, inserting, and changing text; copying and pasting text, etc.

The Paragraph tab (pages 40 and 41) (20 minutes)
Show the students text with different kinds of alignment. Ask them why the text is aligned differently in each case. Explain that most text is left-aligned, but they can change it to whichever alignment they want, for a single paragraph, a set of paragraphs, or an entire document. Very often, the address in a letter is right-aligned. A poem or a book title is aligned in the centre of the page. Text in newspapers is printed in justified alignment.

Assign the exercise on page 40 to be completed in class.

Write down a shopping list and a recipe on the board. Ask students how these lists should be formatted. Instruct them to use bullets or numbering to format both. Explain the multilevel list feature and explain that it will allow them to create lists within lists, where the lists can be bulleted or numbered—but with the added advantage of being able to combine numbers, letters, and bullets. So, one layer could be bulleted, with a numbered list inside it.

Ask students to make a shopping list on their computers which includes a multilevel list. The shopping list can have different subheadings such as pulses, canned food, toiletries, etc.

The Page Layout tab (pages 41 and 42) (15 minutes)
Introduce the Page Setup group on the Page Layout tab. Explain that the parameters, namely the size, margins, and page orientation defined by the user will determine how a printed page will appear on the screen. Demonstrate the different margin options.

Explain that a gutter margin setting adds extra space to the side margin or top margin of a document that needs to be bound. A gutter margin helps ensure that text is not hidden by the binding.

Demonstrate how to set the gutter margin and ask students to follow the steps:
- Click on Margins in the Page Setup group on the Page Layout tab.
- Click on Custom Margins.
- In the Gutter box, enter a width for the gutter margin.
- In the Gutter position box, click Top or Left.

Similarly, demonstrate the use of the Orientation, Size, and Columns features on the page Layout tab.

Period 2

Sample lesson plan for a 40-minute period
This lesson should be conducted in the computer lab.

The Insert tab (page 43) (10 minutes)
Demonstrate the function and method to insert headers and footers in a document. Ask students to insert the header and footer as required on page 43 of the textbook.

Editing tools (pages 44 to 45) (20 minutes)
Demonstrate the use of the text wrapping, Cut, Copy, Paste, and Paste Special features. Assign the following practice task to students.

1. Type/Copy and Paste a song list into a blank word document.
2. Change the Font type to Bold.
3. Change the color of all misspelled words to red.
4. Correct the spelling of each misspelled word.
5. Italicize all the proper nouns.
6. Set the gutter margin.
7. Add bullets.
8. Set the words 'Song List' in Center alignment. Underline the words.
9. Save the list and close the document.

Check with your students if they remember how to save a document.

Explore with Whiz (page 46) (10 minutes)
Ask students to complete the Explore with Whiz exercises given on page 46 in the classroom.

Assign the Whiz's Quiz questions as homework.

Answers

What alignment would you use for the following? (page 40)
your home address in a letter: right alignment
a grocery list: left alignment
a page in a storybook: generally justified alignment but this could vary

Explore with Whiz (page 46)
State what these tools and features are used for.
1. to align text to the left margin
2. to change text wrapping settings
3. to set page margins
4. to number a list
5. to set page size
6. to set page orientation

Fill in the blanks.
To undo an action, we press the **Control + Z** keys.
When text moves to the next line automatically while typing, it is called **text wrapping**.
If we want to spiral bind a book from the top, we would change the **gutter** settings.
The title of an essay should be aligned in the **centre** of the page.
Before cutting or copying a sentence, it should be **selected**.
Control + Y is a shortcut to **redo** a command.
Landscape and Portrait are types of **orientation**.

Whiz's Quiz (page 47)
1. **What is the Alignment feature used for?**
   The Alignment feature is used to align text on the page. Left, Right, Center, and Justified are different alignment options.
2. **Why is the setting for a gutter margin used for printing books?**
   The setting for a gutter margin is used to add extra space around the margins of a page. The gutter margin space adds white space so that text is not chopped off or hidden in a bound book.
3. **Explain text wrapping.**
   When text automatically moves to the next line after a line is filled it is called text wrapping. Text wrapping also makes text flow around a picture inserted on the page.
4. **When do we use the Paste Special feature?**
   We use the Paste Special feature to paste text in the same format as in the location where it is pasted.
5. **What is the Bullets feature used for?**
   The Bullets feature is used to create a bulleted list or a numbered list.

Answers to Additional Activity
1. b, 2. c, 3. c, 4. d, 5. a

Additional Activity

Select the correct answer for each question.

(1) Center, Right, and Left are types of _____.
- (a) orientation
- (b) alignment
- (c) lists
- (d) text wrapping

(2) Which of these is not found in the Paragraph group?
- (a) alignment
- (b) orientation
- (c) Cut
- (d) bulleted lists

(3) Which tab has the Margins feature?
- (a) Home
- (b) Insert
- (c) Page Layout
- (d) View

(4) Which of these is an option for paper size?
- (a) Gutter
- (b) Special
- (c) Justify
- (d) A4

(5) Which tab has the Header & Footer tool?
- (a) Insert
- (b) View
- (c) Page Layout
- (d) Home

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Chapter 6 Introduction to Desktop Publishing

Teaching objectives

The objectives of this chapter are to
- introduce the different features of desktop publishing
- explain how text and graphics can be used to create a document.

Learning outcomes

By the end of this chapter, students should be able to
- use different tools of Microsoft Publisher
- design flyers, cards, newsletters, and brochures with the help of templates.

Suggested number of periods: 2

Period 1

Sample lesson plan for a 40-minute period
This lesson should be conducted in the computer lab.

Starter activity (5 minutes)
Ask the students to identify a program they could use to design cards, flyers, newsletters, brochures, and other similar materials. Expected response: Microsoft Publisher

Pair work (pages 49 to 53) (25 minutes)
Explain the use and functions of Microsoft Publisher and other desktop publishing programs. Guide students how to access and open the Microsoft Publisher application on the computer. Introduce the terms template and demonstrate how a template can be selected in Microsoft Publisher.

Describe the function of a text box to insert text on a Publisher document. Demonstrate the steps to insert a text box and ask students to insert text boxes of different shapes on their document. Describe the use of typeface, size, and style. Ask students to experiment by writing text and applying different typeface and style features.

Demonstrate the procedure for inserting graphics such as pictures and photographs on the document. Allow students sufficient time to insert different types of graphics on the document.

Exercise (page 54) (10 minutes)
Ask students to design a flyer as required on page 54 of the textbook.

Period 2

Sample lesson plan for a 40-minute period
This lesson should be conducted in the computer lab.

Formatting graphics (page 55) (20 minutes)
Demonstrate the tools in the Arrange group on the Home tab. Ask students to insert several graphics on the document and arrange them in different ways such as by shifting them and using the Bring Forward and Send Backward commands. Ask students to create a flyer in Microsoft Publisher based on the one they had designed in the textbook in the previous lesson.

Text wrapping (pages 56 to 57) (20 minutes)
Demonstrate the text wrapping options on the Picture Tools tab and Drawing Tools tab. Allow students to practise these features when designing their flyer. After the flyer has been created, ask students to save it on the computer and print a copy.

Assign Word Whiz, Explore with Whiz, and Whiz's Quiz as homework.

Answers

Word Whiz (page 57)
What do these words mean?
place: to put in a particular position
overlap: to cover part of the same area
shift: to move or cause to move from one place to another
arrange: to put things in a neat, attractive, or required order

Explore with Whiz (page 58)
Circle the correct answer:

Clip Art/(Text) is a combination of letters, numbers, and symbols.

Text/(Font) has three elements: typeface, size, and style.

Line Art/(Typeface) is a set of letters, numbers, and symbols with the same design.

Layout/(Style) refers to the special effects applied to a typeface.

(Graphics)/Style can be in the form of digital photographs or pictures from clip art libraries.

(Font)/Graphics refers to the way text appears.

Whiz's Quiz (page 59)

1. **What does Microsoft Publisher enable us to do?**
   Microsoft Publisher enables us to combine text and graphics in a single document. It is used to make different documents such as cards, flyers, and newsletters.
2. **What is a template?**
   A template is a standard layout containing basic design elements of the page.
3. **Where are objects placed on a document?**
   Objects are placed in a frame on a document.

4. **How can we select several objects at the same time?**
   We can select several objects at the same time by pressing the Shift key while clicking each object.

5. **Describe text wrapping.**
   Text wrapping is the way in which text flows around the pictures and other elements on a page. Text wrapping features are used to make text flow around graphics as we need to.

Answers to Additional Activity

1. c, 2. d, 3. b, 4. a, 5. b

Additional Activity

Select the correct answer for each question.

(1) A template can be chosen from _____.
- (a) Design Template
- (b) New Template
- (c) Available Templates
- (d) Create Template

(2) Which of these is not included in text?
- (a) words
- (b) numbers
- (c) symbols
- (d) pictures

(3) Calibri, Arial, and Times New Roman are types of _____.
- (a) font
- (b) typeface
- (c) size
- (d) style

(4) Where is the feature for inserting pictures found?
- (a) On the Insert tab
- (b) On the Illustrations tab
- (c) On the Picture tab
- (d) On the Drawing tab

(5) The text wrapping feature is found on the _____ tab.
- (a) Arrange
- (b) Home
- (c) Insert
- (d) Flyer

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Chapter 7 The Internet

Teaching Objectives

The objectives of this chapter are to:
- explain the different uses of the Internet
- explain the importance of instant messaging, chat rooms, social networks, and blogs
- discuss cloud computing.

Learning Outcomes

By the end of this chapter, the students should be able to:
- conclude that instant messaging, chat rooms and social networks have become popular ways of communicating through the Internet
- outline the significance of cloud computing.

Suggested number of periods: 3

Period 1

Sample lesson plan for a 40-minute period

Connecting to the Internet (page 61) (10 minutes)
Discuss the structure and advantages of the Internet. Explain the concepts of DSL cables and wireless Internet connections. Explain how a gateway connects a smaller computer network to the Internet. Discuss the role of an Internet browser and explain how it enables us to view content over the Internet. Emphasize the difference between the Internet and the World Wide Web.

Explain what the term ISP stands for and what kind of service ISPs provided. Point to the screenshot on page 61 and describe the features of an Internet browser.

Uses of the Internet (pages 62 to 64) (30 minutes)
Discuss the different uses of the Internet given on pages 62 to 64 of the textbook. Explain the main features of blogging, instant messaging, chatting, social networking, online gaming, and Internet telephony. Encourage students to share instances where they have participated or observed someone participate in these activities.

Ask students to answer the questions on pages 63 and 64 of the textbook.

Period 2

Sample lesson plan for a 40-minute period

Cloud computing (page 65) (10 minutes)
Introduce cloud computing as an evolved form of the Internet. Explain that cloud computing enables data to be stored on a server space instead of on the hard drive

of a computer. Emphasize the benefits as well as the risks involved with such a move. Discuss examples of cloud computing services and describe their main features.

Explore with Whiz (page 66) (10 minutes)
Ask students to complete the Explore with Whiz exercises given on page 66 of the textbook.

Whiz's Quiz (page 67) (20 minutes)
Help students explore and write down answers to the Whiz's Quiz section in their notebooks. Encourage originality instead of copying text from the chapter.

Period 3

Sample lesson plan for a 40-minute period

Conducting a debate (40 minutes)
It is useful to expose students to debating as a means to test their knowledge and views against those of others. Therefore, this lesson may be devoted to teaching students debating skills.

Debates allow sharing ideas and exploring different topics through well-planned arguments. There must be proper rules and debate moderation to prevent a friendly debate from turning into a shouting match. It is important to have written guidelines. It is also important for both sides to have a clear understanding of the rules. The moderator should be fair. A good moderator conducts the debate without prejudice. The moderator should conduct the debate politely. All debaters also need to be affable, addressing only opposing ideas without insulting their opponents.

Some responses are provided as a reference which the teacher can use to stimulate students.

Advantages of social networking:
- Social networking helps people communicate (updates, chats, debates, discussion) and creates understanding.
- Social networking educates. Many games, puzzles, quizzes, and team activities are available online.
- Social networking brings people closer. It helps people learn about new things and find communities that encourage a hobby.
- Social networking strengthens relationships and helps us to stay in touch with old friends.

Disadvantages of social networking:
- Children are losing face-to-face contact with other people. Teens with gadgets in their hands, tap messages onto screens instead of communicating with real people. Many children feel more comfortable with virtual friends.
- Chatting online weakens people's communication skills.
- Social networking can distract students from their studies.
- Parents and children become distant and spend less time together.
- Some children are not as familiar with privacy settings and their profiles can be easily accessed by any user who logs on to such sites.

- People with bad intentions can access profiles and have direct access to contact information and photographs.

Advantages of social networking for business:
- Appropriate, well-presented content on social media attracts the attention of customers and increases brand visibility.
- Advertising on social media is cheaper than traditional advertising and promotional activities.
- Social media enables companies to maintain contact with customers and respond effectively to feedback.
- Customers can find products through new social media channels.

Disadvantages of social networking for business:
- More resources are required to consistently manage the social media presence.
- Using the network to push sales without engaging directly with customers may not work.
- Failing to respond to negative feedback may damage a company's reputation.

Essay writing
Essay topics have been added at this level to encourage students to write and develop proficiency in developing well-rounded views. Assign essays as a weekend homework assignment. Students should not be expected to write very long essays at this stage.

Ask students to write an essay on the topic 'What would you like to store on the Cloud? How would it benefit you?'

Answers

In your opinion, what are the disadvantages of using social media? (page 63)
Answers will vary depending on students' awareness of social media risks, but most students are likely to identify loss of privacy, intrusion, and waste of time as possible disadvantages.

What do you use the Internet for? (page 64)
Answers will vary.

Explore with Whiz (page 66)
What are they called?
a global network of computers: Internet
a computer network spread over a small area, connected by a link that allows devices to interact: LAN or local area network
a powerful and complex computer used with the Internet: web server
a worldwide collection of information accessed by the Internet: World Wide Web
a company that maintains web servers: Internet service provider (ISP)
storing data and applications on the vast server space: cloud computing
a variety of online web-based applications which allow social interaction between people: social networking
making phone calls over the Internet: online or Internet telephony

Name a company which provides the following services.
cloud storage: Dropbox
social networking: Facebook
instant messaging: Google Talk
Internet telephony: Skype
(Other answers are also acceptable.)

Whiz's Quiz (page 67)

1. **Why do we need an Internet browser?**
   We need an Internet browser to connect to the Internet. We can access websites with the help of an Internet browser.

2. **What are the different uses of the Internet?**
   The different uses of the Internet are browsing the Web for information, sending email, blogging, instant messaging, and the use of chat rooms, and social networking. We can also play games and store information on the cloud.

3. **What is the role of the Internet service provider?**

   The Internet service provider allows users to connect to the Internet through its web server. The user can connect to the ISP's server with a user name and password given by the ISP.

4. **What are the benefits of cloud storage?**
   Cloud storage helps to keep data secure because it cannot be stolen from someone's computer. It saves space on the hard disk and reduces the use of secondary storage devices.

Answers to Additional Activity
1. a, 2. b, 3. d, 4. a, 5. a

Additional Activity

Select the correct answer for each question.

(1) A _____ is required to view content on the Web.
- (a) web server
- (b) website
- (c) web page
- (d) supercomputer

(2) Windows Live Messenger and Google Talk are _____ services.
- (a) chat
- (b) instant messaging
- (c) blogging
- (d) browsing

(3) Which services allows people to have phone conversations on the Internet?
- (a) blogging
- (b) chatting
- (c) email
- (d) Internet telephony

(4) Which of these is a benefit of cloud computing?
- (a) greater storage space
- (b) poorer security
- (c) large servers
- (d) loss of data

(5) Which of these is a social networking site?
- (a) Facebook
- (b) Skype
- (c) Hotmail
- (d) Yahoo!

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Safety on Social Networks

It is important for parents to be educated about the dangers of social media so that they may take reasonable steps to protect their children. Send out a copy of these safety tips to parents explaining to them how they can help their children stay safe on the Internet.

Safety tips on social networks:

- Browse through the social media sites your child visits and check for loopholes.
- Check for privacy settings that can be compromised. Create a separate profile and check how effective the privacy settings are.
- Talk to other parents about security issues on the social sites your children are using.
- Avoid posting photographs. If you do decide to add photos, make sure that your privacy settings are in place.
- Join the sites your children visit. Add your children to your friends list to keep an eye on their activities. However, do not embarrass your children by commenting publicly on their activities/comments.
- Educate your children about social networking and safety.
- Install security software to prevent your children from accessing links that have been classified as adult content.
- Make sure you discuss online interactions with your children regularly. Keeping an open relationship is always a good idea, as your children will inform you if they plan to meet anybody they met online, or if somebody said something inappropriate to them.
- Regulate the amount of time your children spend online. This is important to prevent them from getting addicted to social networking or adopting unhealthy lifestyle habits.
- Join social networks for parents so you can share tips and updates on protecting children online and learn about new privacy features, new social networks, and apps that your children may be interested in.

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Chapter 8 Learning through the Internet

Teaching objectives

The objectives of this chapter are to:
- discuss the advantages of online learning
- introduce e-learning, e-books, and online quizzes.

Learning outcomes

By the end of this chapter, the students should be able to:
- understand how online learning results in a positive learning experience
- list the benefits of e-learning, e-books, and online quizzes.

Suggested number of periods: 3

Period 1

Sample lesson plan for a 40-minute period

Online learning (page 69) (10 minutes)
While discussing online learning and its benefits on page 69 of the textbook, write the following questions on the board and invite students to brainstorm:

How does the Internet help us learn?
Expected responses:
It helps us to share information.
It helps us to have discussions on a particular subject.
It helps us to contact other students or our teachers via email if we have any questions.
It helps us to research for projects.
It helps us to get the latest news via news websites.

How can learning be improved through the Internet?
Expected responses:
A learner can learn at her or his peak learning time.
A learner can learn at her or his own speed.
A learner can focus on specific topics.
A learner can test herself/himself regularly. Also, she/he can take online tests, get instant results, and gauge how well she/he is doing in a subject.
A learner can have better interaction with the teacher.

How do you think learning through the Internet will change in the future?
Expected responses:
The Internet will replace the traditional classroom system.
There will be no need for traditional lectures.
The average class size for an online course may reach up to a thousand learners.
The average cost of an online course will fall.
Learners can choose from thousands of topics.

Podcasts, educational videos, and online tutorials (pages 69 and 70) (15 minutes)
Have different students read out pages 69 and 70. Engage students in a lively discussion about different types of podcasts, videos, and tutorials available on the Internet. Give specific examples of such content that is appropriate for their age and interest so that they may view the content on their home computers.

E-books, online encyclopedias, and dictionaries (pages 71 and 72) (15 minutes)
Following the strategy for the previous topics, discuss the different types of e-books, encyclopedias, and dictionaries available online.

Period 2

Sample lesson plan for a 40-minute period
This class may be conducted in the computer lab.

Collaborative learning, educational games, and interactive quizzes (pages 72 and 73) (15 minutes)
Explain the terms collaborative learning and peer feedback to students. Discuss various examples of collaborative learning and identify specific software that facilitate online learning. Similarly, discuss online games and quizzes that can help students improve their knowledge and skills in different subjects.

Ask students to complete the Word Whiz exercise on page 73 of the textbook.

Assign the second Explore with Whiz exercise and Whiz's Quiz as homework. Encourage them to write in their own words rather than copy from the chapter.

Lab work (25 minutes)
Identify different websites that offer some of the online learning tools discussed in this chapter. Alternatively, you may ask students to search for such podcasts, videos, tutorials, e-books, games, or quizzes. Make sure you have a good web filter to keep out inappropriate content. Allow students to use any of these tools to enhance their knowledge.

Period 3

Sample lesson plan for a 40-minute period

Debate practice (20 minutes)
Organize a short, lively debate on the advantages and disadvantages of e-books.

Expected responses
Advantages:

- E-books are environmentally friendly as no paper or ink is needed.
- E-books do not wear out over time.
- E-books can be read in dim lighting.
- Digital books can be interactive.
- E-books can be read in different places.
- E-books are not heavy to carry around.
- We can save money as some e-books are free.

Disadvantages:

- Some people prefer paper books to electronic books. They like to actually hold the books while reading.
- E-books can cause problems for people who have limited access to computers.
- E-books can cause problems for people who are technologically challenged.

Explore with Whiz (20 minutes)
Ask students to read the first Explore with Whiz exercise on page 74 of the textbook. Explain the topic and ask students to take a position on it. Allot specified time for students to prepare their points as they did for the debate topic earlier. Then ask them to present their views one by one.

Essay writing
Essay topics have been added at this level to encourage students to write and develop proficiency in developing well-rounded views. Assign essays as a weekend homework assignment. Students should not be expected to write very long essays at this stage.

Ask students to write an essay on the topic 'Interactive online learning will revolutionize education.'

Answers

Word Whiz (page 73)
Match the words with similar meanings.
quiz: test
program: software
answer: reply
score: tally

Explore with Whiz (page 74)
Place a tick mark next to the statements that represent a favourable learning environment for students and a cross next to the statements that do not.

1. Students suggesting improvements to each other's work **(✔)**
2. Whiz taking a test online **(✔)**
3. Teacher hitting a student **(✗)**
4. Student watching an educational video **(✔)**
5. Teacher posting assignments on the Internet **(✔)**

Whiz's Quiz (page 74)

1. **How does online learning support education?**
   Online learning supports education by enabling students to learn from the Internet after classroom learning. Students can view tutorials and videos about things they do not understand in the classroom. They can also play games and quizzes to test their understanding.

2. **What are the advantages of e-books?**
   E-books can be viewed on portable computers. They can be downloaded from the Internet at any time and saved on the computer. They do not take up any shelf

space and are easy to store. Bookmarking and notes features can be used with e-books.

3. **How do online quizzes help students?**
   Online quizzes help students to test their knowledge in a fun and interesting way by answering questions and scoring points.

4. **Describe the online learning tools Whiz should use to complete an essay on the importance of programming.**
   Whiz should listen to a podcast about computer programming. He should also view an online tutorial to see how programming is done. Whiz can read an e-book or online encyclopedia to collect information about different types of programming. He can use an online dictionary to look up meanings of difficult words.

Answers to Additional Activity
1. b, 2. d, 3. a, 4. c, 5. d

Additional Activity

Select the correct answer for each question.

1. What is the term used for an online lecture?
   a. tutorial
   b. podcast
   c. quiz
   d. game
2. Which of these is an appropriate tool for showing a science experiment?
   a. blog
   b. podcast
   c. e-book
   d. online video
3. Where can Whiz find information about Ancient Greece online?
   a. online encyclopedia
   b. online tutorial
   c. video
   d. online quiz
4. Which of these is not part of online collaborative learning?
   a. uploading an assignment
   b. sharing comments
   c. writing in a notebook
   d. suggestions from classmates
5. Online games can help us test _____.
   a. spelling
   b. knowledge
   c. skills
   d. all of the above

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Chapter 9 Whiz Loves Robots

Teaching objectives

The objectives of this chapter are to:
- introduce robots
- explain the different environments in which robots are used.

Learning outcomes

By the end of the lesson, the students should be able to:
- explain how a robot functions
- identify the different jobs that robots can perform.

Suggested number of periods: 2

Period 1

Sample lesson plan for a 40-minute period

Starter activity (5 minutes)
Show a picture of a robot to the students (or draw one on the board) and ask them if they know what this device is called. Brainstorm the characteristics of a robot and jot down the responses around the picture of the robot. Encourage students to think about how robots are different from humans.

Expected responses: Robots are programmable, electronically operated, mechanical units/machine, do not need to be fed, never get tired, can endure physical conditions that are uncomfortable or even dangerous, can operate in airless conditions, do not get bored by repetition, cannot be distracted from the task at hand.

Features of a robot (page 76) (10 minutes)
Discuss the features of a robot while reading page 76 of the textbook. Describe the places where robots are used at present and where they may be used in future.

Students may be asked to perform the following tasks in pairs:

Task 1: List down, in pairs, the functions you think robots can perform and the different places where they can be used.
Expected responses: cleaning/sweeping, packing, in manufacturing, in labs, on the moon, in space, etc.

Task 2: What kinds of tasks can a robot perform that a human cannot? Give reasons for your answer.
Expected responses: Robots are especially suitable for certain work functions because, unlike humans, they never get tired, they can endure physical conditions that are uncomfortable or even dangerous, they can operate in airless conditions, they can carry heavy loads, they do not get bored by repetition, and they cannot be distracted from the task at hand, etc.

Ask students to complete the exercise given on page 76.

Types of robots (pages 77 to 81) (25 minutes)
Discuss the different forms of robots given on pages 77 to 81 of the textbook. Explain the use of robotic arms, household robots, industrial robots, telerobots, and chat robots. Discuss the examples of these robots given in the book and ask students to think of some more examples.

Assign the exercises on pages 77 to 81 of the textbook as homework.

Period 2

Sample lesson plan for a 40-minute period

Explore with Whiz (page 82) (20 minutes)
Ask students to complete the Explore with Whiz exercises given on page 82 of the textbook. Students may be allotted additional time to complete the paragraph exercise. Explain to students that they should brainstorm and list the points they want to include in their paragraph instead of diving into writing the paragraph straightaway.

Whiz's Quiz (page 83) (20 minutes)
Help students explore and write down answers to the Whiz's Quiz section in their notebooks. Encourage originality instead of copying text from the chapter.

Essay writing
Essay topics have been added at this level to encourage students to write and develop proficiency in developing well-rounded views. Assign essays as a weekend homework assignment. Students should not be expected to write very long essays at this stage.

Ask students to write an essay on the topic 'Robots—Why Human Beings Felt the Need to Invent Them'

Additional information
Robots are programmable, self-controlled devices made up of electronic, electrical, and mechanical units. Simply put, robots are machines that take the place of human beings. Although they replace humans, they do not necessarily look or act like humans. However, they do need to be flexible to perform certain specialized tasks.

Early industrial robots handled radioactive material in atomic labs, a task that was filled with dangers for human beings. Present-day robots have advanced sensory systems that process information and appear to function as if they have brains. Their 'brain' is actually a form of computerized artificial intelligence (AI) which permits them to identify conditions and then appropriately decide upon a course of action. It is AI that makes robots different from regular machines.

Robot Timeline

- 270 BC: An ancient Greek engineer named Ctesibius made organs and water clocks with movable figures.
- 1818: Mary Shelley wrote 'Frankenstein', which was a novel about a frightening artificial life-form created by Dr. Frankenstein.
- 1921: The term 'robot' was first used in a play called 'R.U.R.' or 'Rossum's Universal Robots' by Czech writer Karel Capek. The plot was simple: Man makes robot; then robot kills Man!
- 1941: Science fiction writer Isaac Asimov first used the word 'robotics' to describe the technology of robots and predicted the rise of a powerful robot industry.
- 1942: Asimov wrote 'Runaround', a story about robots which contained the 'Three Laws of Robotics':
  A robot may not injure a human, or, through inaction, allow a human being to come to harm.
  A robot must obey the orders of human beings except where such orders would conflict with the First Law.
  A robot must protect its own existence as long as such protection does not conflict with the First or Second Law.
- 1948: 'Cybernetics', an influence on artificial intelligence research, was published by Norbert Wiener.
- 1956: George Devol and Joseph Engelberger formed the world's first robot company.
- 1959: Computer-assisted manufacturing was demonstrated at the Servomechanisms Lab at MIT.
- 1961: The first industrial robot was online in a General Motors automobile factory in New Jersey. It was called UNIMATE.
- 1963: The first artificial robotic arm to be controlled by a computer was designed. The Rancho Arm was designed as a tool for the handicapped and its six joints gave it the flexibility of a human arm.
- 1965: DENDRAL was the first expert system or program designed to execute the accumulated knowledge of subject experts.
- 1968: The octopus-like Tentacle Arm was developed by Marvin Minsky.
- 1969: The Stanford Arm was the first electrically powered, computer-controlled, robotic arm.
- 1970: Shakey was introduced as the first mobile robot controlled by artificial intelligence. It was produced by SRI International.
- 1974: A robotic arm (the Silver Arm) that performed small-parts assembly using feedback from touch and pressure sensors was designed.
- 1979: The Stanford Cart crossed a chair-filled room without human assistance. The cart had a TV camera mounted on a rail which took pictures from multiple angles and relayed them to a computer. The computer analyzed the distance between the cart and the obstacles.

Answers

Tick (✔) the statements that are true. (page 76)

1. Robots need air to breathe. ☐
2. A robot can be programmed. ✔
3. Robots often behave in the same way as humans. ☐
4. Robots cannot follow directions. ☐
5. In factories, robots are used to place packets of biscuits into cartons. ✔

If you had a personal robot, what kind of tasks would you like it to do for you? (page 78)
Answers will vary.

Word Whiz (page 78)
State what is meant by the following:
automation: the use of computer programs to control machines
manipulation: handling and controlling

Word Whiz (page 79)
Find adjectives that fit these meanings.
something that needs to be done over and over again: repetitive
likely to cause harm or injury: dangerous
poisonous: toxic

What kind of jobs do you think robots will do in the future? (page 81)
Answers will vary.

Explore with Whiz (page 82)
What are these called?
robot, artificial intelligence, telerobot, nanotechnology, chatbot

Whiz's Quiz (page 83)

1. **What are robots and why are they widely used?**
   Robots are machines controlled by computers to do different types of work. They are widely used because they can do a lot more work than humans, even in difficult and dangerous environments.
2. **Why are robots used for repetitive jobs?**
   Robots are used for repetitive jobs because they do not become bored or tired by performing these over and over again.
3. **Would you prefer a robot or a human worker? Why?**
   I would prefer a robot worker for repetitive jobs that do not require intelligence or communication with other humans. For jobs where intelligence and communication are required, I would prefer a human worker.

4. **How are robots used in the medical world?**
   Robots are used in the medical world to perform surgery. Robots can be used to perform surgeries by controlling robotic arms by a computer in a distant location.

5. **What purpose does a chat robot serve?**
   A chat robot stimulates human conversation using artificial intelligence. This makes people feel that they are communicating with a real person.

Answers to Additional Activity
1. d, 2. c, 3. a, 4. a, 5. b

Additional Activity

Select the correct answer for each question.

(1) Where are robots used?
- (a) factories
- (b) homes
- (c) space
- (d) all of the above

(2) What is the most common form of robots used in factories?
- (a) chatbots
- (b) robotic vehicles
- (c) robotic arms
- (d) welding robots

(3) Which of these would you find in a robot used for mining?
- (a) drilling tool
- (b) welding tool
- (c) wheels
- (d) surgical knife

(4) Which of these is not a kind of telebot?
- (a) chat robot
- (b) space robot
- (c) military robot
- (d) medical robot

(5) Space robots are also called _____.
- (a) rockets
- (b) space rovers
- (c) space shuttles
- (d) space stations

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Chapter 10 The Future of Computers

Teaching objectives

The objectives of this chapter are to:
- discuss the latest developments in the computing world
- familiarize students with brain-computer and hands-off interfaces.

Learning outcomes

By the end of this chapter, the students should be able to:
- review the development of different interfaces and devices.

Suggested number of periods: 1

Period 1

Sample lesson plan for a 40-minute period

Starter activity (5 minutes)
Brainstorm the places where computers are used. Write responses on the board in the form of a web.

Expected responses: at home, in schools, in offices, in banks, in shops and supermarkets, at airports, in libraries, in hospitals, in factories, etc. Then ask students how they envision computers being used in these places 5 or 10 years from now.

Wearable computers (page 85) (10 minutes)
Introduce the concept of wearable computers and discuss the different types of wearable computers already being discussed on television and in cyberspace. Brainstorm the different applications for which wearable computers could prove invaluable.

Ask students to answer the question given on page 85 of the textbook.

The future of human-computer interface (pages 86 and 87) (20 minutes)
Revise what a human-computer interface means. Students have discussed this when learning about Microsoft Windows in earlier classes. Explain the emergence of brain-computer interface, voice-computer interface, and hands-off interface. Discuss how these interfaces operate and the different ways in which they are used. Ask students to think of situations where they would find these kinds of interfaces useful.

Ask students to answer the question on page 87 of the textbook.

RFID technology (page 88) (5 minutes)
Introduce the term RFID and explain what it means. Explain how RFID technology works and discuss its present application in automatic door sensors, etc. Ask students to think of ways in which RFID could become more useful in future.

Assign the Explore with Whiz exercises on page 89 and Whiz's Quiz on page 90 as homework.

Answers

Explore with Whiz (page 89)
Identify the different devices. What are they used for?
Clockwise from top-left:
RFID. It is used to control electronic appliances from a computer.
Brain-computer interface. It is used to help a physically challenged person control a wheelchair without using his hands.
Hands-off interface. It is used to enable a person compose an SMS message by speaking into his phone.

Whiz's Quiz (page 90)

1. **What are wearable computers?**
   Wearable computers are computers that can be worn by users. Wearable computers are designed in the form of common objects that people are used to wearing on their body such as wristwatches, spectacles, and clothes. Wearable computers come with different applications for email and data storage.
2. **Explain what a brain-computer interface attempts to do.**
   A brain-computer interface attempts to receive and transmit signals produced by our brain. The brain-computer interface transmits these signals to devices connected to a computer to control them.
3. **What is voice-recognition technology?**
   Voice-recognition technology enables a person to give voice or oral commands to a computer. The computer recognizes our sound and processes the oral command to perform the required task.
4. **What are RFID tags used for?**
   RFID tags are used to control devices from a distance without any wired connections. The RFID tags give off signals that travel through air and are received by a nearby computer.

Answers to Additional Activity

1. b, 2. c, 3. a, 4. b, 5. b

Additional Activity

Select the correct answer for each question.

(1) A computer in the form of a wristwatch or a pair of spectacles is a form of _____.
   (a) brain-computer interface
   (b) wearable computer
   (c) hands-off interface
   (d) RFID

(2) Which of these can be used to control the air conditioner by a computer?
   (a) hands-off interface
   (b) wearable computer
   (c) RFID
   (d) voice-computer interface

(3) Which of these is likely to be performed with a hands-off interface?
   (a) composing an SMS message
   (b) moving a wheelchair
   (c) starting up a car
   (d) performing surgery

(4) Brain-computer interfaces have been developed perfectly?
   (a) True
   (b) False

(5) Wearable computers will become available at least 10 years from now.
   (a) True
   (b) False

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