New edition Log on to IT

Questions and answers 1

Fill in the blanks

1 A set of instructions that a computer needs to carry out its tasks is known as a **program**.

2 **Data** is a set of raw facts and figures.

3 **Input devices** are used to get the data and instructions into the computer for processing.

4 A computer system consists of both **hardware** and **software**.

5 Processing takes place in that part of the computer known as the **central processing unit (CPU)**.

6 The **control unit (CU)** directs and coordinates all the activities within the CPU.

7 A **machine cycle** is the sequence of instructions performed to execute one program instruction.

8 The **arithmetic and logic unit (ALU)** performs all the arithmetic and logic functions in a computer.

9 **The main memory** holds data and instructions that the computer is processing at the time.

10 **Output devices** translate information processed by the computer into a form that the user can understand.

True or False?

1 Data and information are the same. **False**

2 Computer science is the study of both computer hardware and software design. **True**

3 The CPU is the main part of the computer. **True**

4 All the data is processed in the memory unit. **False**

5 The CU sends data from the memory to the ALU for processing. **True**

6 Output devices translate information processed by the computer into a form that the user can understand. **True**

7 A computer that is required for gaming does not need a fast processor. **False**

8 Input, processing and output are the three stages of data processing. **True**

9 A register is a permanent storage location. **False**

10 Technology has improved communities by providing better communications systems. **True**

Multiple-choice questions

1 Which of the following might be associated with computer science?

a The study of data, data processing and information management

b The use of computer hardware, software and telecommunications devices to store, manipulate, convert, protect, send and receive data

c The study of both computer hardware and software design

d None of the above

2 Which is not an example of a peripheral device?

a Keyboard **b** Mouse

c Register **d** Speakers

3 A program is a:

a hardware device. **b** memory device.

c set of instructions. **d** register.

4 Which device is not found in the CPU?

a ALU **b** Control unit

c Memory **d Printer**

5 The ALU processes data and stores it in:

a a flash drive. **b the main memory.**

c a sound card. **d** modem.

6 Which of the following is not a function of the CU?

a Fetches instructions from memory **b** Decodes instructions

c Processes instructions **d** Fetches data for required instructions

7 The speed at which a CPU processes data to convert it, is measured in:

a megabytes. **b gigahertz.**

c gigabytes. **d** terabytes.

8 Registers are used to store data and instructions that:

a are needed over a long period of time. **b are needed immediately and often.**

c are needed at start up. **d** are needed to hold the program that is being used.

9 The main memory of a computer is also referred to as:

a immediate access store. **b** auxiliary storage.

c secondary storage. **d** backup storage.

10 Which of the following is an example of technology use in the home?

a Keeping track of student progress **b** Better teamwork

c Entertainment **d** Enhanced productivity

Short-answer questions

1 Explain the difference between the terms 'computer' and 'computer system'.

A **computer** is a programmable electronic device, which processes data following a set of instructions. It is a single device to which peripherals can be attached.

A **computer system** refers all the hardware and software required for the computer to work. This includes the computer itself plus the monitor, keyboard, mouse, printer and any other peripherals needed.

2 Explain the difference between the terms 'ICT', 'IT' and 'computer science'.

Information and communications technology (ICT) involves the use of computer hardware, software and telecommunication devices to store, manipulate, convert, protect, send and receive data.

Information technology (IT) deals with the study of data and data processing, and may also apply to the management of computer systems, particularly in a business setting.

Computer science is the study of both computer hardware and software design.

3 Define the terms 'hardware' and 'software'.

Hardware is all the physical parts of the computer system that you can see and touch.

Software is a set of instructions (called a program), that a computer needs to carry out its tasks.

4 Using examples, explain the difference between 'data' and 'information'.

Data is all the raw facts and figures that a computer processes. For example: Data could be a list of some students' favourite colour such as (red, blue, yellow, blue, green, blue, red, yellow, blue, red, blue).

Information is organised data that brings out meaning. It is produced when data is processed to give meaning. For example: If the number for each favourite colour is counted (three red, five blue, two yellow, one green) and placed in a table, then you can get information such as: *The most popular colour is blue.* and *The least favourite colour in the list is green.*

5 Draw a diagram showing the THREE stages of processing.

Diagram to show the three stages of processing: Input → Processing → Output

6 Using an example, explain the data processing cycle.

An example to explain the data processing cycle: It is required to find the average of a child's Mathematics and English scores.

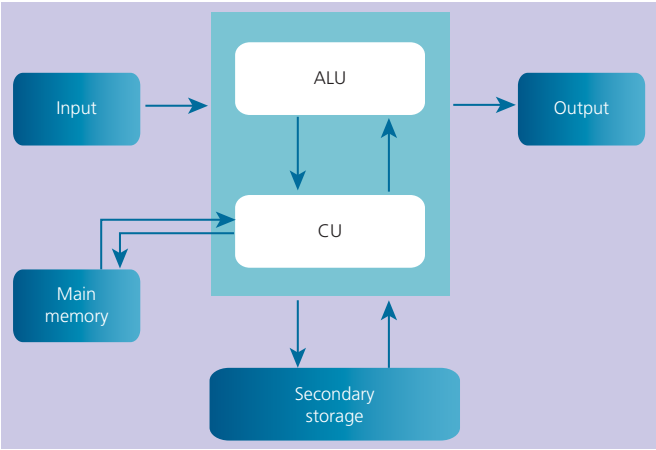
Input is typing the two scores, using the keyboard.

Processing is adding the two scores and dividing the result by two to get the average.

Output is displaying the average on the screen or printing it on paper.

7 Draw a block diagram to illustrate the main components of a computer system.

A block diagram to illustrate the main components of a computer system:



8 Describe the functions of the TWO main units found in the central processing unit.

The **control unit (CU)** directs and coordinates all the activities within the CPU. It determines the sequence in which instructions are executed. It sends the data and instructions to the ALU for processing.

The **arithmetic and logic unit (ALU)** performs all the arithmetic and logic functions in a computer. Arithmetic functions involve the use of mathematical operators such as + – / and ×. Logic functions involve comparisons between two values to determine if they are: equal to, greater than, less than, greater than or equal to, less than or equal to, not equal to.

9 Explain the purpose of the following devices.

a Input device

b Output device

c Main memory

a An **input device** carries data or instructions from the user to the computer.

b An **output device** converts results from the computer into a form the user can understand. It carries results or information from the computer to the user. Examples of output devices are: monitor/screen, visual display unit (VDU), speakers, plotters, printers.

c The **main memory** holds data and instructions that the computer is processing at the time.

10 State FIVE reasons why computers are used.

The reasons why computers are used:

- for their data-processing speed
- for their data-processing accuracy
- for storing large amounts of information in a small space
- for their ability to work continuously
- they allow us to communicate easily with people all around the world.

11 Technology has moved into almost every aspect of our daily lives.

a List THREE ways in which technology has made our lives easier in our homes.

b List THREE ways that technology has enhanced productivity at the workplace.

a Ways in which technology has made our lives easier in our homes:

- Family members can stay in touch using cell phone text and calls.
- Adults can stay home and shop online, pay bills online.
- Paying bills online can be safer (if the user has security measures on the computer) and is usually less time consuming than leaving home.
- Homeowners can have smart switches, plug adapters or timers installed to switch off the power after a certain time without them even being in the room.
- The point above helps to save electricity.

(Any three)

b Ways that technology has enhanced productivity at the workplace:

- Technology allows for greater collaboration.
- It allows for better organisation.
- Technology allows for greater flexibility.
- It creates enhanced productivity.

(Any three)

12 Technology has improved education and learning processes.

a Explain TWO ways in which technology can be used to assist the teacher.

b Describe an example of how you use technology to assist you with your studies.

a Ways in which technology can be used to assist the teacher:

- Teachers can use the internet to research the topics they have to teach.
- She or he can find lesson plans, exams and videos to teach students a certain topic.
- She or he can email students homework and also receive their responses via email.
- Using emails saves the teacher time, in that, they no longer have to pre-prepare the work and find students to get their assignments.
- Immediate exam feedback will help students focus and correct what they did wrong while it is still fresh in their minds.
- Activities involving technology, such as video playing, helps to motivate students.

(Any two. There are other possible answers. Accept any that are sensible.)

b Example of how you use technology to assist you with your studies:

- The student can link up with a study group through social media.
- The student can ask the people in the study group questions with which they have difficulty.
- Someone in the study group will provide answers.

(Any one. There are other possible answers. Accept any that are sensible.)

Research questions

1 Use the internet to conduct research to answer the following questions.

a State the names of THREE manufacturers of computer processors.

b Create a table with the name of the manufacturer and their latest processors.

a Examples of the names of three manufacturers of computer processors are: Broadcom Inc, Ingenic Semiconductor, Marvell.

b

Name of manufacturer	Latest processors
Broadcom	AMD Ryzen 9 3950X DirectX 12.00
Ingenic	AMD Ryzen Threadripper 3960X DirectX 12.00
Marvell	Intel Core i9-10980XE Extreme Edition Processor DirectX 12.00

2 Use the internet or conduct research to find out about the negative impacts of computers in:

a the school.

b the home.

c the workplace.

d the community.

Here are some examples of the negative impacts of computers in the four areas. Students may have other ideas. Accept any that are sensible.

a In the school:

- loss of good handwriting skills
- development of repetitive strain injuries if using computers too much or for too long if computers are placed at the wrong height or at a badly designed workstation
- vision impairment from looking at the screen for too long
- more opportunities for cheating
- source of distraction.

b In the home:

- negative impact on friendships and family relationships
- computer addiction
- drowsiness, difficulty concentrating, and depression of the immune system as a result of lack of sleep in a family member who is addicted
- depression
- children being bullied on social media
- lack of exercise, which can lead to poor overall physical condition and even obesity
- repetitive strain injuries from pressing buttons on a computer or games controller.

c In the workplace:

- managers' tracking of employees' movements, which can lead to low morale
- distraction of employees if they read personal emails or do internet searches for themselves
- system failures, which can lead to lowered production
- cybercrimes.

d In the community:

- expensive to set up, so many people may not be able to afford it, therefore creating a digital divide in society
- embarrassment or depression/lack of self-esteem in people who are not computer literate
- reduction in jobs.

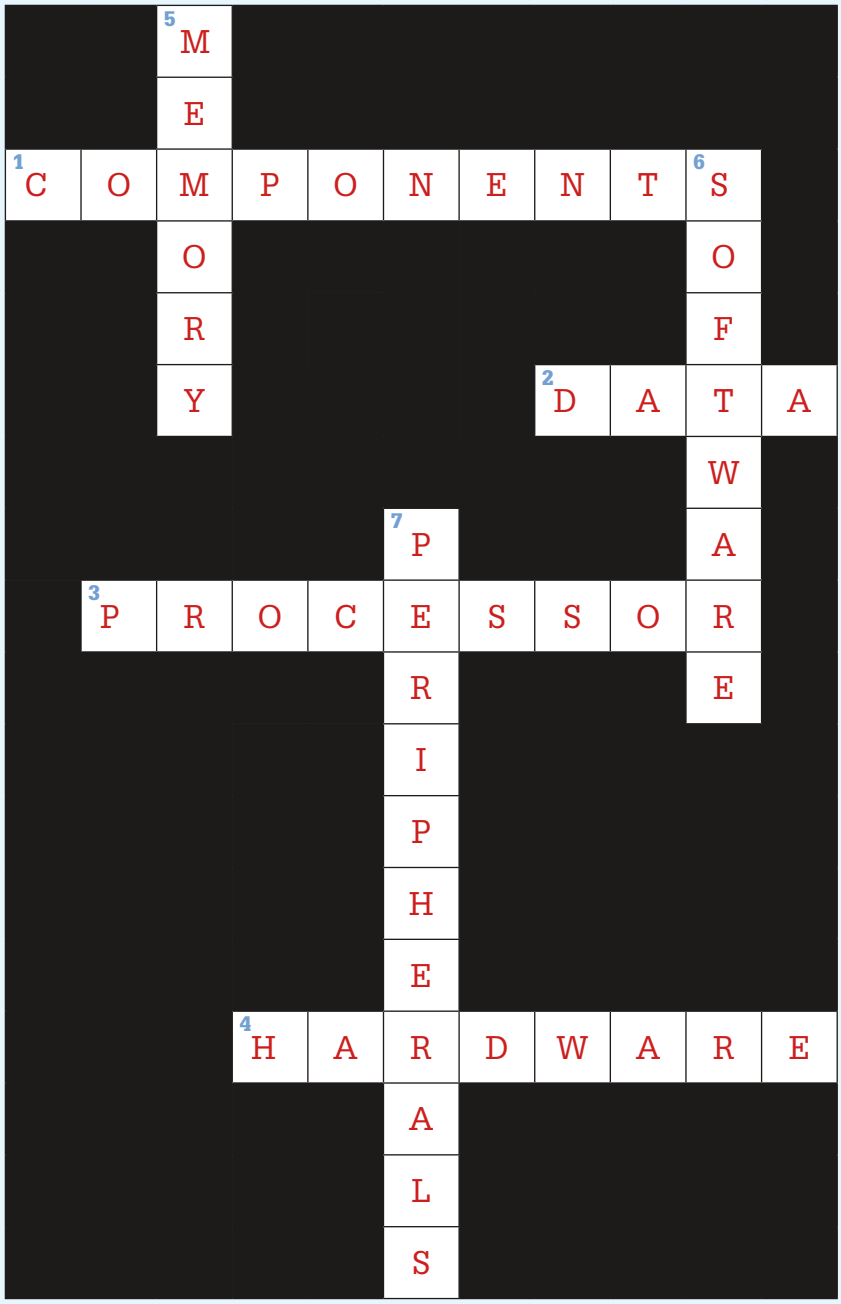
3 Collect data in your school to determine for what purposes students use a cell phone. Analyse the data and present the information to your teacher.

Students' data and results will vary.

Did the student prepare a well-thought-out survey sheet?

Was the student able to analyse the data accurately and then present the information in a logical way?

Crossword



Across

1 The internal hardware devices that make up a computer and ensure its functionality (10)

2 All the raw facts and figures that a computer processes by following a program (4)

3 Sometimes referred to as the 'brain' of the computer (9)

4 All the parts of a computer system that you can see and touch (8)

Down

5 The part that holds data and instructions, which the computer is processing at the time (6)

6 A set of instructions that a computer needs to carry out its tasks (6)

7 Hardware devices that are not essential to a computer's function (11)

Questions and answers 2

Fill in the blanks

1 A PC consists of a **system unit**, a keyboard, a **mouse** and a display screen.

2 A **netbook** is a small, light, low-power notebook with less processing power than a full-sized laptop.

3 Data can be entered through the digitising tablet with the use of a special pen called a **stylus**.

4 An **embedded** computer is a special-purpose computer that is used inside a device to handle specific functions.

5 A video game **console** is a highly specialised desktop computer used to play video games.

6 A **game controller** is used by players to interact with computer games.

7 The Apple Watch® is an example of a **wearable** computer.

8 Computers can be broadly classified into **five** generations.

9 First-generation computers were programmed using **machine** language.

10 The vacuum tube or valve was the main electronic component of **first**-generation computers.

True or False?

1 A laptop computer is a portable version of a PC. **True**

2 Notebooks are just as powerful as a desktop PC. **True**

3 Notebooks cost less than a desktop PC. **False**

4 A mainframe can handle more than a thousand users at one time. **True**

5 An embedded computer is housed on a single microprocessor board. **True**

6 First-generation computers were based on the integrated circuit (IC) or chip. **False**

7 High-level programming languages were used in third-generation computers. **True**

8 Fifth-generation computers use ultra-large-scale integration (ULSI) chips. **True**

9 The Cray T3E 900 and GRAPE are examples of personal computers. **False**

10 The most popular computers today are mainframe computers. **False**

Multiple-choice questions

1 ENIAC was the first:

a electromechanical computer. **b electronic computer.**

c computer with integrated circuits. **d** microcomputer.

2 Complex scientific research is usually done using:

a microcomputers. **b supercomputers.**

c minicomputers. **d** mainframe computers.

3 The main component that formed the basis for second-generation computers was:

a vacuum tubes. **b** registers.

c integrated circuits. **d transistors.**

4 Third-generation computers were used during:

a 1933–1945. **b** 1945–1956.

c 1956–1963. **d 1964–1970.**

5 Which generation of computers used ultra-large-scale integration (ULSI)?

a First generation **b** Second generation

c Third generation **d Fourth generation**

6 All of the following are portable computers except:

a laptop computers. **b** notebook computers.

c tablet computers. **d video game consoles.**

7 A tablet is a computer that looks like a notebook computer except that data can be entered using:

a a keyboard. **b** a mouse.

c a stylus. **d all of these**

8 The Apple Watch® is an example of:

a a wearable computer. **b** an embedded computer.

c a first-generation computer. **d** a video game console.

9 An embedded computer can be found in a:

a laptop computer. **b** desktop computer.

c washing machine. **d** netbook computer.

10 Which of the following computers is connected to sensors and actuators that convert an electrical control signal into a physical action?

a Laptop computer **b** Desktop computer

c Wearable computer **d Embedded computer**

Short-answer questions

1 Describe the features of a personal computer (PC).

The features of a **personal computer (PC)**, also called desktop computer or microcomputer, are:

- They are the most common type pf computer.
- They are designed to be used by one person at a time and can usually fit on an office desk.
- A PC consists of a system unit, a keyboard, a mouse and a display screen, and has all the functional elements found in any larger system.
- PCs are designed to work at incredible speed, accuracy, diligence and versatility.
- They have a large storage capacity.

2 Explain the difference between a mainframe computer and a supercomputer.

A **mainframe computer** focuses on problems that are limited by input/output and reliability.

A **supercomputer** focuses mainly on problems that are limited by calculation speed.

3 **a** State TWO reasons why a bank may want to purchase a mainframe computer.

b Differentiate between a notebook computer and a sub-notebook computer.

c What is an embedded computer?

a Reasons why a bank may want to purchase a mainframe computer:

- A mainframe can handle thousands of users simultaneously (at the same time).
- Mainframes perform tasks that require a lot of computational power. These tasks typically involve bulk data processing such as bank transaction processing.

b A **notebook computer** is portable, weighs between 2 kg and 3 kg and is roughly the size of a large thick notebook. It has a fairly large LCD colour screen (30–35 cm across) and keyboard, usually with a small touch-sensitive pad (the mouse).

A **sub-notebook computer** is an easily portable device that weighs between 1 kg and 1.5 kg. It has a small screen, and a small keyboard, but no mouse function. Sub-notebooks can perform many functions of notebooks, but not to the same level.

c An **embedded computer** is a special-purpose computer that is used inside a device to handle specific functions. It is housed on a single printed circuit board that provides the circuitry needed for a microprocessor, and is connected to sensors and actuators. Examples of items in which embedded computers are used: answering machines, smart televisions, washing machines, cameras, cars, motors, sewing machines, clocks and microwave ovens.

4 **a** Explain the term 'wearable computer'.

b Give THREE examples of wearable computers.

c State THREE applications used by wearable computers.

a A wearable computer can be worn or carried on the body, for example, on the wrist.

b Three examples of wearable computers:

- wearable camera
- smartwatch
- fitness tracker.

c Three applications used by wearable computers are:

- healthcare monitoring systems
- general-purpose computing
- sensory integration.

5 **a** What is a supercomputer?

b State TWO uses of supercomputers.

c Give TWO examples of supercomputers currently in use.

a A **supercomputer** is the largest, fastest and most powerful of computers at present. It is typically used for 'number crunching' in scientific simulations, scientific research and development in areas such as energy, space exploration, medicine and industry.

b Two examples of the uses of supercomputers are:

- weather forecasting
- climate reading.

Students may have other answers. Accept any that are correct.

c Two examples of supercomputers that are currently in use:

- CRAY Titan
- IBM Sequoia.

Students may have other answers. Accept any that are correct.

6 **a** Which type of chip is used in fifth-generation computers?

b What are some of the features of fifth-generation computers?

a Ultra-large-scale integration (ULSI) chips are used in fifth-generation computers.

b Some of the features of fifth-generation computers:

- They can accept spoken-word instructions (voice recognition).
- They can be used to help doctors in making diagnoses (expert systems).

7 List the component that formed the basis of the first four generations of computers.

The component that formed the basis of the first four generations of computers:
First generation – vacuum tubes
Second generation – transistors
Third generation – integrated circuit (IC) chip
Fourth generation – very large-scale integration (VLSI) chip.

8 **a** What is a quantum computer?

b How is a quantum computer different from a digital computer?

c Give TWO possible problems that may be solved by quantum computers.

a A **quantum computer** is a computer that is able to solve problems that would be impractical or impossible for a digital computer to solve. It makes use of the quantum states of subatomic particles to store information.

b A **digital computer** uses 0 or 1 as separate bits.

A **quantum computer** represents both a 1 and a 0 at the same time. A qubit consists of 2 bits and is the basic unit of quantum physics.

c Two examples of possible problems that may be solved by quantum computers:

- They can be used to explain complex molecular and chemical interactions, which could lead to the discovery of new medicines and materials.
- Quantum computers could make aspects of artificial intelligence (AI), such as machine learning, much more powerful.

Research questions

1 Work with your classmates to do research on the internet to find out how a portable computer can help the following professionals with their work:

a A teacher
b A police officer
c A newspaper reporter
d A sales representative

Examples of how a portable computer can help the following professionals with their work

a A **teacher** can benefit by being able to:
- foster online collaboration with other students
- provide curriculum support and additional information to students
- promote better organisation; with the help of the teacher, laptops can help students to keep track of their assignments and they can make use of an online school calendar.

b A **police officer** can benefit by being able to:
- improve his or her record-keeping
- access databases
- keep in touch with headquarters and other offices/agencies, especially in cases of emergencies, when he or she may need help.

c A **newspaper reporter** can benefit by being able to:
- investigate and research online
- write and deliver their stories online much faster.

d A **sales representative** can benefit by being able to:
- record accurate sales numbers, discounts and profit and loss
- keep records of transactions.

Accept any sensible answers from students.

2 Do research on the internet and make a list of the top FIVE personal computers and laptop computers at present.

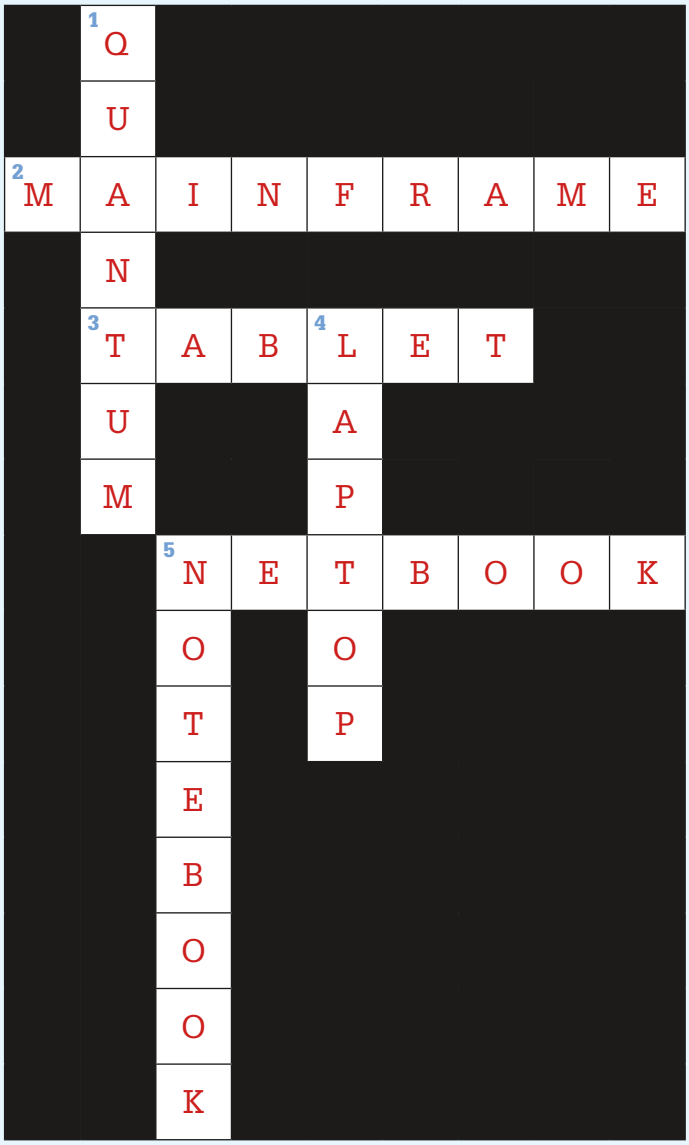
The top five personal computers and laptop computers at present will vary. Here are some examples:
- Dell XPS 8930 SE
- Apple iMac 5K
- Dell G5 Gaming Desktop
- HP Omen Obelisk
- Adamant Professional PC

Make sure that students can justify their choices with reasoning.

3 Do research to find out if any company or organisation in your country uses a mainframe computer in the day-to-day running of its operation. For the named organisation or company, describe the purpose for which it uses the mainframe computer.

Students' research will vary but, for example, Allstate (an insurance company), uses a mainframe computer. Insurance companies collect a lot of data to help them assess risk. A mainframe can handle bulk data processing for critical applications, industry and consumer statistics, resource planning and transaction processing to suit their needs.

Crossword



Across

2 Very large, powerful computers (9)

3 A computer that looks like a notebook computer except that users enter data with a keyboard, touchscreen or a digitising tablet (6)

5 A small, light, low-power notebook computer that has less processing power than a full-sized laptop (7)

Down

1 A type of computer that works by using qubits (7)

4 A portable version of a personal computer (6)

5 A computer that can be tucked easily into a briefcase or backpack, or simply under your arm (8)

Questions and answers 3

Fill in the blanks

1 All the input, output and storage devices connected to and dependent on a computer for operation are called **peripherals**.

2 **Input** devices are pieces of equipment that are used to put data into a computer.

3 The first stage of getting data into a computer is known as **data capture**.

4 Documents on which data is first recorded before it is entered into a computer are known as **source** documents.

5 An **ergonomics** keyboard is designed for comfort and usability.

True or False?

1 Input devices are pieces of equipment that are used to put data into the computer. **True**

2 Data can only be entered manually into a computer. **False**

3 Source documents are documents that are output by the computer. **False**

4 A joystick can be used mainly for computer games such as flight simulators. **True**

5 Drawings and sketches can be entered easily onto the computer using the digitising tablet. **True**

6 An OCR reader can only read typed documents. **False**

7 A stylus is a pen-like pointing device for a graphics/digitising tablet. **True**

8 OMR readers are used for assessing multiple-choice examinations or questionnaires given out by market researchers. **True**

9 A sound card is used to digitise sound information into a form that the computer can understand. **True**

10 Passwords and personal identification numbers are more reliable than biometric systems for maintaining security. **False**

Multiple-choice questions

1 Which of the following is NOT an example of a pointing device?

a Touchscreen **b** Trackball

c Touchpad **d** Pointing stick

2 Which of these is used in banks to read cheques?

a OMR **b** OCR

c MICR **d** Barcodes

3 Which of the following can be used in a library to hold information about books?

a OMR **b** OCR

c MICR **d Barcodes**

4 Body and facial movements are used in:

a voice input. **b** touch input.

c motion input. **d** OCR.

5 All of these are special-function keyboards except:

a QWERTY. **b** Braille.

c eye-controlled. **d** concept.

6 Which of the following is an input device that is used mainly for computer games such as flight simulators?

a Joystick **b** Keyboard

c Mouse **d** Stylus

7 Which of these input devices is used to translate drawings, photos and even text into digital form?

a MICR **b** OCR

c Scanner **d** OMR

Short-answer questions

1 **a** Why do computers need input devices?

b Give THREE examples of manual input devices.

a Input devices are used to input data that the computer will process and/or store.

b Examples of manual input devices are: keyboard, mouse, touchscreen, light pen, graphics table and voice input devices. (Any three)

2 Explain each of the following terms:

a Peripherals

b Data capture

c Source document

a **Peripherals** are the hardware that is attached to a computer, for example, keyboard, printer, speakers, mouse and hard drives.

b **Data capture** is the first stage of entering data into a computer.

c A **source document** is a document on which data is first recorded before it is entered into the computer.

3 **a** Give TWO examples of applications where data is captured directly from the source.

b What happens to the data after it has been captured at the source?

a Two examples of applications where data is captured directly from the source:
- barcodes
- lottery slips.

b After the data has been captured at the source it is entered directly into the computer.

4 Which type of keyboard could be used by:

a a blind person?

b a person who is not able to use their hands or feet?

c a cashier at a restaurant?

d a person playing computer games?

a A blind person could use a Braille keyboard.

b A person who is not able to use their hands or feet could use an eye-controlled keyboard.

c A cashier at a restaurant could use a concept keyboard.

d A person playing computer games could use an alphanumeric keyboard.

5 **a** What is a computer 'pointing device'?

b Give an example of a pointing device.

c Which type of operating system allows for the use of pointing devices?

d Name THREE input devices that can be used to point on the computer screen, and explain why different pointing devices are needed.

a A computer **pointing device** is used by graphical operating systems such as Windows to show the motion of a pointer, or cursor, and enable the control and selection of objects on the screen.

b An example of a pointing device is a mouse.

c Windows is an operating system that allows for the use of pointing devices.

d Three input devices that can be used to point on the computer screen are: a light pen, a touch-sensitive screen and a stylus.

The reason why these different pointing devices are needed is to show the motion of a pointer, or cursor, and enable the control and selection of objects on the screen.

6 **a** Give THREE examples of a mouse and its purpose.

b Explain the differences in the way each mouse operates.

a Besides the regular mouse, there are others such as the:

- **optical mouse**, which slides easily over surfaces
- **trackball mouse** for easy selection of figures on the screen
- **pointing stick mouse**, which is a way to control a laptop and is an alternative to an optical mouse or a trackball mouse
- **touchpad mouse**, which is the flat pad on a laptop for moving the cursor
- **eye-controlled mouse**, which is for people with disabilities.

(Any three)

b Students need only explain the differences for the three types of mouse that they chose.

- The **optical mouse** can slide over most surfaces, as it does not have a ball. A small beam of red light bounces off the surface into a sensor. The sensor sends coordinates to the computer, which move the pointer/cursor on the monitor or screen. A mouse can be wired (attached to the computer by a USB cable) or wireless (connected by radiofrequency (RF) technology).
- The **trackball mouse** has a large ball on top rather than under it. You roll the ball with the palm of your hand or fingers. Some laptops have a built-in trackball mouse, with buttons placed close by to allow you to select features on the screen.
- The **pointing stick mouse** is found on laptops and looks like a pencil eraser. It sticks out on the keyboard between the 'B', 'G' and 'H' keys. Pushing on the pointing stick with your finger moves the pointer/cursor around the screen. Buttons placed close by allow you to select features on the screen.
- The **touchpad mouse** is found on laptops, containing a touch-sensitive pad with a pressure and motion sensitive flat surface of about 5 cm × 5 cm. You move your fingers over the surface to control the pointer/cursor on the screen. Feature-selection buttons are placed close by.
- The **eye-controlled mouse** allows people with disabilities to use computers with the help of eye movements while wearing glasses or special equipment. The person looks at a selected icon and blinks once to select the command.

7 Use an example to explain how to use each of the following devices.

a Joystick **b** Digitising tablet

c Touch-sensitive screen **d** Light pen

a A **joystick**, used mainly for computer games such as flight simulators, is a device that allows you to control the movement of an object on a screen by moving a small lever.

b A **digitising tablet** is a board that can sense the position of a pointing device. It allows you to enter drawings and sketches easily onto a computer.

c A **touch-sensitive screen** such as that used at an ATM at a bank, allows you to perform actions on your bank account by following instructions and options on-screen, using your finger to choose each option.

d A **light pen** is connected to a monitor or screen and allows you to point and make accurate selections on a screen. Light pens also allow the user to draw directly on the screen. However, they are not as accurate as a digitising tablet and drawing can become uncomfortable.

8 State an application where each of the following devices can be used:

Device	Application
Plotter	Architectural drawings, graphics
Biometric systems	Law enforcement, high-security systems
Automatic data input	Barcodes, lottery slips
Smart card	ATM
Game controller	PC games

9 **a** Match the number of each device with the letter for its function.

b Give an example of where each device in 1–6 in the table above can be used.

	Input device		Function
1	Scanner	A	A board that can detect the position of a pointing device such as a stylus on its surface
2	Digitising tablet	B	Reading codes with name and price information
3	OMR	C	Mainly used in the banking industry to read data on cheques
4	MICR	D	Translates drawings, photos and even text into digital form
5	OCR	E	Detects the position of dark patches on a sheet of paper
6	Barcode reader	F	Software that scans documents containing texts and converts them into documents that can be easily edited, stored or searched

b **1** A scanner can, for example, be used in a secretary's office.

2 A digitising table can, for example, be used in architecture.

3 An optical mark reader (OMR) can, for example, be used at an exam marking centre.

4 Magnetic ink character recognition (MICR) can be used at a bank to read data on cheques.

5 Optical character recognition (OCR) can be used in the postal service. It automates the reading of addresses on letters and packages and sorting of these at very high speeds.

6 A barcode reader can be used at an airport to read a plane ticket, to read the price on a supermarket item or to read the numbers on a lottery ticket.

10 Explain the differences between each of the following:

a An optical mouse and a trackball mouse

b OMR and OCR

c A flat-bed scanner and a drum scanner

a The **optical mouse** can slide over most surfaces, as it does not have a ball. A small beam of red light bounces off the surface into a sensor. The sensor sends coordinates to the computer, which move the pointer/cursor on the monitor or screen. A mouse can be wired (attached to the computer by a USB cable) or wireless (connected by radiofrequency (RF) technology).

The **trackball mouse** has a large ball on top rather than under it. You roll the ball with the palm of your hand or fingers. Some laptops have a built-in trackball mouse, with buttons placed close by to allow you to select features on the screen.

b **OMR**, or optical mark reading, is used for collecting data, for example, for assessing multiple-choice questions, market research surveys, censuses, voting and lotteries. OMR readers identify the position of dark patches on a form or ticket. The documents to be read have pre-printed empty boxes on them. The user makes pencil or ink marks in certain boxes. The strength of the reflected light from the marks on the form is detected by OMR (also called mark sensing). The computer records the position of the marks and analyses them to work out the meaning of the data.

OCR (optical character recognition) technology is software that can convert different formats of documents containing written text (printed, typed or handwritten) into documents that can be edited, stored or searched easily.

An OCR reader has an optical scanner for reading the text. The shape of different characters is identified by shining a light on them from a photoelectric device, and sensing the patterns of reflected light. The reader looks at each pattern individually. Sophisticated software allows each pattern to be compared with a set of stored patterns until the closest match is found. This match is translated into electronic text in the computer, so that it can be manipulated by the user.

c **Flat-bed scanners** are used by placing a picture or document on the flat surface of the scanner. The scanner captures the image similar to the way a photocopying machine works. Household scanners are relatively inexpensive.

Drum scanners are normally used in the publishing industry (books and magazines, for example) to capture images with high detail. Drum scanners tend to be expensive, costing thousands of US dollars.

Research questions

1 Use the internet to conduct research, then complete the following:

a Define 'motion input'.

b Name THREE disciplines in which motion input can be used.

c For ONE of the named disciplines, explain the purpose for which it is used.

a Students' answers will vary. For example:

Motion input is what a device recognises and reduces to raw data, which a receiver can understand/when a device recognises gestures or movement in a controlled environment.

b Students' answers will vary.

Three examples of disciplines in which motion input can be used:

- a hand-held device such as a gaming system
- infra-red sensors
- CCTV security cameras.

(Accept other sensible answers.)

c Students' answers will vary.

Three examples of disciplines in which motion input can be used:

- a hand-held device such as a gaming system for playing games on a computer
- infra-red sensors for weapons control
- CCTV security cameras for facial recognition.

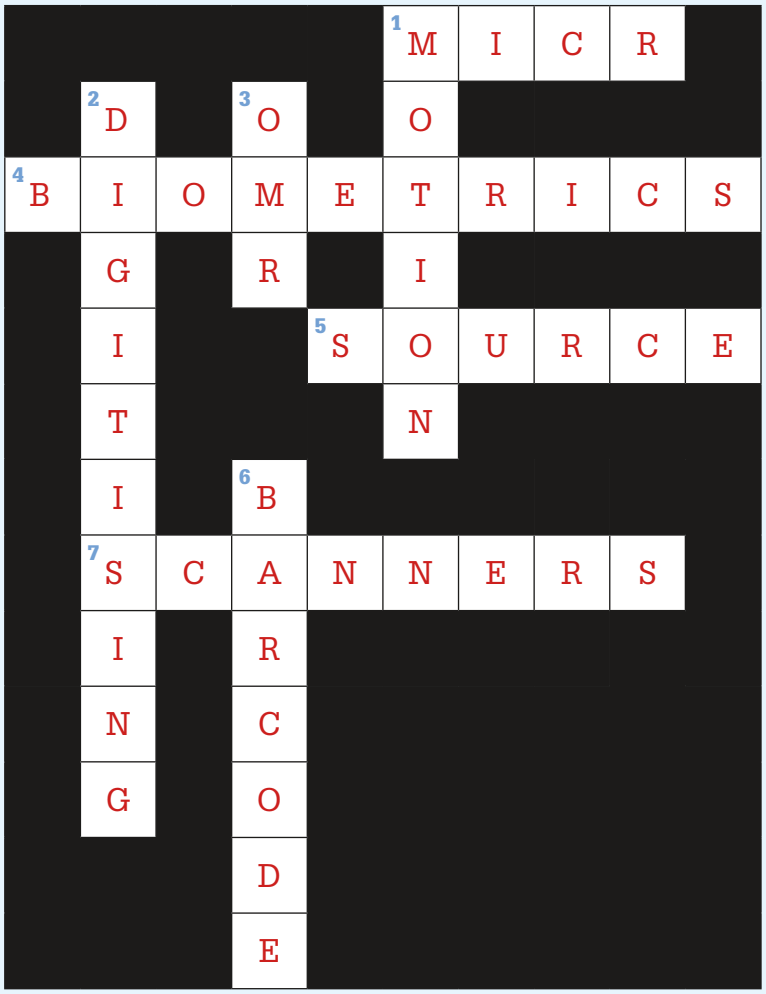
(Any one. Accept any other sensible answers.)

2 You are the manager at a new supermarket. You wish to hire a person who is differently-abled to assist with clerical work. Using your choice of disability that the person may have, give an example of the office job that you could hire this individual to perform and the type(s) of device(s) that you may need to provide to enable the person to perform the job well.

Students' answers will vary. Accept the following ideas and any other sensible answers. Make sure students have written about the disability, an example of the office job that they could hire the individual to perform and the devices that may need to be provided for the individual to be able to do the job well.

Technology aids include colour-coded keyboards, refreshable Braille displays, specialised screen reader software, assistive listening devices, speech recognition and sign language apps, and browsers that provide user-friendly and customisable Web interface.

Crossword



Across

1 Used mainly in the banking industry to read data on cheques (4)

4 Refers to the automatic identification of a person based on his or her individual body characteristics (10)

5 Documents on which data is first recorded (6)

7 Use laser beams and reflected light to translate drawings, photos and even text into digital form (8)

Down

1 A type of sensing device that can translate a player's gestures and facial movement into input (6)

2 A tablet that enables you to enter drawings and sketches into a computer (10)

3 Used for assessing the answers given to questions in multiple-choice examinations (3)

6 Made up of columns of thick and thin lines at the bottom of which a string of numbers is printed (7)

Questions and answers 4

Fill in the blanks

1 **Output** devices are used to get information or any other response out of a computer.

2 Output that cannot be read by humans is said to be **machine** readable.

3 **Softcopy** output or temporary output refers to information displayed on a screen.

4 **Hardcopy** output or permanent output refers to output printed onto paper.

5 A **pixel** is the smallest unit on the screen that can be turned on and off or coloured in different shades.

True or False?

1 Output stored on a storage device is an example of machine readable output. **True**

2 A barcode is an example of human readable output. **False**

3 Information displayed on a screen or in audio or voice form through speakers is referred to as hardcopy output. **False**

4 The more pixels there are on a screen, the higher the resolution. **True**

5 VRS systems can operate standard household activities, such as turning lights and fans on and off, or closing and opening a garage door. **False**

Multiple-choice questions

1 Which of the following is an example of human readable output?

a Barcode
b **Output on a computer screen**
c Output stored on a storage device
d Magnetic ink characters

2 Which of the following software applications may require a screen with high resolution?

a Word processor
b **Gaming software**
c Spreadsheet
d Database

3 Which of the following printers would allow a user to print a multi-layered form?

a Laser
b Thermal
c **Dot matrix**
d Inkjet

4 Which of the following printers is an impact printer?

a Laser
b Thermal
c **Line**
d Inkjet

5 Plotters are useful for producing:

a charts.
b maps.
c building plans.
d **all of these**

Short-answer questions

1 Use examples to explain the difference between:

a machine readable and human readable.

b softcopy and hardcopy.

a If we cannot read the output, such as barcodes or output on storage devices, we say that the output is **machine readable**.

If we can read the output, such as on a computer screen or printed on paper, we say that the output is **human readable**.

b Softcopy, or temporary, output is information that is displayed on a screen, or in audio or voice form through speakers. Softcopy output disappears when you switch off the computer. Hardcopy or permanent output is information that is printed on paper.

2 THREE terms associated with the quality of an image are 'pixel', 'resolution' and 'graphics card'.

a Define the term 'pixel'.

b Explain the term 'resolution'.

c Give TWO examples of applications that might require high resolution.

d Explain the function of a graphics card.

a A **pixel** (short for 'picture element') is the smallest unit on the screen that can be turned on or off, or coloured in different shades.

b **Resolution** is the clarity or sharpness of an image when displayed on the screen. The more pixels, the greater the level of detail that can be shown in an image, and the higher the resolution. If the resolution is low, images are displayed with jagged edges.

c Two examples of applications that might require high resolution are:

- software such as computer-aided design (CAD) packages, which require high resolution so that the designs can be viewed and worked on in detail
- most gaming software, which requires high resolution.

d A video **graphics card**, also called a video display adapter, is a circuit board installed in most computing devices, which displays graphical data with high clarity, colour, definition and overall appearance. The quality of the graphics card will determine the clarity of the images produced. Most gamers use high-end graphics cards or may install an extra graphics card in their system to improve the quality of the images in their games.

3 A voice response system (VRS) is an interface that responds to voice commands.

a Explain how a VRS works and give ONE example of an application of a VRS in the home.

b Give ONE example of how a person who is differently-abled may use such as system.

c Explain the difference between a VRS and a speech-generating device (SGD).

a A voice response system (VRS) works by being able to interpret commands. The system selects from a set of digitised pre-recorded words, phrases, music, alarms or other sounds stored on hard disk. The system combines these pre-recorded words into responses based on selections made by the user. For example, many phone banking systems use voice response systems. Based on the information given when a caller selects options on their telephone keypad, the bank computer outputs voice information to the caller.

At present, VRS systems are also available to operate standard household activities, such as turning lights and fans on and off, or closing and opening a garage door.

b Visually-impaired or other physically-impaired people who may be unable to use a mouse or keyboard can use a VRS to instruct the computer to carry out various tasks.

c A **voice response system (VRS)** is an interface that responds to voice commands, whereas a **speech-generating device (SGD)**, is an electronic output device that is used to help individuals with severe speech impairments or other problems that make it difficult to communicate. Although SGDs vary in their design, most consist of several pages of words or symbols that a user may choose from a touchscreen. As the person makes choices, suggestions are made for the next symbol or word, based on what he or she might want to say. Most SGDs can produce electronic voice output by utilising either speech synthesis or via a digital recording of someone speaking.

4 Match the device with the individual most likely to use the device.

	Device
1	Touchscreen
2	Headset
3	3D printer
4	Plotter
5	Multimedia projector

	Individual most likely to use the device
A	Teacher
B	Architect
C	Cashier at a restaurant
D	Dental technician
E	Gamer

Research questions

1 You visit a hardware shop and observe that when a customer makes a purchase, a three-layered receipt is generated: one sheet for the customer, one sheet for the cashier and one sheet for the stores department. The shop manager explains that he has to prepare high-quality documents to send to different companies and government offices. The manager added that they use different types of printers for each task, but was unable to give further details.

a Conduct research to determine which TWO types of printers would meet their needs.

b Justify your choice of printers.

c Create a table to show the types of printers required for each activity outlined above; giving THREE names of the two types of printers required.

d For each printer, state the approximate cost, printing speed, manufacturer and model.

Students' research will vary. Here are some examples.

a The two types of printers that the hardware shop will need are:
- a dot matrix printer
- an inkjet printer.

b Justification for the example choices:
- A dot matrix printer does not print on the best-quality paper but it is suitable for printing multiple copies, as needed by the customer, cashier and shop's stores department.
- An inkjet printer is fast and is generally a good choice for printing high-quality documents.

c Students' tables will vary. Check that students have chosen the correct types of printers, as per their answers to questions 1 and 2, for example, if they chose dot matrix and inkjet printers, make sure that they found models that could in fact be chosen for each need. Encourage students to keep references about each site they visit.

d Students' approximate cost, printing speed, manufacturer and model names will vary. Encourage students to keep references about each site they visit.

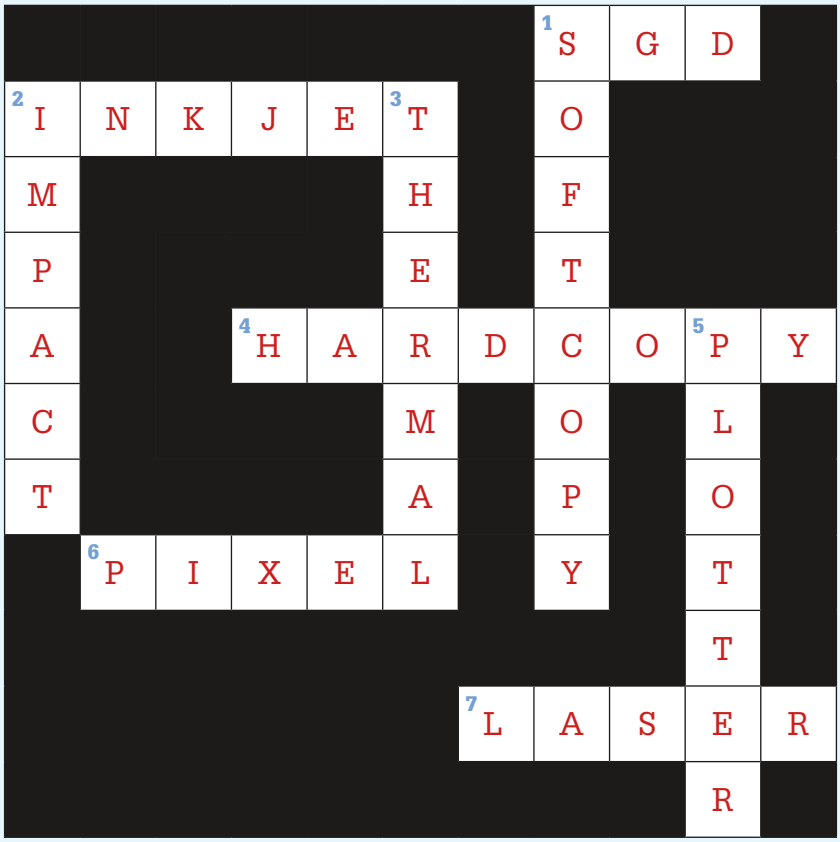
2 A home for people who are differently-abled have approached you to make recommendations on the type of output devices that people with disabilities could use to help them to lead more productive lives. Conduct research and complete the following table for at least TWO disabilities.

Name of device	Supplier/ brand	Type of disability	How is it used	Approximate cost

Students' research will vary. Check that they complete the table correctly. Examples of devices for people with certain disabilities are as listed.

- Blindness: screen reader software, text-to-speech software, Braille keyboard, voice recognition, voice input devices.
- Physical disability: joystick, eye-controlled keyboard, concept keyboard, eye-controlled mouse, voice data entry.

Crossword



Across

1 An electronic output device, used to help individuals with severe speech impairments (3)

2 A type of printer that produces output by spraying small, electrically-charged droplets of ink from four nozzles through holes in a matrix, at high speed onto paper (6)

4 Output that is permanent and is usually printed (8)

6 The smallest unit on the screen that can be turned on or off, or coloured in different shades (5)

7 A type of printer that uses similar principles to photocopying for printing (5)

Down

1 Output that is temporary and disappears when the computer is switched off (8)

2 A printer that produces output when the print head that contains a number of metal hammers strikes an inked ribbon (6)

3 A type of printer that is used in cash registers, barcode systems, label makers and calculators (7)

5 Specialised output device designed to produce high-quality graphics in a variety of colours (7)

Questions and answers 5

Fill in the blanks

1 **Random access** memory is another name for primary storage, also called main memory or Immediate Access Store (IMAS).

2 The **central processing** unit can only act on data and instructions that are held in primary storage.

3 A memory chip is an integrated circuit (IC) made of millions of **transistors** and capacitors.

4 **RAM** is available immediately to the processor and holds data and instructions (programs) temporarily while processing takes place.

5 **ROM** chips hold data and instructions necessary for starting up the computer when it is switched on.

True or False?

1 All computers need to store and retrieve data for processing. **True**

2 A magnetic disk is an example of primary storage. **False**

3 Main memory is made up of RAM and ROM chips. **True**

4 RAM memory is volatile. **True**

5 RAM memory is only filled after a computer has been turned on. **True**

Multiple-choice questions

1 Primary storage is also referred to as:

a backup storage.
b secondary storage.
c auxiliary storage.
d immediate access storage.

2 Primary storage holds:

a programs needed to start up the computer.
b software applications not being processed.
c data and instructions temporarily while processing takes place.
d none of the above.

3 RAM is volatile. This means:

a that the data and instructions held in RAM are permanent.
b that if the computer is rebooted, all the data and instructions held in RAM are lost.
c that RAM holds data that can be quickly accessed by the control unit.
d all of the above.

4 A byte consists of:

a 4 bit.
b 6 bit.
c 8 bit.
d 10 bit.

5 A group of 2 bits can represent:

a two values.
b three values.
c four values.
d eight values.

Short-answer questions

1 Using examples, explain the differences between the terms 'primary storage' and 'secondary storage'.

Primary storage, also called main memory or Immediate Access Store (IMAS), is a group of memory chips on the motherboard (main circuit board) of the computer.

Secondary storage, also called auxiliary or backup storage, is used to store data and instructions when they are not being processed or when the power is turned off. Secondary storage is much cheaper than primary storage and is unlimited (you can buy as much as you can afford).

2 Explain why a computer needs both RAM and ROM memory.

Programs and data stored in secondary storage must first be loaded into **RAM** before they can be processed.

Read Only Memory (**ROM**) chips hold the data and instructions that are necessary for starting up the computer when you switch it on. It is commonly used to store system-level programs such as the BIOS (Basic Input/Output System) program. ROM chips may also hold translators for high-level languages and operating systems.

3 **a** How many bit patterns can be represented by 3 bits?

b Write out the bits patterns that can be represented by 3 bits.

a We can represent 3 bits by 8 bit patterns.

b

000	0	100	4
001	1	101	5
010	2	110	6
011	3	111	7

4 Convert the following binary numbers to decimal (base 10) numbers.

a 1100 **b** 1001

c 1111

a 12 **b** 9 **c** 15

5 Convert the following decimal numbers to binary.

a 25 **b** 205

c 255

a 11001_2 **b** $11001\ 101_2$ **c** 11111111_2

6 Convert the following decimal numbers to hexadecimal.

a 45 **b** 276

c 3871

a 2D **b** 114 **c** F1F

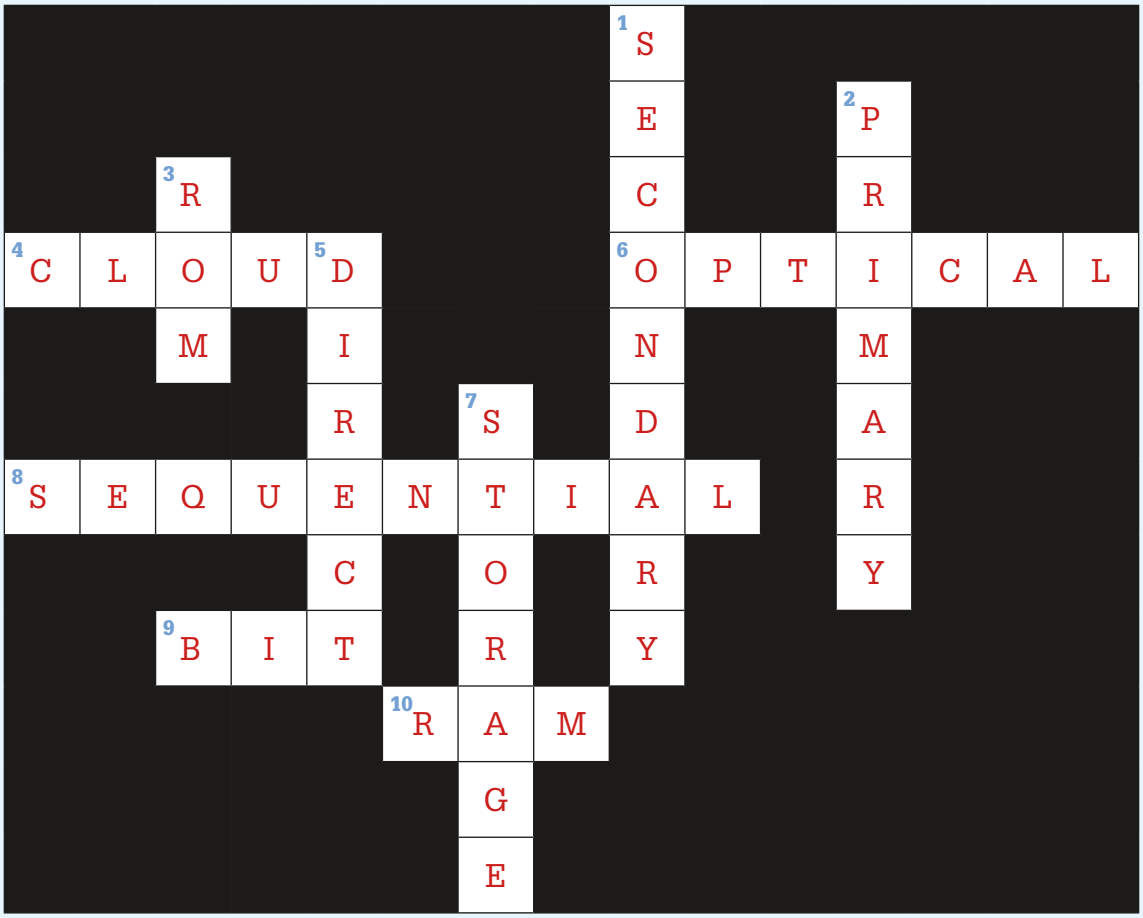
Research question

Use the internet to conduct research and complete the following question.

There are different devices that can be used for secondary storage. Copy and complete the table below for THREE products for each category that are currently being sold.

Storage media	Name of the device (brand, etc.)	Storage capacity	Average cost per MB	Application (where it can be used)
Magnetic tape	Master Magnetics	185 TB	$0.02	Video or computer data storage
Magnetic disk	Britannica	100Gb–1TB	$0.02	Data storage
Flash memory	SanDisk	16Gb–256Gb	$0.05	Data storage

Crossword



Across

4 A type of online storage (5)

6 A type of disc that is read by laser lights (7)

8 A type of access where data is accessed in the order in which it was stored (10)

9 The smallest unit of storage (3)

10 Holds processed data that is waiting to be output or stored in a secondary storage device (3)

Down

1 A type of storage device that stores data and instructions permanently, to be used when required (9)

2 Memory that consists of RAM and ROM (7)

3 A chip that is non-volatile (3)

5 A type of access where you can go directly to a specific piece of data without having to access any other data (6)

7 Refers to the media and devices used to keep data and instructions for immediate or later use (7)

Questions and answers 6

Fill in the blanks

1 The general name given to all the programs that computers use to perform different tasks is **software**.

2 **Application software** are programs developed to carry out specific tasks or to solve particular problems.

3 An **integrated** software package is a set of related programs combined in a unified package that allows data to be transferred easily between the programs.

4 Software that is written for a specific task rather than for a broad application area is known as **specialised**.

5 General-purpose software that has been modified to better meet the needs of an individual or organisation is known as **customised** software.

True or False?

1 General-purpose software is software that is not written for any specific business or organisation. **True**

2 An electronic encyclopaedia is an example of integrated software. **False**

3 A payroll program that deals with all aspects of a company's payroll is an example of specialised software. **True**

4 Custom-written software is software that is written to meet the specific needs of a company. **True**

5 System software enables the running of application software and the management of the system resources. **True**

Multiple-choice questions

1 Which of these is an example of application software?

a Language translator
b Operating system
c **Spreadsheet software**
d Utility program

2 Which of these is system software?

a Word processing software
b **Device drivers**
c Entertainment software
d Simulation software

3 A file name usually consists of two parts – the name and the extension, separated by a dot. Which is an example of a graphic file extension?

a DOC
b TXT
c SYS
d **JPEG**

4 Which of the following is a service performed by a utility program?

a **Virus protection**
b Boot up the computer
c Interact with hardware devices
d Language translator

5 Utility programs are an example of:

a **system software programs.**
b application software programs.
c graphic programs.
d productivity software.

Short-answer questions

1 With the use of examples, explain the difference between application software and system software.

Application software programs are packages that carry out specific tasks or solve particular problems.

System software manages and supports the resources and operations of a computer system and include the operating system (OS) and utility programs.

2 **a** Define the term 'operating system (OS)'.

b Give TWO functions of the OS.

c Name ONE example of OS software used by personal computers.

a An **operating system (OS)** is a set of programs that governs the operation of a computer. It manages computer resources, files, memory, tasks and maintains security.

b Examples of functions of the OS:

- managing resources
- managing files and resources
- maintaining security
- managing tasks
- providing a user interface.

(Any two)

c MSDOS, Windows 3.X, Windows 95, Windows 98, Windows ME (Millennium Edition), Windows 2000, Windows XP, Windows Vista and Windows NT. (Any one of the abovementioned)

3 A command user interface requires you to enter a command by typing in codes or words.

a Name TWO other types of user interfaces.

b Explain how each of the named user interfaces functions.

a Other types of user interfaces are: command driven, menu driven, graphical user, and touch.

b Each of the named user interfaces functions as described here.

Command-driven interface

The command-driven interface is used in PCs that either operate exclusively with the MSDOS operating system (OS), or in PCs that are currently in MSDOS mode rather than Windows mode. This interface requires you to enter a command by typing in codes or words. You have to type the command at the prompt on the display screen. For example, at the C:\> prompt, where C:\ generally refers to the hard disk, you can type the following command: C:\>delete *.* This command tells the OS to erase all the files on the hard disk.

Menu-driven interface

A menu-driven interface allows you to use either a mouse or cursor movement (using the arrow keys) to select from a menu. Menus contain commands to 'Print', 'Save', 'Send to' and so on. Menus are easier to use than command-driven interfaces because you do not have to remember commands. You simply select from the lists provided.

Graphical user interface

The graphical user interface (GUI) (pronounced 'goo-ee'), also called WIMP (windows, icons, menus and pointing devices), is the easiest interface to use when interacting with the CPU. It allows you to use graphics (images), menus and keystrokes to choose commands, start programs, see lists of files and other options. Some images take the form of icons. Icons are small symbols or figures that represent programs, procedures, folders, files, tasks and so on. Another feature of the GUI is the use of windows. A window is a rectangular boxed area on a computer screen. Note: Do not confuse this with Windows, for example, Windows 10, with a capital W, which is the Microsoft operating system. The screen can show different windows with individual application programs running at the same time, such as, a word processing document in one window and a spreadsheet in another. Or, two windows may show two different documents being run by the same program. A window can also show other things, such as a directory of files on your hard drive. The windows appear over a common background known as the desktop.

Touch user interface (TUI)

Touchscreen devices are found all over, such as on smartphones, in retail stores and restaurants, and in cars, residential homes and at workplaces. Touchscreens allow users to control a device or machine through a touchbased user interface. A touch user interface (TUI) is computer-pointing technology that is based on the sense of touch. It is a graphical user interface using a touchpad or touchscreen display as a combined input and output device. It gives users, especially people with visual impairments, an added level of communication, based on touch or Braille input.

(Students should explain how the two interfaces they chose function.)

4 The ABC Bauxite company has bought a software package containing several applications to be used for different tasks within the company.

a State the name of the type of package bought by the company.

b Name ONE example of this type of package.

c Give TWO advantages and ONE disadvantage of buying this type of software.

a The company bought an integrated software package.

b An example of an integrated software package is Microsoft Office.

c Advantages of an integrated software package:

- It takes up less disk space than individual applications.
- You can move much faster from one application to the next.
- It is usually easier to learn, as the user interface for choosing commands is the same.

- It tends to be more powerful and versatile than individual applications.
- It is less likely to crash and contains fewer errors, since it has been widely tried and tested.
- The producers' after-sales service is often good (such as online help facilities); users can also get support from user groups and magazines.
- It is usually cheaper than purchasing each package separately.

(Any two)

Disadvantages of an integrated software package:

- Not all the features of single applications are included.
- Some integrated packages do not contain all the applications that may be required to complete a task.
- The software may not be suited for use with other well-known software packages.
- The software package may not be unsuited for use by professionals.

(Any one)

Research question

1 You are an analyst, working for a small manufacturing company in Jamaica. The company has 200 desktop computers that run the Windows 7 operating system (OS). This year the company plans to upgrade the OSs of all the desktop computer to Windows 10. You are asked to complete the following:

a How much would it cost to upgrade ONE computer?

b What are the memory and storage requirements of Windows 10?

c Will the existing system be able to run the OS or will new systems be required?

d Which of the TWO OSs is best at protecting against malware?

e What new features are included in Windows 10 that are not available in Windows 7?

Students' research will vary. Here are some example answers.

a The cost of upgrading one computer would be in the region of $600 and $1,000 per desktop.

b The memory and storage requiremeents of Windows 10 are: 1 gigabyte (GB) RAM would be needed for 32-bit or 2 GB RAM for 64-bit.

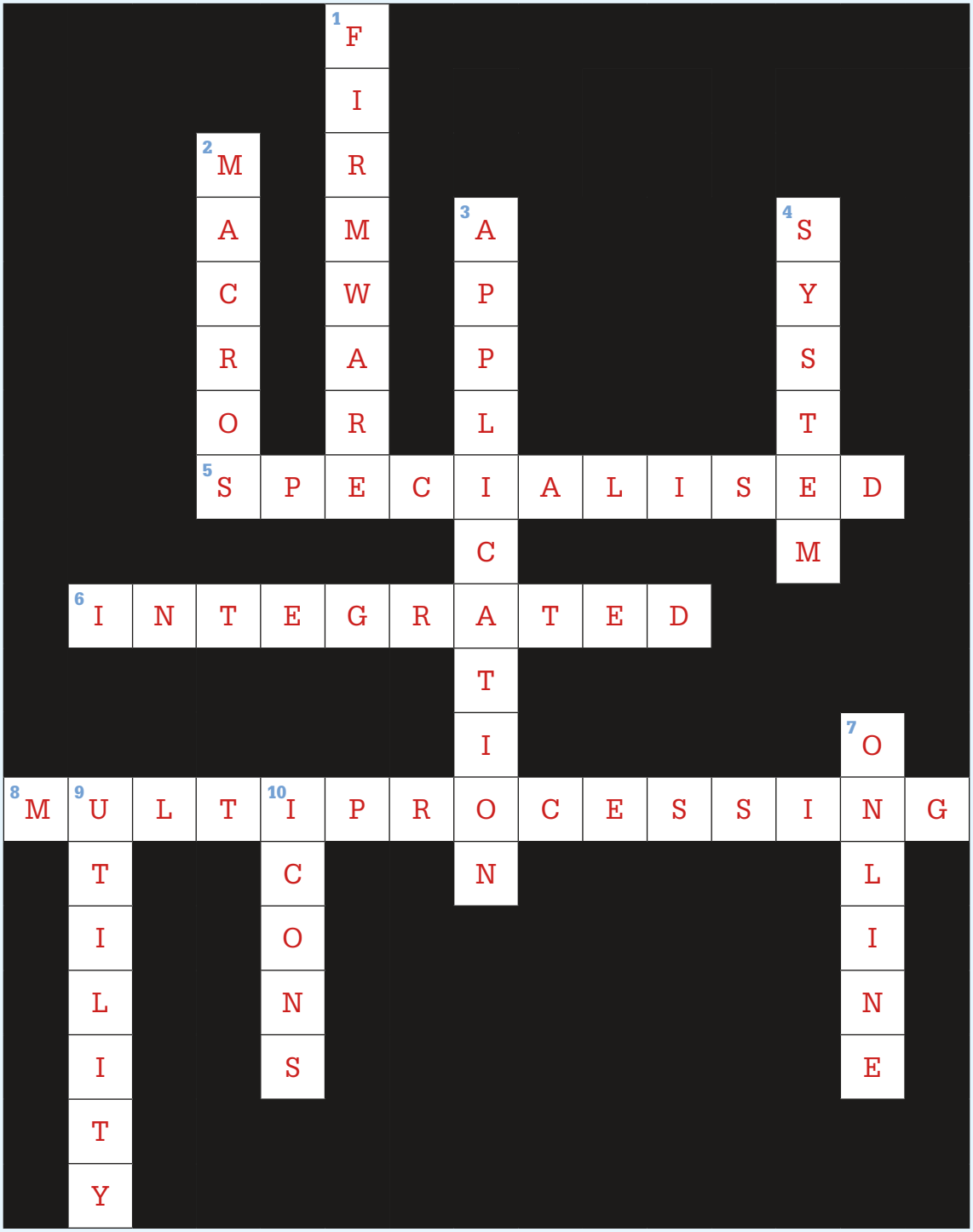
Hard disk space: 16 GB for 32-bit OS or 20 GB for 64-bit OS

c Students' answers will vary here. Some students might say that they are unable to answer this question as the current specs are not given.

d The Windows 10 operating system is best at protecting against malware.

e The new features that are included in Windows 10 but are not available in Windows 7 are: quick toggle switches for screen brightness, sharing files, network settings and the addition of Cortana, a virtual or personal productivity assistant.

Crossword



Across

5 Software that is written for a specific task rather than for a broad application area (11)

6 Software that contains a set of related programs combined in a unified package that allows data to be transferred easily between the programs (10)

8 An OS that enables several program to run at the same time (15)

Down

1 Consists of ROM chips or flash memory chips that store instructions permanently (8)

2 Short programs written to automate several steps in software such as databases, spreadsheets and word processors (6)

3 Software developed to carry out specific tasks or solve particular problems (11)

4 Software that manages and supports the resources and operations of a computer (6)

7 A type of system where the terminals and the computer are linked interactively (6)

9 Programs that provide useful services, such as performing common tasks and 'housekeeping' routines (7)

10 Small pictorial figures that represent, for example, programs, folder, files, tasks and procedures (5)

Questions and answers 7

Fill in the blanks

1 An inflamed tendon caused by some repeated motion or stress on that tendon is known as **tendonitis**.

2 **Carpal** tunnel syndrome is an inflammation of the nerve that connects your forearm to the palm of your hand.

3 Repetition, bad posture and **lack of rest** are three key factors that result in repetitive strain injury.

4 **Ergonomics** is a science that makes extensive use of mathematics, physics and biomechanics to determine the best working conditions for humans who work with machines.

5 **Neck** strain can be caused by keeping your head bent and looking down at your laptop for long periods of time.

True or False?

1 Carpal tunnel syndrome is an inflammation of the nerve that connects your forearm to the palm of your hand. **True**

2 Bad posture is the main cause of RSI. **False**

3 One symptom of tendonitis of the wrist is a very mild pain that extends from the forearm to the hand. **False**

4 Taking frequent breaks during any long computer session to exercise your hands and arms can prevent strain injury. **True**

5 Reducing glare and reflections from the computer screen can reduce computer vision syndrome. **True**

6 Spending too much time with headphones on, listening to loud music or other audio material, can cause tinnitus (ringing in the ears). **True**

7 Research has found no link between certain mental illnesses and internet addiction. **False**

8 Reduction in the construction of buildings is a negative effect on the use of computers. **False**

9 The heavy metals contained in computers can cause serious illnesses to humans. **True**

10 Headaches or a sore neck can be as a result of computer vision syndrome. **True**

Multiple-choice questions

1 Which of these is a type of repetitive strain injury?

a Short-sightedness
b **Tendonitis**
c Lower back pain
d None of these

2 All of the following are symptoms of computer vision syndrome, except:

a sore, tired, burning, itching or dry eyes.
b blurred or double vision.
c headache or sore neck.
d **extreme pain in the forearm.**

3 Which of the following types of workers is most prone to repetitive strain injury?

a **Musician**
b Engineer
c Doctor
d Teacher

4 Lower back pain due to extended computer use may be reduced or eliminated by:

a using a firm, adjustable and comfortable chair.
b stretching your lower back now and then by standing up and pulling each knee to your chest, holding that position for a few seconds.
c relaxing your shoulders.
d **all of the above.**

5 Which of these may be caused by internet addiction?

a **Depression**
b Common cold
c Rash
d Pimples

Short-answer questions

1 **a** Name TWO types of repetitive strain injury.

b List THREE key factors that can result in repetitive strain injury.

c Describe THREE methods that can be used to prevent or reduce repetitive strain injury.

a Two types of repetitive strain injury are:

- tendonitis – where a tendon is where a tendon is inflamed, caused by some repeated motion or stress on that tendon
- carpal tunnel syndrome – an inflammation of the nerve that connects your forearm to the palm of your hand.

b Three key factors that can result in repetitive strain injury are:

- repetition – using the keyboard or mouse constantly for long hours
- bad posture – long hours at the computer, sitting incorrectly or in the same position
- lack of rest – long concentrated hours using keyboard.

c Methods that can be used to prevent or reduce repetitive strain injury are:

- Take frequent breaks during any long computer session to exercise your hands and arms.
- Place a wrist rest between the keyboard and your desk edge to prevent injury due to typing. Wrist rests should match the front edge of the keyboard in width, height, slope and curve.
- Position the mouse at the same height as your keyboard.
- Type on the computer keyboard as you would play the piano, lifting your fingers up and down, rather than your wrists.
- Use an adjustable keyboard that allows you to change the positions and angles of the keyboard.
- Place the mouse at least six inches in from the edge of the desk to prevent injury while using the mouse. In this position, your wrist is flat on the desk, which causes bending to occur at the elbow rather than at the wrist.
- When you slide the mouse around, move your entire arm and not just your wrist.
- Use a mouse that matches the curve of your hand and have sufficient cord length to allow its placement next to the keyboard.
- Ensure that armrests are removable and the distance between them should be adjustable. Armrests should be padded and soft.

(Any three)

2 **a** Explain the term 'computer vision syndrome'.

b List FOUR conditions that may result from computer vision syndrome.

c Describe THREE ways in which computer vision syndrome can be reduced or prevented.

a **Computer vision syndrome** (CVS) is the term for problems caused by looking at a computer screen or display device for long periods without a break. This intense focus on the screen or device strains the eye muscles.

b Conditions that may result from computer vision syndrome are:

- sore, tired, burning, itching or dry eyes
- blurred, double vision or difficulty focusing on the screen
- headache or sore neck
- distance vision blurred after prolonged staring at a monitor
- difficulty shifting focus between monitor and documents
- 'colour fringes' or 'after images' when you look away from the monitor
- increased sensitivity to light.

(Any four)

c Ways in which computer vision syndrome can be reduced or prevented:

- Take a break of five to ten minutes away from the computer every hour.
- To reduce glare you could dim the lighting around you, put an antiglare cover or monitor hood over the screen or close the curtain or shades on a nearby window, to block out excessive sunlight or light from other sources.
- Adjust the brightness of the computer screen using the buttons usually at the bottom of your monitor. This will reduce the intensity of the light getting to your eyes and so reduce the possibility of eye strain.
- Prevent eyestrain – the top of your screen needs to be at, or slightly below, eye level; find a comfortable distance between your eyes and the screen (usually 45 to 71 cm).
- Blinking lubricates your eyes with tears and another solution to prevent it from drying out. Blink frequently when starting at the screen.
- Gently massage your eyes, cheeks, forehead, neck and upper back from time to time to keep blood flowing and muscles loose.

(Any three)

3 **a** Describe TWO situations that may result in neck strain due to improper computer use.

b State THREE methods of preventing or reducing neck strain.

a Students are asked to describe situations that may result in neck strain due to improper computer use. Encourage students to think of situations from their everyday life at school or from a workplace with which they may be familiar. Examples are:

- poor posture
- bending over a computer for too long
- not sitting with the computer screen and keyboard at the right height

- when using two (or more) screens that are not positioned correctly for long periods of time, resulting in having to move the head awkwardly.

(Any two)

b Three methods of preventing or reducing neck strain:

- Use lower back support in your work chair to maintain a healthier posture.
- Raise your laptop to eye level by placing something under it. You will need to use an external keyboard to type comfortably in this position.
- Take short breaks to do some simple movements, such as shoulder rolls, while studying or working.

4 **a** State TWO causes of lower back pain due to computer use.

b Describe THREE methods of preventing or reducing lower back pain due to computer use.

a Two causes of lower back pain due to computer use are:

- bad posture
- poorly designed or incorrectly assembled furniture or equipment.

b Three methods of preventing or reducing lower back pain due to computer use:

- Use a firm, adjustable and comfortable chair designed to support your back. Adjust the chair height so that your thighs are horizontal, your feet are flat on the floor and the backs of your knees are slightly higher than the seat of your chair. The back of the chair should support your lower back.
- Stretch your lower back now and then by standing up and pulling each knee to your chest, holding that position for a few seconds.
- Take short breaks.

5 **a** Name THREE types of mental illness associated with internet addiction.

b Describe TWO ways to reduce or prevent mental illnesses associated with internet addiction.

a Three types of mental illness that are associated with internet addiction are:

- depression
- low self-esteem
- loneliness.

b Two ways to reduce or prevent mental illnesses associated with internet addiction:

- Reduce the number of hours spent on the internet.
- Spend time having physical face-to-face conversations.

Research questions

1 Using the internet to conduct research, complete the following:

a List THREE types of jobs, other than those mentioned in this chapter, that can cause employees to suffer from repetitive strain injury (RSI).

b State which type of RSI the employees may suffer from.

c Which profession has the highest rate of RSI?

Students' research will vary. Example answers are provided here.

a Jobs that can cause employees to suffer from RSI:

- typists
- workers on an assembly line
- surgeons
- dentists
- cooks
- drivers
- road maintenance staff
- equestrian athletes
- golfers
- clerks and data entry professionals
- ultrasonographers
- nurses
- tailors
- cleaners
- carpenters
- workers with heavy machinery
- swimmers
- martial artists.

(Any three)

b Type of RSI the employees may suffer from:

- typists – backache, shoulder pain, neck strain, eye strain, carpal tunnel syndrome, tendonitis
- clerks and data entry professionals – eye strain, neck pain, carpal tunnel syndrome, tendonitis
- workers on an assembly line – backache, neck strain, tinnitus
- ultrasonographers – eye strain
- surgeons – shoulder pain
- nurses – backache, shoulder pain, neck strain, eye strain, tendonitis
- dentists – neck strain, eye strain, tinnitus
- tailors – neck strain, eye strain, tendonitis
- cooks – backache, shoulder pain, neck strain, tendonitis
- cleaners – backache, shoulder pain, carpal tunnel syndrome, tendonitis
- drivers – neck strain, eye strain
- carpenters – backache, shoulder pain, neck strain, tendonitis, tinnitus
- road maintenance staff – backache, shoulder pain, tendonitis
- workers with heavy machinery – backache, shoulder pain, neck strain, eye strain, tendonitis, tinnitus
- equestrian athletes – backache, shoulder pain, neck strain
- swimmers – backache, shoulder pain, neck strain
- golfers – backache, shoulder pain, carpal tunnel syndrome, tendonitis
- martial artists – backache, shoulder pain.

(Any three)

c The profession with the highest rate of RSI: Students' choice of profession will vary. Encourage them to provide sound reasoning for their answers.

2 Conduct research to complete the following:

a What devices are currently being manufactured using ergonomic design principles?

b List THREE companies that manufacture ergonomically-designed computer peripherals.

Students' research will vary. Here are some examples:

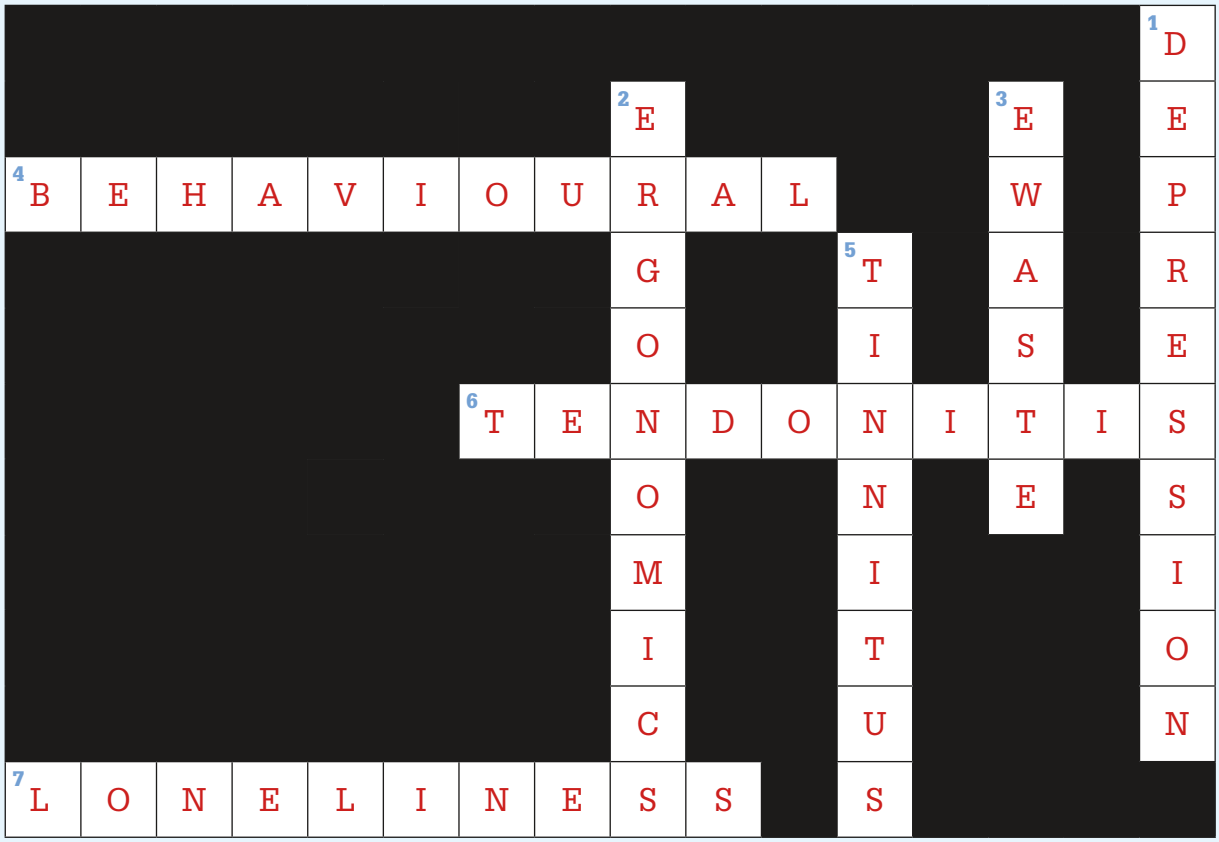
a Devices that are currently being manufactured using ergonomic design principles:

- monitor arms
- keyboard arms
- keyboard trays
- document holders
- chair lumbar support/seat design
- wrist support gloves
- computer monitor glare filter
- workstations
- noise-cancelling microphones.

b Three examples of companies that manufacture ergonomically-designed computer peripherals:

- AC Industries
- RDM Industrial Products Inc.
- AFC Industries, Inc.

Crossword



Across

4 A type of problem that can result from spending long hours on digital technology (11)

6 A medical condition where a tendon is inflamed, caused by some repeated motion or stress on that tendon (10)

7 May be caused by internet addiction (10)

Down

1 This illness may result from the excessive use of digital technology (10)

2 A science that makes extensive use of mathematics, physics and biomechanics to determine the best working conditions for humans who work with machines (10)

3 Another name for 'technological waste' (6)

5 This is caused by spending too much time with headphones on listening to loud music or other audio material (8)

Questions and answers 8

Fill in the blanks

1 **Communication** can be broadly described as the process by which information is transmitted or exchanged.

2 The physical path that connects sender and receiver in a communications system is known as **the channel**.

3 The **encoder** is a device that converts digital signals in a form that can pass through a transmission medium.

4 A data communications system is made up of hardware, software and **communications** facilities.

5 **Bandwidth** determines the volume of data that can be transmitted in a given time.

6 You can send data or receive data, but not both when you use a **half duplex** line.

7 A **network** is a group of two or more computers linked together so that they can share resources and can communicate with one another.

8 A **server** runs the networking software that allows resources to be shared with the other computers on the network.

9 **Wifi** is the most popular means of communicating data wirelessly, within a fixed location.

10 A **WLAN** can be used where it may be difficult or impractical to use a cabled LAN, such as in homes, large offices, warehouses and lecture halls.

True or False?

1 The message to be communicated in a communications system may consist of text, numbers, pictures, sound, video or any combination of these. **True**

2 The encoder is a device that converts the encoded signals into digital form. **True**

3 A narrow band channel can transmit data at the rate of up to 64 Kbps. **False**

4 Data in any communications system is moved from one location to another via data communications channels or links. **True**

5 Each device that forms part of a network must be connected by cables. **False**

6 Wireless communications uses radio frequency transmissions as the means for transmitting data. **True**

7 A switch increases the overall performance of the devices on the network. **True**

8 A router is an interface that enables communication between two different networks. **True**

9 A personal area network can only be wireless. **False**

10 An internal threat is a threat that originates from inside the organisation and commonly occurs due to employee actions or weak access control. **True**

Multiple-choice questions

1 All of the following are components of a simple communications system except:

a sender.
b receiver.
c internet.
d encoder and decoder.

2 Which of the following allows data to flow in both directions?

a Full duplex
b Half duplex
c Simplex
d None of these

3 Which type of network is usually found in schools and businesses located in a small geographical area?

a WAN
b LAN
c MAN
d PAN

4 Which of the following is a benefit of a LAN?

a Hardware such as printers can be shared
b Storage facilities can be shared
c Software and data files can be shared by many users
d All of the above

5 A network that involves a computer, smartphone, printer, and/or other personal device such as a tablet that is set up for personal use is known as?

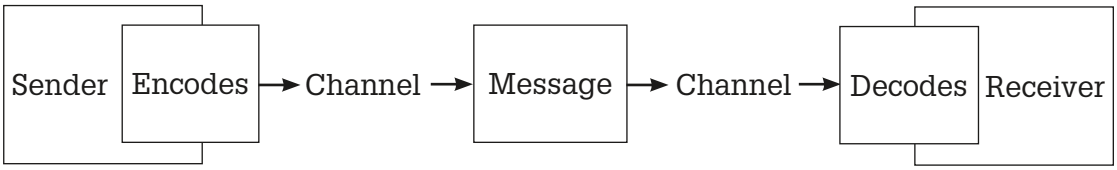
a MAN
b PAN
c LAN
d WAN

Short-answer questions

1 **a** Draw a diagram to show the components of a simple communications system.

b Explain the purpose of each of the components in a simple communications system.

a Diagram to show the components of a simple communications system:



b The purpose of each component in a simple communications system:

Context – Every communication proceeds with a context. The sender chooses the message to communicate within a context, which may be physical, social, chronological or cultural.

Message – The message is the data or information to be communicated. It may consist of text, numbers, pictures, sound, video or any combination of these.

Sender – The sender is a device (for example, a computer, smartphone, fax machine, laptop, notebook, tablet) that sends the message.

Receiver – The receiver is a device that receives a message. The receiver can be a printer, smartphone, fax machine, laptop, notebook or tablet. The receiver must be capable of accepting the message.

Channel (Medium) – The channel is the physical path that connects the sender and receiver. It is used to transmit data. The channel can be wired (twisted pair, coaxial cable or fibre optics cable) or wireless (radio waves, microwaves, infrared, Bluetooth, satellite).

Encoder and decoder – The encoder is a device that converts digital signals in a form that can pass through a transmission medium. The decoder is a device that converts the encoded signals into digital form. The receiver can understand the digital form of the message.

Feedback – Feedback allows the sender to analyse the effectiveness of the message. It helps the sender to confim the correct interpretation of the message by the decoder. Feedback may be verbal or non-verbal.

2 **a** Define the term 'data communications'.

b Explain the term 'bandwidth'.

c For the THREE bandwidth channels available, give their speed and an application.

a **Data communications** refers to the transmission of data from one location to another for direct use or for further processing.

b **Bandwith** is the capacity of a channel to transmit a volume (amount) of data in a given time.

c Speed and an application for the three bandwidth channels available:

- A **narrow-band channel**, which is almost obsolete, for example, a telegraph system, can transmit data at slow speeds of between 10 and 30 bits per second (bps).
- A **voice-band channel** can transmit data at the rate of up to 64 Kbps. A telephone line is voice-band channel and is one of the most widely used methods of transferring data.
- A **broadband channel** can transmit large volumes of data at speeds of over 45.48 Mbps (the global average). Communications satellites, coaxial cables, fibre optic cables and microwave links are commonly used to provide these channels. Microwave signals are very high-frequency radio signals that can be transmitted through space. A communications satellite accepts signals beamed to it from a point on Earth and then reflects the signals to another point. Communications satellites can transmit data that includes text, voice, pictures and video.

3 **a** Explain the term 'LAN'.

b List THREE advantages of a LAN.

c List THREE disadvantages of a LAN.

d Name TWO organisations that may use a LAN.

e Explain the purpose of the LAN in each.

a A **local area network (LAN)** consists of a collection of microcomputers, such as in an office building, department or school, that can share peripherals, files and programs and communicate with each other on the network.

b Three advantages of a LAN:

- Hardware such as printers can be shared.
- Storage facilities can be shared.
- Software and data files can be shared by many users.
- Users can work together on a single document.
- Users can communicate using email.

(Any three)

c Three disadvantages of a LAN:

- The initial set-up costs are high.
- There is an increased risk of data corruption. Since many users will be using the system, there is a greater chance of data being corrupted or tampered with.
- There is a greater risk from malware, as they can be easily spread among the computers that are part of the LAN.

d Two organisations that may use LAN are:

- schools
- businesses.

e The purpose of using the LAN in each organisation:

- in schools, is for learning purposes
- in businesses, is for working purposes.

4 **a** Explain the term 'wireless LAN (WLAN)'.

b State TWO advantages and TWO disadvantages of using a WLAN.

c What devices are necessary to create a WLAN?

a A **wireless LAN (WLAN)** can be used where it may be difficult or impractical to use a cabled LAN, such as in homes, large offices, warehouses and lecture halls. In a building with many rooms or large halls, a few access points (a networking hardware device that allows a Wi-Fi device to connect to a wired network) may be needed.

b Advantages and disadvantage of using a WLAN are as follows.

Advantages:

- wireless LAN has the same features that are available in a wired LAN
- provides greater flexibility in acquiring information
- increased efficiency due to less wiring
- reduced wiring cost.

(Any two)

Disadvantages:

- slower data transmission speeds compared to a wired LAN
- the problem of corruption of data due to interference from other users or devices that use the same 2.4 GHz band
- risk of illegal access to information.

[Any two)

c The devices that are necessary to create a WLAN are a switch, a router and an access point.

5 Explain the purpose of the following devices in a wireless LAN (WLAN).

a Access point **b** Switch **c** Router

a An **access point** is a device that is attached to a LAN network and contains a radio transmitter/receiver, encryption facility and communications software. It translates computer signals into wireless signals, which it broadcasts to wireless NICs on the network. NICs, which are equipped for wireless communications receive these signals, and can transmit back. They have a fixed or detachable radio antenna in place of the usual coaxial cable. The access point and the NIC communicate with each other using a 2.4 gigahertz (GHz) radio band. The access point performs its role in reverse when transferring signals from a wireless NIC to the conventional network: it translates wireless signals received from NICs into wired signals.

b The devices that form part of the network are connected to **switches** or hubs. A switch is a device that connects multiple devices on the same network to facilitate communication among the devices.

c Another device that forms part of a network is a **router**. This device acts as an interface between two networks. It helps to facilitate communication between your home network and that of the internet service provider (ISP). It takes the information provided by the modem and routes it to the various devices that are connected. Devices (such as computers, televisions, game consoles, digital picture frames) can be connected to a router in one of two ways – wired directly to the router or wirelessly.

6 **a** What is a wide area network (WAN)?

b Name TWO organisations that may use a WAN.

c Describe TWO benefits of a WAN to one of the organisations stated in question **b**.

a A **wide area network (WAN)** can connect mainframes, LANs and PCs across a large geographical area such as a city, a state or a country. LANs are often connected to WANs using a special interface device called a gateway.

b Two organisations that may use a WAN are, for example, companies and banks.

c Benefits of a WAN to companies and banks:

- To share information and processing loads between the various branches.
- WANs can also be used to publish documents and distribute software.

7 To allow users to refer to hosts by names, the Domain Name System (DNS) was developed.

a What is the Domain Name System?

b Using the web address '*Caribbean.holiday.fun.com*', explain how the DNS system works to locate information on the internet.

a The **Domain Name System (DNS)** was divides the internet into a series of domains. It uses a hierarchical naming system or tree structure to represent a host.

b A domain is divided into second-level domains, which further subdivide into third-level domains and so on. A host is therefore named for the largest domain to which it belongs, then for any sub-domains within the largest domain, and then finally for the unique hostname. Domain names are easier to remember because they are alphabetic. The internet operates with IP addresses. Therefore, every time you use a domain name, a DNS service must translate the name into the corresponding IP address to allow the internet host to find another internet host. For example, the domain name www.example.com might translate to 198.105.232.4

Research questions

1 You have recently been given an internship at a local manufacturing company that has patents for several products. The company is considering setting up a wireless LAN (WLAN). However, several individuals have raised concerns about the use of a wireless LAN in the company. The manager has asked you to provide answers for some of the concerns raised.

a What hardware is required for a WLAN?

b Would the thick walls in the building affect the network? If it would affect the network, how can it be resolved?

c What security concerns exist for a WLAN? If there are security concerns, what steps can be taken to protect the network?

d Does the wireless network present any health hazards?

e What advantages does a wireless network have over a wired network for the needs of the company?

Students' research will vary. Make sure students have the sources or URLs of their research. Here are some example answers.

a Many links will come up. Students should have no trouble with this research. For example, the hardware required for a WLAN includes antennas, access points, routers, adapters and repeaters. Other sites will mention wireless NICs, and so on.

b Yes. The thick walls in the building will affect the network, so they should install signal boosters.

c A security concern that exists for a WLAN are denial of service attacks. The steps that can be taken to protect the network are to upgrade the WLAN security protocols.

d No, there have been no confirmed health hazards presented by the wireless network.

e The advantages that a wireless network has over a wired network for the needs of the company are:

- It provides a high data rate due to small area coverage.
- It is easier to add or remove a workstation.

2 **a** What internet access plans are available in your country?

b Prepare a table comparing the internet access plans in your area. Include the name of the provider, the type of access (cable or wireless), access speeds and cost.

c Based on your and your family's usage, which plan would you purchase? Justify your choice.

Students' research will vary. Here are some examples.

a The following internet access plans are available, according to students in South Africa, for example: Afrihost, Cell C, Virgin Mobile, MWEB, Vodacom, Neotel, Telkom, Axxess and others.

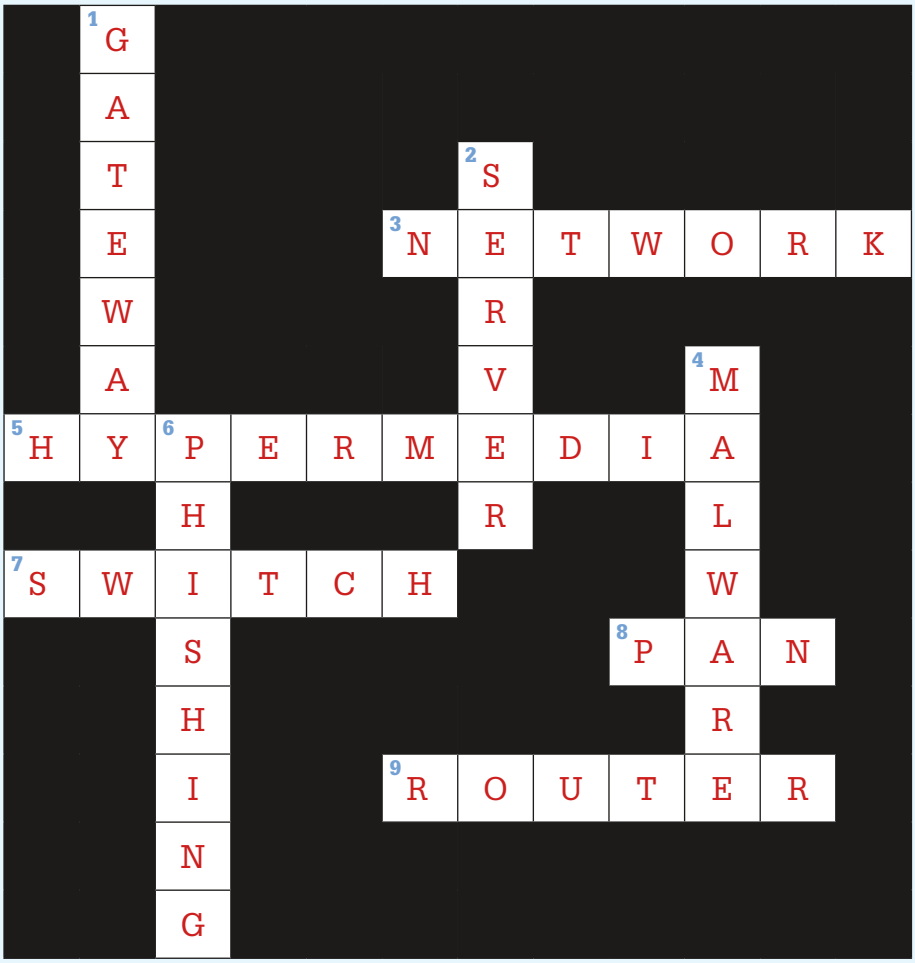
b Students' tables will vary. Check that they have used:

- the correct table heading, 'Table to compare the internet access plans in my area'
- the correct column headings, 'Name of provider', 'Type of access (cable or wireless)', 'Access speed' and 'Cost'.

Students should also have been able to find all the information that they needed. Remind them to add their sources.

c Students' choice of plan that they would purchase will vary. Make sure students are able to justify their choice with valid/logical reasoning.

Crossword



Across

3 A group of two or more computers linked together so that they can share resources (hardware, software and data) and can communicate with one another (7)

5 A general name for documents that contain links to text, graphic, sound or video files (10)

7 A device that connects multiple devices on the same network to facilitate communication among the devices (6)

8 A computer network organised around an individual person and is set up for personal use only (3)

9 This device acts as an interface between networks (6)

Down

1 An interface that enables communication between two different networks (7)

2 Runs the networking software that allows resources to be shared with the other computers (called clients) on the network (6)

4 Software that is intended to corrupt, steal, disrupt, or erase data or information on a network (7)

6 Attempts by cybercriminals and hackers to trick you into giving away personal information to gain access to account numbers (8)

Questions and answers 9

Fill in the blanks

1 The unique and original works of someone or an organisation is referred to as **intellectual property (IP)**.

2 A **trademark** can be a name, word, slogan, design, symbol or another unique device that identifies a product or organisation.

3 **Copyright** law prohibits unauthorised actions such as duplication, publication, and sale of the material.

4 **Plagiarism** refers to the act of using the work of another author without authorisation or representing the work of an author as one's own.

5 The MLA style uses **parenthetical** citation to refer to the works of other authors in someone's research.

6 Most cases of plagiarism can be avoided by **citing** the sources from which the information was taken.

True or False?

1 There is nothing wrong in copying, using or selling copyrighted electronic content from the internet. **False**

2 Copyright applies to work that is recorded in some way. **True**

3 Plagiarism involves both stealing someone else's work and trying to pass it off as your own. **True**

4 Changing words but copying the sentence structure of a source without giving credit is an example of plagiarism. **True**

5 The credentials of the author are a good indication of the accuracy of the information in an online source. **True**

Multiple-choice questions

1 Which of these refers to Intellectual property (IP)?

a Ideas **b** Art

c Inventions **d** **All of these**

2 The following are examples of plagiarism, except:

a failing to properly reference work.

b submitting someone else's work as your own.

c copying words or ideas from someone else's work without giving credit.

d **including all in-text citations and a complete reference list at the end of the paper.**

3 Plagiarism also includes using which of the following without permission?

a An image **b** A video

c A piece of music **d** **All of these**

4 Which of these is a correct APA in-text citation for an article written by Brown in 2017?

a **Brown (2017)** **b** (2017, Brown)

c 2017 (Brown) **d** (2017, Brown)

5 Which of these is the correct format to reference a CD-ROM using the APA format?

a **Author, Initial. (year). Title [CD-ROM]. Place of publication: Publisher.**

b Author, Initial. (year). Title [CD-ROM]. Publisher: Place of publication.

c (Year) Author, Initial. Title [CD-ROM]. Place of publication: Publisher.

d Initial. Author. (Year) Publisher: Place of publication. Title [CD-ROM].

Short-answer questions

1 Define the terms 'intellectual property' and 'trademark'.

Intellectual property (IP) refers to unique and original works of someone or an organisation.

A **trademark** can be a name, word, slogan, design, symbol or another unique device that identifies a product or organisation.

2 Explain the term 'intellectual property rights'.

Intellectual property rights are the rights to which creators are entitled to their work.

3 **a** Explain the term 'plagiarism'.

b Give THREE examples of plagiarism.

a **Plagiarism** refers to the act of using the work of another author without authorisation or representing the work of an author as one's own.

b Examples of plagiarism are:

- submitting someone else's work as your own
- copying words or ideas from someone else's work without giving credit
- failing to reference work properly (by not using quotes or giving incorrect information about the source)
- changing words but keeping the sentence structure of a source without giving credit to where it came from.
- Plagiarism also includes using an image, video or piece of music in work you have produced, without receiving proper permission or providing an appropriate citation. This includes:
  - copying images from other websites to paste them into your own papers or websites without referencing
  - making a video using material from someone else's videos without giving credit or getting permission from the original creator of the video
  - using copyrighted music as part of the soundtrack of a video you created, without permission
  - performing another person's copyrighted music without permission.

(Any three)

4 Explain FIVE ways to determine the accuracy of online information

Five ways to determine the accuracy of online information:

- **Source** – Where did this information come from? (Does the source come from a national or international organisation? Does it come from an educational institution?) The best online sources will give information concerning what organisation they are. Information coming from governments, educational institutions and large organisations are usually reliable. The URL of the organisation usually gives an indication of the type of organisation (.edu .gov and so on). Looking at the online information, does it clearly state who is sponsoring the website? Is there a link to a page stating who the organisation is? Can you verify the legitimacy of the sponsor? Most dependable websites will have a date and who wrote the article.
- **Author** – An important part in determining the accuracy of the information is the person giving the information. What credentials does the person have? The credentials of the author is a good indication of the accuracy of the information.
- **Objectivity** – An important factor in using online information is determining the objectivity of the writer. Is the information provided as a public service or an advertising company? If the writer is giving the information as part of a paid advertisement firm the information may be persuaded towards the information it gives.
- **Date** – What is the date of the information? Most accurate information online has a date that it was written or updated. Information should be as current as possible.
- **Complete** – Is the content comprehensive? Does the article provide a 'works cited' page or reference page concerning the sources used to write the article? Scholarly online articles list a 'works cited' page.

5 What is the function of a copyright organisation?

Copyright organisations are responsible for protecting the rights of content creators.

6 **a** Name THREE copyright organisations in Jamaica.

b Name ONE copyright organisation in Trinidad and Tobago.

a Examples of three copyright organisations in Jamaica:
- Jamaican Copyright Licensing Agency (JAMCOPY)
- Jamaica Music Society (JAMMS)
- The Jamaica Association of Composers, Authors and Publishers (JACAP).

b An example of a copyright organisation in Jamaica is: Copyright Music Organisation of Trinidad and Tobago (COTT).

7 For each of the following, state which law may have been broken according to the Jamaican cybercrime act of 2015.

a James copied the file containing the end-of-term examination from his teacher's laptop and shared it with his friends.

b Mary was upset with her friend Kim, so she uploaded a lot of false statements about Kim on Facebook to damage her reputation.

c Billy used his computer to hack into the school database to change his examination grades.

d Shelly used her computer programming skills to download copyright software and distribute to her friends.

e Mr Data installed a virus in his company's network because the company did not give him a pay raise.

Make sure that all students are able to find a link to the act on the internet.

Examples of the law that may have been broken according to the Jamaican cybercrime act of 2015 for each example:

a Plagiarism

b Defamation

c Computer fraud

d Software piracy

e Malicious damage

Research questions

1 Use the internet to conduct research and answer the following questions.

a State the copyright laws of Jamaica.

b State the penalty for breaking the law.

c Give TWO examples of products patented by Jamaicans.

d Give examples of breaches of copyright laws within the last five years in Jamaica, and what the consequences were. Students in other countries can answer the question based on their country.

Students' research will vary. Here are some example answers.

a Under Jamaica's Copyright Act 1993, copyright applies to original literary, dramatic, musical or artistic works, sound recordings, films, broadcasts or cable programme, typographical arrangements of published editions.

Literary works include works (other than a dramatic or musical work) which are written spoken or sung, such as poetry, plays, novels, sermons or computer programs.

Dramatic works include dances and mimes.

Musical works refer to the melodic content of the work - lyrics are treated as literary works.

Artistic works include graphic works such as paintings, drawings, maps, charts, plans, engravings, etchings, lithographs, woodcut or similar works, as well as photographs, sculptures, collages, buildings and models of buildings. *(Source: https://www.jipo.gov.jm/node/47)*

b The penalty for breaking the law in Jamaica:

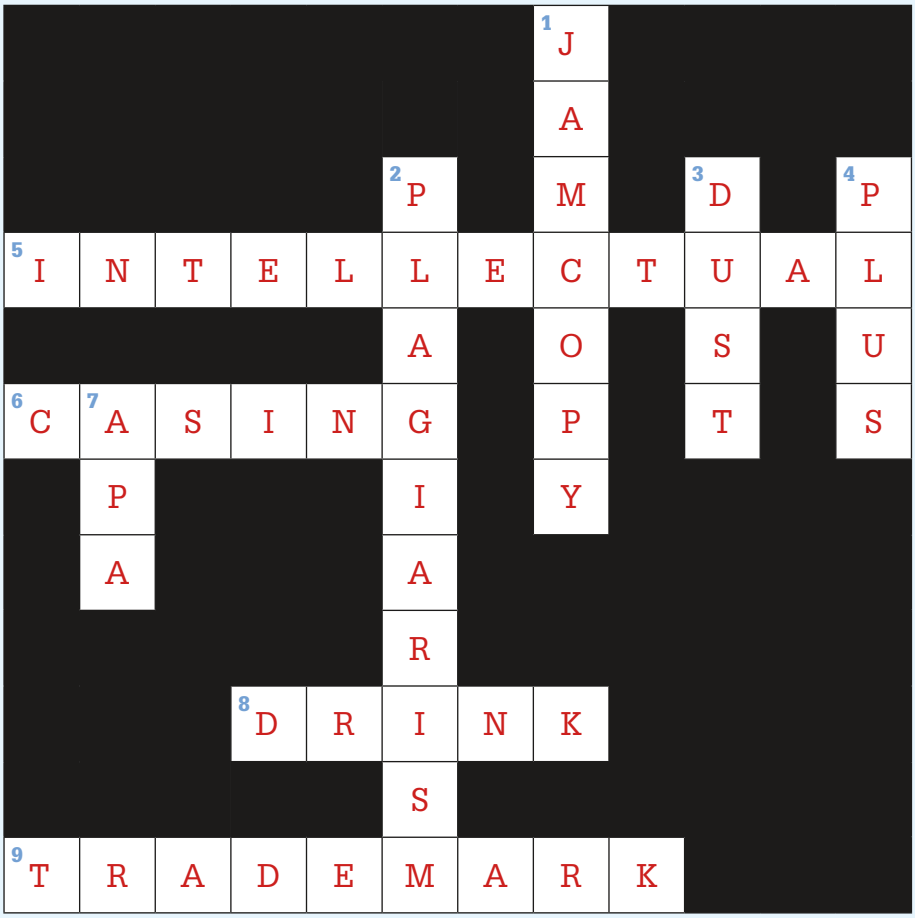
- Pay a fine (the amount will vary but can be a large amount).
- Enter into a legal case against the complainant (which could be costly).
- Spend time in jail (and have a criminal record).

c Two examples of products patented by Jamaicans:

- Caracsol eye drops
- Ortanique fruit (a type of orange citrus fruit).

d Students' answers will vary. Make sure that they are able to do the research by finding helpful links.

Crossword



Across

5 _____ property refers to unique and original works (12)

6 Do not open the computer's _____ (6)

8 Do not do this in a computer lab (5)

9 Name, word, slogan, design, symbol or another unique device that identifies a product or organisation (9)

Down

1 A Jamaican copyright organisation (7)

2 Passing off another author's work as your own (10)

3 Avoid exposing the computer to excessive _____ (4)

4 Placing this sign in front of a word tells the search engine to include it in all the search results (4)

7 A style of referencing that is the most common method used to cite sources within the social sciences (3)

Questions and answers 10

Fill in the blanks

1 Computer **ethics** is a set of moral principles that regulate the use of computers, mobile devices, networks and information systems.

2 **Public** domain software can be copied as many times as you like.

3 Software **piracy** is the unauthorised copying, use or selling of software that is copyrighted.

4 Websites that allow individuals to download unauthorised copies of software are engaging in internet **piracy**.

5 **Digital** citizenship means learning how to use technology in ways that are appropriate, responsible and intelligent.

6 **Netiquette** means respecting other users' views and displaying common courtesy when posting your views online.

7 **Flaming** is writing content online that intentionally triggers responses such as rage, sadness, humiliation and self-doubt.

8 An illegal act committed online or via the internet is referred to as a **cybercrime**.

9 A **computer** crime is any illegal act that involves the use of a computer or related devices.

10 **Cybercrimes** are crimes that are directed at computers or other devices (for example, hacking), and where computers or other devices are integral to the offence.

True or False?

1 Software piracy is an infringement of ownership rights. **True**

2 Pirated software may not contain all the elements and documentation of the program, causing problems for the user. **True**

3 Accessing someone's personal information on a computer system without their permission is legal. **False**

4 All software is copyright. **True**

5 Freeware software cannot be copied as many times as you like for personal use. **False**

6 The internet has created a global platform in which billions of people all over the world interact using various technologies. **True**

7 Digital citizens must act in a certain way according to accepted norms, rules and laws. **True**

8 Digital citizenship encompasses digital literacy. **True**

9 Every digital citizen should be aware of good netiquette in the cyberworld. **True**

10 Netiquette means respecting other users' views and displaying common courtesy when posting your views online. **True**

Multiple-choice questions

1 The following are examples of software piracy except:

a internet piracy.
b counterfeiting.
c freeware duplication.
d licensed-user duplication for unlicensed users.

2 Digital citizenship means learning how to use technology in ways that are:

a appropriate, responsible and intelligent.
b appropriate, efficient and entrepreneurial.
c investigative, entrepreneurial and friendly.
d none of the above.

3 Which of the following refers to flaming?

a Posting copyrighted material to which you do not own the rights.
b Writing content online that intentionally triggers responses such as rage, sadness and humiliation.
c Typing your online documents or comments in ALL CAPS.
d Forwarding jokes and chain letters to recipients.

4 Which of the following is an example of good netiquette?

a Typing your comments in ALL CAPS
b Posting any videos you receive to all your friends without their permission
c Forwarding jokes and chain letters to all your friends
d Staying on-topic in a forum

5 Which of the following is an example of cyberbullying?

a Sending friendly emails to a classmate.
b Helping your friend with her homework online.
c Gathering and posting personal information on an individual online.
d None of the above.

6 Which of the following might be the best method to deal with cyberbullying?

a Suspend your social networking accounts until stalking stops
b Try to meet stalker to have a discussion
c Ignore stalker and hope it stops
d All of the above

7 A person who deliberately posts abusive or derogatory online comments to social media or websites to provoke reactions from readers is known as a:

a hacker.
b stalker.
c troll.
d cyberbully.

8 Malware is usually spread by all of the following, except:

a the unintended download of infected programs and files from the internet.
b opening infected files received through emails.
c placing an infected storage device such as a USB drive with other storage devices in the same desk drawer.
d self-propagation.

9 One method of avoiding phishing attempts is:

a trying to contact the individual responsible for the phishing attempts.
b double-checking that every URL where you enter your password looks legitimate.
c hiring a hacker to hack the phisher.
d clicking the links the phisher sent to see what happens.

Short-answer questions

1 Explain the term 'computer ethics'.

Computer ethics is a set of moral principles that regulate the use of computers, mobile devices, networks, and information systems.

2 Give TWO examples of unethical behaviour related to computer use.

Copying, using or selling copyrighted digital content from the internet or other sources without the author's permission and accessing someone's personal information on a computer system without their permission.

3 **a** Explain the term 'digital citizenship'.

b List THREE aspects of digital citizenship.

a Digital citizenship means learning how to use technology in ways that are appropriate, responsible and intelligent.

b Aspects of digital citizenship. It encompasses:

- digital literacy
- etiquette
- norms
- culture
- ethics
- online safety
- rights
- commerce and more.

(Any three)

4 **a** What is meant by the term 'netiquette'?

b Describe FIVE tips for practising good netiquette.

a **Netiquette** means to respect other users' views and to display common courtesy when posting your views online.

b Tips for practising good netiquette:

- Do not send or post a flame. Flaming is writing content online that intentionally triggers responses such as rage, sadness, humiliation, self-doubt and others.
- Refrain from posting offensive and insulting messages. You may express robust disagreement with what someone says, but do not call them names or curse or threaten them with personal violence.
- Stay on-topic. Do not post about cricket in a football forum.
- Do not post copyrighted material to which you do not own the rights.
- Only forward jokes and chain letters if you are sure the recipient wants them.
- Do not type your documents or comments in ALL CAPS. This is referred to as 'shouting'. It can be seen as offensive by some individuals and is also especially hard to read.
- Do not share offensive photographs or videos.

(Any five)

5 Cybercrime is an issue that impacts the lives of many people, businesses and organisations around the world.

a Explain the terms 'cybercrime' and 'cybercriminal'.

b List THREE forms of cybercrime.

a **Cybercrimes** are crimes, which are directed at computers or other devices that are integral to the process.

Cybercriminals are individuals or teams of people who use technology to commit malicious activities on digital systems or networks with the intention of stealing sensitive company information or personal data and generating profit.

b Forms of cybercrime:

- hacking
- cyberbullying or stalking
- online scams and fraud
- identity theft
- attacks on computer systems
- illegal or prohibited online content.

(Any three)

6 Cyberbullying is becoming very common among secondary school students.

a Explain the term 'cyberbullying'.

b List THREE software tools used for cyberbullying.

c Explain the difference between cyberbullying and stalking.

d State THREE examples of some of the ways cyberbullying can occur.

e List THREE steps someone can take to deal with the problem of cyberbullying.

a **Cyberbullying** is the act of using an electronic or digital device to make someone feel sad, afraid or angry.

b Examples of software tools for cyberbullying:

- emails
- tweets
- instant messaging such as WhatsApp or SMS.
- social networking sites
- blogs

(Any three)

c The primary distinction between cyberbullying and cyberstalking is age. If adults are involved, the act is usually termed cyberstalking, whereas among children it is referred to as cyberbullying.

d Some of the ways that cyberbullying can occur:

- posting hurtful messages, images or videos online
- repeatedly sending unwanted messages online
- excluding or intimidating others online
- creating fake social networking profiles or websites that are hurtful
- gathering and posting personal information about an individual
- spreading false rumours about an individual and encouraging others to join in the harassment
- sending devious, threatening, vulgar or harassing emails from a variety of email accounts
- hacking into an individual's online banking or email accounts and changing their settings and passwords
- any other form of digital communication that is discriminatory, intimidating, intended to cause hurt or make someone fear for their safety.

(Any three)

e Steps that a person can take to deal with the problem of cyberbullying:

- Suspend your social networking accounts until the stalking stops.
- Adjust your privacy settings on your social networking sites if you wish to continue to using them.
- Always use a strong, unique password for every social networking site.
- Limit how much personal information you post to your account.
- Do not accept 'friend' or 'follow' requests from strangers.
- Warn your friends and acquaintances not to post personal information about you, especially your contact information and location.
- Do not post photographs of your home, which might reveal its location.
- Avoid posting information about your current or future locations, or providing information that a stalker may use to find your location.

(Any three)

7 **a** Explain the term 'internet troll'.

b Describe THREE methods to deal with trolls.

a An **internet troll** is a person who deliberately posts abusive or derogatory online comments to social media or websites to provoke reactions from readers.

b Methods to deal with trolls:

- Establish a detailed policy of what kind of comments are allowed on your website.
- Ignore the comments made by trolls; trolls seek attention. They want to make you angry, frustrated or uncomfortable. It is similar to not responding to an annoying student in your class.
- Respond with humour, as humour is not the reaction the troll is looking for from the users of a site.
- Reveal the troll's identity if possible. This may make them feel powerless and think twice about leaving nasty comments on your website, blog or social media account.
- Fight back with facts; discrediting the troll with facts may stop the attacks.

(Any three)

8 **a** Give THREE examples of types of content that may be classified as prohibited, offensive and illegal.

b Explain ONE potential risk of prohibited, offensive and illegal content.

a Examples of types of content that may be classified as prohibited, offensive and illegal:

- child pornography or child abuse
- content that shows extreme sexual violence or materials that are overly violent
- content that provokes the viewer into committing crimes and carrying out violent acts
- content that promotes terrorism or encourages terrorist acts.

(Any three)

b A potential risk of prohibited, offensive and illegal content is that it may reach children, for whom such content can be especially damaging.

9 **a** Define the term 'software piracy'.

b Describe THREE main types of software piracy.

c State THREE reasons why pirated software should not be used.

a **Software piracy** is the unauthorised copying, use or sale of software that is copyrighted and is not public domain software or freeware.

b The main types of software piracy are:

- softlifting (softloading or end-user piracy); licensed-user duplication for unlicensed users
- hard disk loading; pre-installed piracy in a shop
- peer-to-peer (P2P) file sharing, a method of file sharing that allows normal users 'peers' to share copyrighted works that they have no right to share
- internet piracy; when websites allow individuals to download unauthorised copies of software.
- counterfeiting, which occurs when individuals or companies make illegal copies of software and package it to look like the original packaging from the manufacturer.

(Any three)

c Reasons why pirated software should not be used:

- It may not contain all the elements and documentation of the program, causing problems for the user.
- It may not have the upgrade options that are often provided as an add-on (for example, with an encryption key) in legitimate software.
- It may have viruses that can be harmful to your hard drive or network.
- It is simply illegal – most countries have laws against software piracy. Individuals convicted of this crime can pay hefty fines or even be jailed.

10 **a** Explain the term 'copyright' with reference to software.

b Explain the difference between public domain software and freeware software.

a All software is copyrighted – the person or company who wrote it always retains the right to decide whether it can be copied or not.

b It is not always illegal to copy and distribute software.

For example, **public domain** software can be copied as many times as you like. Software is in the public domain when it is put on websites for free distribution, with the consent of the copyright owner.

Freeware software, which you can copy but not change, is available at specialist websites such as Ninite.WOT and softpedia. (WOT stands for: Web of Trust.)

Research questions

1 Using the internet to conduct research, complete the table for THREE major forms of cybercrime committed over the last five years. List the type of crime, the year it was committed, a description of the crime and the loss incurred.

Type of cybercrime	Year committed	Description of crime	Loss incurred

Students' research will vary.

Were they able to source a site from which they could find three major forms of cybercrime committed over the last five years?

Were they able to list the types of cybercrimes, the year committed for each, a description of each crime and the financial loss incurred for each?

Students should be able to find cybercrime incidents relatively easily. They might find that finding the financial losses incurred is more challenging.

2 Using the internet to conduct research, which of the following islands in the Caribbean have laws to protect citizens from computer crimes and cybercrime?

Name of island	Name of law or act
Jamaica	Cybercrimes Act, 2015
Trinidad and Tobago	Cybercrime Bill, 2017
Barbados	Computer Misuse Act, 2005
St. Lucia	Cyber Security and Cybercrime Action Plan

3 Malware can cause problems for individuals and organisations. Complete the following table to show the names of THREE malware that have caused problems for organisations and individuals within the last 10 years.

Name of malware	Year	Description of the attack	Effects of attack/cost to the individuals and organisations
SamSam	2015	Attacked healthcare facilities in USA	Over $30 million in losses
Ryuk	2018	Attacked water utilities and newspapers	Over $55 million in losses
PureLocker	2019	Attacked Windows and Linux-based production servers at enterprises	Over $42 million in losses worldwide

Questions and answers 11

Multiple-choice questions

1 Which of the following are not forms of CAI?

a CD-ROM encyclopaedias **b** Drills

c Simulations **d** Tutorials

2 Applications of computers in banking include all of the following, except:

a ATM **b** EFT

c CAI **d** Smart cards

3 Which of the following is not a form of surveillance?

a Wiretapping **b** Communication interception

c Location information **d CAT scan**

4 Magnetic Resonance Imaging (MRI) is used for all of the following, except:

a strokes. **b broken bones.**

c tumours. **d** haemorrhages.

5 Which of the following is not an advantage of a medical expert system?

a Supports a doctor who is doubtful of a diagnosis

b Can arrive at a faster, more accurate conclusion

c Cannot learn from its mistakes

d Gives a detailed explanation of how it has reached its decision

Short-answer questions

1 Explain how these jobs might benefit from IT skills. Do any of the jobs not require IT skills?

a A garbage man

b A taxi driver

c A library clerk

d An assembly line worker

e An office filing clerk

Students' answers will vary. Here are some example answers.

a In most countries, a garbage man or woman does not currently need IT skills. However, with ever-growing technology, he or she may need IT skills in the future; possibly for checking electronic equipment put into the trucks for measuring the amount and kind of waste.

b A taxi driver might need IT skills for electronic equipment installed in the car, for fare amounts, takings for the day, keeping a record of who rode in the taxi, and so on.

c In the past, a library clerk did not need IT skills. Today, however, IT skills are needed for keeping a record on a computer of all the books that are in the library, the books that are borrowed, brought back, missing, late, and so on.

d An assembly line worker might or might not need IT skills, depending of whether he or she works in an older or more modern factory. Modern factories will have electronic equipment, which the assembly line workers may need to know how to read, for things such as: time to fill each can or box, etc., time spent working, input, output and so on.

e An office filing clerk in a modern office will need IT skills in order to keep a record on a computer of all the documents and materials that have been filed.

2 What do each of the following stand for?

a CADD

b CAD

c CAE

d CAM

e CAI

f CAL

a Computer-Aided Design and Drafting (CADD) – this is a program that allows the creation of 2D objects using the computer.

b Computer-Aided Design (CAD) – this is a program that allows for the creation of 2D and 3D objects using the computer.

c Computer-Aided Engineering (CAE) – these systems analyse engineering designs, by simulating varying conditions to determine in advance whether the design is likely to work.

d Computer-Aided Manufacturing (CAM) – these systems are used to control manufacturing plant equipment and production equipment.

e Computer Aided Instruction (CAI) – this is where computers are used to present and monitor the learning that takes place, using graphics, videos, and so on.

f Computer Assisted Learning (CAL) – this is where a computer program is used to assist the user in learning a particular subject.

3 List THREE specialist IT jobs and explain what these jobs entail.

Specialist IT jobs are as follows, in alphabetical order.

Application programmers: Write software to meet end-user requirements such as typing, drawing, calculating and gaming, and may produce applications such as payroll programs, science programs and word processing programs.

Computer operators: Monitor and control the central computer system (or console) by starting up and shutting down the system and responding to messages from the system. They also perform routine maintenance such as cleaning drives, loading input and output systems such as tape drives or paper in printers, and keeping logs on system performance.

Database administrators (DBAs): Responsible for the administration and management of a company's database. This involves the effective and efficient storage, retrieval, customisation and archiving of data.

Data-entry operators: Enter data into the system from source documents (documents used for recording data that is to be fed into the computer later). They keep records of the data that they have entered and verify that data.

File librarians: Keep all of a company's data files and software organised through the cataloguing and storing of tapes and disks. They maintain and protect that data. They also clean and inspect the data storage media.

Helpdesk or service desks specialists or technicians: Provide users with assistance and support when they have an issue or problem with their computer system, hardware or software. They do this either over the phone, via email, chat or in person, and they usually work closely with IT department personnel to resolve issues that may need more knowledge or expertise than they possess. They need to troubleshoot problems and advise on a course of action.

Information systems (ICT or Data processing) managers: Responsible for planning, coordinating, managing and staffing the Information systems department of a large organisation.

Network administrators: Create, manage and secure computer networks in their organisation. They troubleshoot problems, issue passwords to individual users and allow access to the system by setting up user accounts. They start and shut down the network and can also restrict users' access to certain files, folders and websites.

Operations managers: In charge of the daily operations of the computer department. Are responsible for supervising the use and maintenance of the computer equipment, supervising the receiving and preparation of data, scheduling processing activities, allocating duties to staff, and consulting with the data processing manager.

Programmers (classified according to the types of programs they develop – application or systems): Develop software, both application software and systems software. They discuss program specifications or requirements with systems analysts, write programs, test and debug programs (correct errors), document the program (using manuals or internal comments), update it, repair it, modify it and further develop existing programs.

Systems analysts: In charge of developing a system from start to finish. They analyse the problem to find a solution, then develop the system and implement and test the system. They usually work to a budget and may have a team of individuals working with them.

Systems operator (sysop): Runs a computer server. Is responsible for maintaining and performing maintenance and routine operations on the server.

Systems programmers: Write systems software, such as programs to monitor and control peripheral devices such as printers, speakers and Wi-Fi cards or adaptors.

(Any three)

4 Research: TWO other IT specialist jobs.

Other IT specialist jobs are as follows, in alphabetical order.

Computer consultant: Give an independent and objective opinion on how ICT can be used to meet the needs of an organisation. She or he is usually contracted for a short period of time to provide technical assistance to an organisation in areas such as systems analysis, design and programming, in the formation or upgrading of a data processing department.

Computer engineers: Design components, test and assemble them. Items such as microprocessors and circuit boards, as well as computer peripherals, are examples of these components.

Computer technicians: Sometimes called computer repair technicians, are called when a computer system is not working as it should. They maintain, repair and install hardware and software. Computer technicians may be employed as part of an organisation or can be outsourced, that is, they may have their own business and be called to perform a service (independent service providers).

Data security analyst/Data security specialists: Look after the security and protection of the company's data. They protect the company's computer systems against threats from hackers, viruses, power outages, fraud, theft and invasion of privacy.

Mobile App Developer: Development of software specifically designed for mobile devices to meet the needs of the users. Has become one of the fastest-growing IT careers in the world. The advancement of mobile technology has caused an explosion in this field.

Multimedia artists and animators: Develop moving pictures with the use of computers for use in game development, use on the internet, in movies and television. They may work with a web developer/designer or a programmer to develop their design.

Software engineers: Specialists who design or create software. They may or may not write actual programming code but they must be competent in programming. They work together with both the business and the programmers, explaining the business functions to the programmers and the technology to the non-technical personnel.

Software testers/software test engineers: Hired by companies to perform quality control tests on the software that they produce. Their aim is to find any bugs in the program.

Software trainers/IT trainers: Design, develop and deliver training courses to individuals and organisations on a variety of software applications.

Webmasters: Internet specialists whose responsibilities range from monitoring internet traffic on the web server to answering queries about the website's operations. Their duties may include that of a web designer or someone who updates the webpages.

Webpage designers/developers: Build and maintain websites using programming languages such as HTML and Java. They maintain and improve webpages.

(Any two)

5 In the normal course of a day, you interact with computer systems and microprocessors. Make a list of these interactions.

Students answers will vary.

Has each student thought through the day carefully in order to list all her or his interactions with computer systems and microprocessors?

True or False?

1 Robotics is a form of artificial intelligence. **True**

2 You cannot use your debit card to purchase items in a shop. **False**

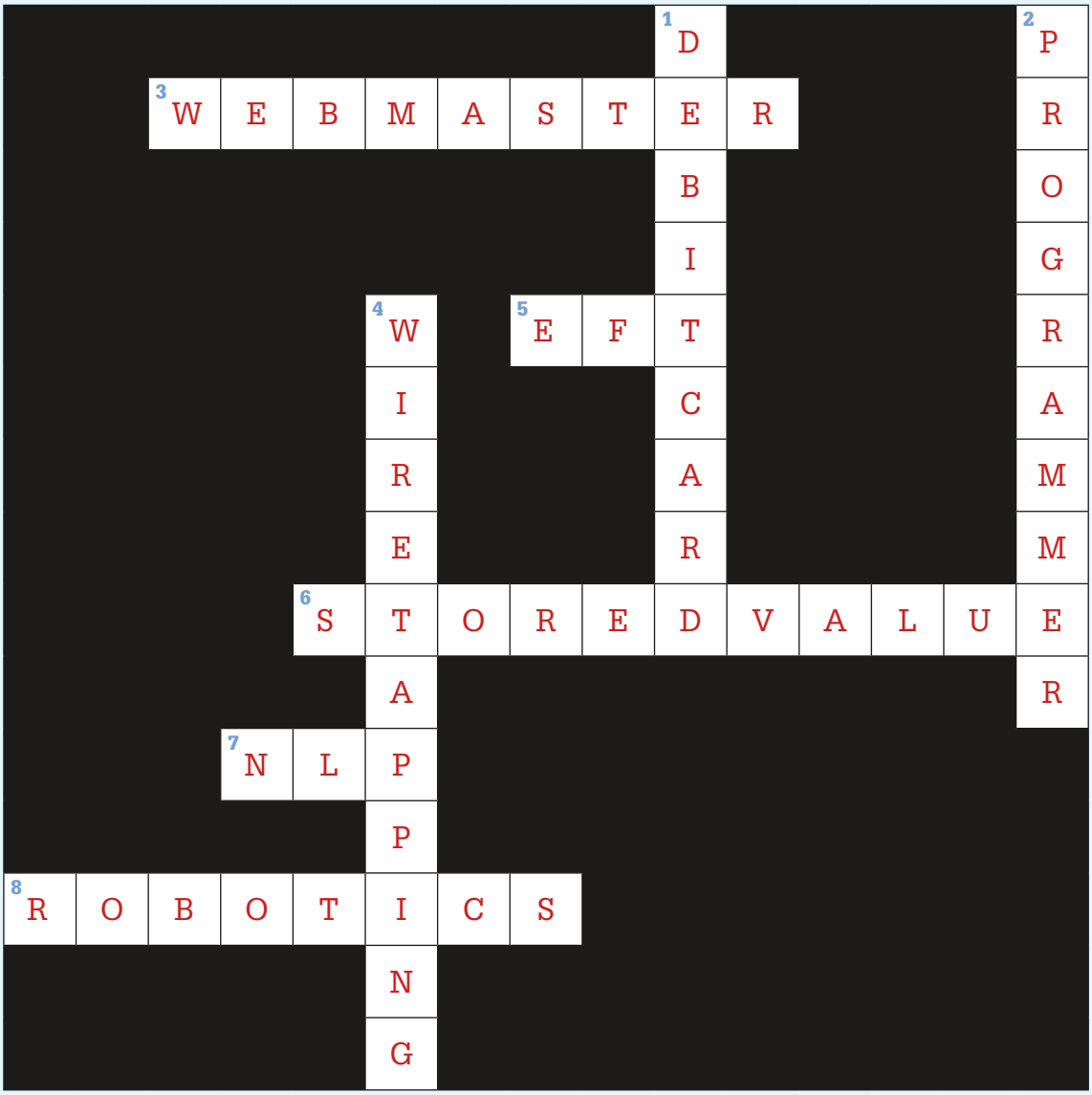
3 Many special effects in movies are a result of AI. **False**

4 Virtual reality systems are fictional systems, which are only spoken about in movies. **False**

5 Expert systems are only found in medicine. **False**

6 A systems analyst is in charge of developing a system from start to finish. **True**

Crossword



Across

3 A person who monitors internet traffic and may develop webpages (two words) (9)

5 The electronic movement of funds from one account to another (3)

6 A card that can be used to purchase specific items at a shop (two words) (11)

7 Voice recognition and voice synthesis systems are part of this (3)

8 The field involving computer-controlled machines (8)

Down

1 An ATM card (two words) (9)

2 A person who develops application and system software (10)

4 A form of electronic surveillance (two words) (11)

Questions and answers 12

Fill in the blanks

1 An **algorithm** is a formula or set of unambiguous steps that, if followed exactly, will solve a particular problem.

2 **Flowcharts** are diagrams used to help us visualise the sequences of algorithms.

3 **Writing** an algorithm makes it easier to convert it to programming code.

4 Each item of data is stored in an **array**.

5 We can use **variables** to represent values that change during the execution of a program or algorithm.

True or False?

1 A pseudocode is an algorithm. **True**

2 A problem is a computer program. **False**

3 Algorithms can only be written using the English language. **False**

4 Computer programs involve three types of instructions: input, processing and output. **True**

5 Flowcharts are diagrams used to help us visualise the sequences of algorithms. **True**

Multiple-choice questions

1 A specific rule for writing a particular computer language is called:

a an algorithm.
b **syntax.**
c program language.
d a solution.

2 A pseudocode is:

a a computer program.
b syntax.
c **a problem.**
d an algorithm.

3 Steps in solving a problem include:

a defining the problem.
b analysing the problem by determining what is needed to solve the problem.
c deciding what results we want to achieve.
d **all of the above.**

4 Which three types of instructions do computer programs need?

a Input, processing, preciseness
b Input, output, finiteness
c **Input, processing, output**
d Input, preciseness, finiteness

Short-answer questions

1 State the steps in problem-solving.

The steps in problem-solving:

1. Start with a clear understanding of what the problem is/define the problem.
2. Analyse the problem, that is, determine what we need to do to solve the problem.
3. Decide what results we want to achieve.
4. Consider different ways to achieve our result, and select the best option.
5. Develop a method or algorithm to solve the problem.

2 Explain the difference between an algorithm and a pseudocode.

The difference between an algorithm and a pseudocode:

An **algorithm** is a sequence of instructions, which, if followed will produce a solution to the given problem. The types of instructions written cannot be executed by a computer – they can only be followed by a person.

A **pseudocode** is an algorithm that models or resembles a real program written in a particular programming language for a computer; a pseudocode also cannot be executed by a computer.

3 Explain why an algorithm would not be executed by a computer.

Explanation of why an algorithm would not be executed by a computer:

Computer programs involve three types of instructions: input, processing and output. When writing an algorithm, we have to determine the input, processing and output instructions.

4 What is a computer program?

A **computer progra**m is a series of coded instructions for the computer to obey in order to solve a problem that can be executed by the computer.

5 In your own words, explain the term 'syntax.'

The specific rules for writing in a particular computer language are known as **syntax**.

Exercise

Use the problem-solving steps to develop an algorithm to solve the following problems:

1 Making a cake

> Check students' steps to see if they understand what needs to be done.
> Are the steps logical? Offer guidance as needed.

2 Calculating the average height of all the children in your class

> Check students' steps to see if they understand what needs to be done.
> Are the steps logical? Offer guidance as needed.

3 Calculating the total income from patrons attending a cinema show

> Check students' steps to see if they understand what needs to be done.
> Are the steps logical? Offer guidance as needed.

4 Draw a flowchart of the following algorithm.

```
INPUT A, B
IF B = 0 THEN
    PRINT "Cannot go further"
ELSE
    LET C = A/B
    PRINT C
ENDIF
```

What will be printed if:

a A = 48 and B = 2?

b A = 48 and B = 0?

> **a** and **b**
> Check students' flowcharts to see if they understand what needs to be done.
> Offer guidance as needed.

5 Draw a flowchart of the following algorithm.

```
INPUT C
IF C <= 100 THEN
    PRINT C
ELSE
    LET C = (C + .20 * C)
    PRINT C
ENDIF
```

What will be printed if:

a C = 120?

b C = 100?

> **a** and **b**
> Check students' flowcharts to see if they understand what needs to be done.
> Offer guidance as needed.

Questions and answers 13

Fill in the blanks

1 **Word processing** is the preparation of documents such as letters, reports, memos, books or any type of correspondence on a computer.

2 A **word processor** is an application program that allows you to do word processing.

3 **Print** layout mode is the mode you are in when you open a new Word document.

4 The feature that allows text to move automatically to the next line without having to press the Enter key is known as word **wrapping**.

5 **Formatting** allows you to change the appearance of the text in a document.

True or False?

1 A subscript effect is one in which characters are raised above the normal line. **False**

2 Bullets and numbering can be added to a completed list or to text that is being typed. **True**

3 Borders can only be placed around a page of a Word document. **False**

4 Graphics placed in a document cannot be resized or repositioned according to your needs. **False**

5 The mail merge feature allows you to produce large volumes of personalised letters, mailing labels, memos and emails without having to type each one individually for each recipient. **True**

Multiple-choice questions

1 From which group would you find the functions to apply effects to characters?

a Clipboard **b Font**

c Paragraph **d** Styles

2 Font style refers to which of the following:

a shape of the character. **b** height of a character.

c bold, Italic, Underline. **d** none of the above.

3 Which of the following is a group in the Home tab?

a Styles **b** Pages

c Tables **d** Header and Footer

4 The space allotted for binding is known as the:

a left margin. **b** right margin.

c gutter margin. **d** top margin.

Exercise

1 Type out the following and save as 'Effects' in the folder named 'Practice' in your flash drive.

a $40x^3 + 20x^2 - 5x + 25$ **b** $C_6H_{12}O_6$

a Check that each student was able to type the addition sentence correctly and save it on her or his flashdrive correctly.

b Check that each student was able to type the formula correctly and save it on her or his flashdrive correctly.

2 The data below is for five students – their student number, name, weight (kg) and height (cm).
001, Varun Birbal, 40.5, 140.5
002, Kerry Johnson, 45.2, 160.3
003, Phillip Maynard, 50.6, 165.0
004, Richard Wilson, 65.0, 166.3
You are required to:

a Type out the data in a tabular format with the given headings.

b Boldface and underline each line.

a and **b** You may insert a table (as shown below) or use the Tab key after each entry to get to the next column. You hit Tab until you get to the next column, or advanced users can set up Tab stops to get to the second, third and fourth columns, as shown here.

Student No.	**Name**	**Weight (kg)**	**Height (cm)**
001	Varun Birbal	40.5	140.5
002	Kerry Johnson	45.2	160.3
003	Phillip Maynard	50.6	165.0
004	Richard Wilson	65.0	166.3

Student No.	Name	Weight (kg)	Height (cm)
001	Varun Birbal	40.5	140.5
002	Kerry Johnson	45.2	160.3
003	Phillip Maynard	50.6	165.0
004	Richard Wilson	65.0	166.3

3 Customers who do not pay their monthly instalment are sent the following reminder letter by Top Brand Furniture Shop.

Top Brand Furniture Shop
Hope Road Kingston
Jamaica

18-01-2019
<<Title>> << First Name>> << Surname>>
<< First line of address>>
<<Second line of address>>
Dear <<Title>> <<Surname>>
Please be informed that our accounts are showing that you have not paid your monthly instalment of <<amount>> towards your purchase on <<date>>. Kindly pay the aforementioned amount to our account number <<account number>>, to avoid any inconvenience.
Yours truly,

_____
Lenore Brown
Credit Manager

a Type out the letter to be used as a mail merge document. Save it as 'Overdue' in your flash drive.

b Create a secondary document (data file) called 'Defaulters', with the following data:

Title:	Mr
First Name:	Conrad
Surname:	Lewis
First line of address:	10 Wilson Avenue
Second line of address:	Kingston
Amount:	$75,000
Date:	15-10-2018
Account Number:	OCT256

Title:	Mr
First Name:	Kelvin
Surname:	Harry
First line of address:	3 Hibiscus Lane
Second line of address:	Kingston
Amount:	$125,000
Date:	18-10-2018
Account Number:	OCT275

Title:	Ms
First Name:	Sherry
Surname:	Roach
First line of address:	18 Railroad Street
Second line of address:	Kingston
Amount:	$185,000
Date:	20-10-2018
Account Number:	OCT274

Example merge letters

Top Brand Furniture Store
Hope road Kingston
Jamaica

18-01-2019

Mr Conrad Lewis
10 Wilson Avenue
Kingston

Dear Mr Lewis,

Please be informed that our accounts are showing that you have not paid your monthly instalment of $75 000 towards your purchase on 15-10-2018. Kindly pay the aforementioned amount to your account number OCT256, to avoid any inconvenience.

Yours truly,

_____

Lenore Brown

Credit Manager

Top Brand Furniture Store
Hope road Kingston
Jamaica

18-01-2019

Mr Kelvin Harry
3 Hibiscus Lane
Kingston

Dear Mr Harry,

Please be informed that our accounts are showing that you have not paid your monthly instalment of $125 000 towards your purchase on 18-10-2018. Kindly pay the aforementioned amount to your account number OCT275, to avoid any inconvenience.

Yours truly,

_____

Lenore Brown

Credit Manager

Top Brand Furniture Store
Hope road Kingston
Jamaica

18-01-2019

Mr Sherry Roach
18 Railroad Street
Kingston

Dear Ms Roach,

Please be informed that our accounts are showing that you have not paid your monthly instalment of $185 000 towards your purchase on 20-10-2018. Kindly pay the aforementioned amount to your account number OCT274, to avoid any inconvenience.

Yours truly,

_____

Lenore Brown

Credit Manager

c Add TWO records of your own.

d Merge the two documents to produce letters for defaulting customers. Save the letters as 'Owing'.

e Add a new field called 'Item'.

f Fill in possible items for each customer.

g Change the amount owing for Ms Roach from $185,000 to $158,000.

h Save all changes.

Students should find this fairly straightforward. Guide any who have difficulties. Here is an example:

Title	First name	Surname	Address line 1	Address line 2	Amount	Date	Account number	Item
Mr	Conrad	Lewis	10 Wilson Avenue	Kingston	$75 000	15-10-2018	OCT256	Car
Mr	Kelvin	Harry	3 Hibiscus Lane	Kingston	$125 000	18-10-2018	OCT275	Truck
Ms	Sherry	Roach	18 Railroad Street	Kingston	$158 000	20-10-2018	OCT274	House

4 Information about the planets in the solar system is listed below in the following order: Planet, Diameter (km), Distance from the Sun (millions of km) and length of a year.

Mercury; 4,840; 58; 88 Earth days
Venus; 12,200; 108; 225 Earth days
Earth; 12,800; 150; 365 Earth days
Mars; 6,750; 228; 687 Earth days
Jupiter; 143,000; 778; 12 Earth days
Saturn; 121,000; 1,430; 29 Earth days
Uranus; 47,200; 2,870; 84 Earth days
Neptune; 44,600; 4,500; 154 Earth days

You are required to:

a Create a table with NINE rows and FOUR columns.

b Put the information above into the table under the headings in the appropriate columns.

c Centre the data in the second and third columns.

a, **b** and **c**

Planet	Diameter (km)	Distance from the Sun (millions of km)	Length of year
Mercury	4 840	58	88 Earth days
Venus	12 200	108	225 Earth days
Earth	12 800	150	365 Earth days
Mars	6 750	228	687 Earth days
Jupiter	143 000	778	12 Earth days
Saturn	121 000	1 430	29 Earth days
Uranus	47 200	2 870	84 Earth days
Neptune	44 600	4 500	154 Earth days

Research questions

1 Use the internet to research these questions.

a Name THREE word processing programs that are currently available.

b Which is the most popular word processing program on the market?

c What are the differences between a modern word processing program and desktop publishing software?

a Examples of three word processing programs:

- Microsoft Word
- WPS Office Premium
- Apache OpenOffice.

(Accept any others that students may find)

b Currently, the most popular word processing program on the market is Microsoft Word.

c The differences between a modern word processing program and desktop publishing software are:

A modern word processing program involves creation, editing and printing of text.

Desktop publishing software involves production of documents that combines text with graphics.

2 You are a new teacher at a school.

a List FIVE types of documents a teacher might create using a word processor.

b List THREE types of documents that a secretary in the school might have to create.

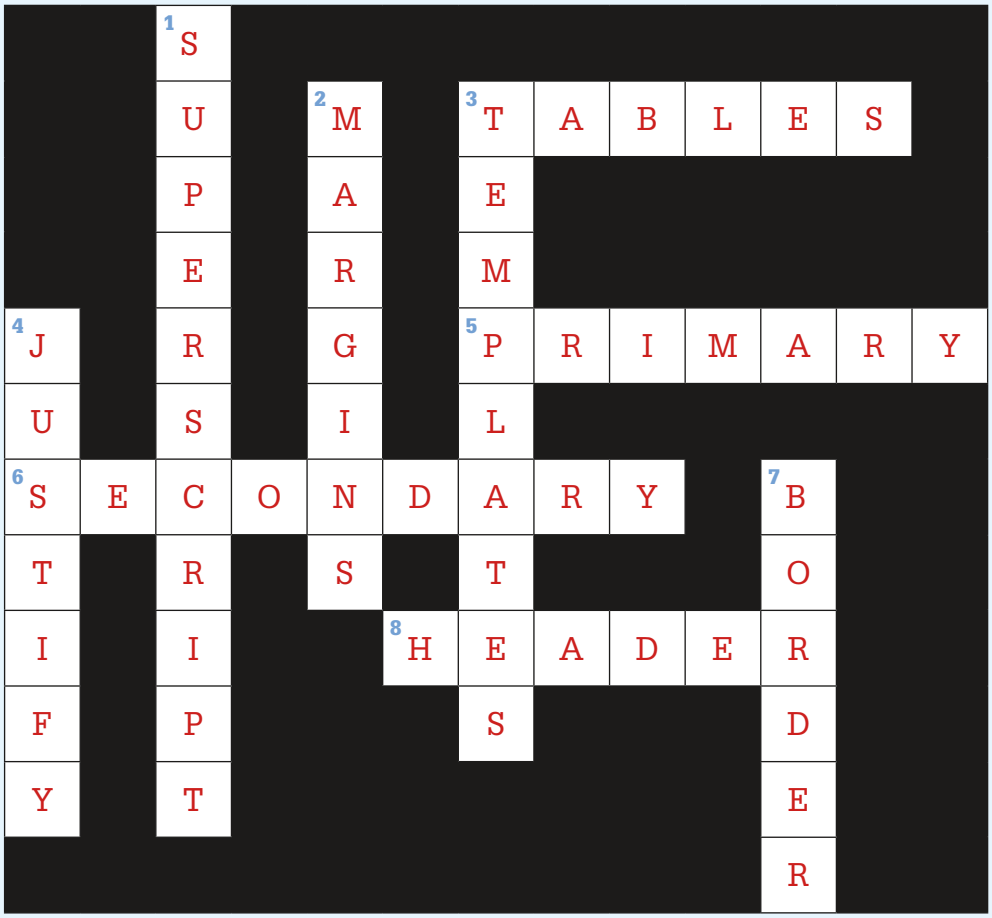
a Five types of documents that a teacher might create using a word processor:

- blank document
- blank webpage
- blank e-mail message
- general templates
- existing document.

b Three types of documents that a secretary in the school might have to create:

- minutes of a meeting
- agendas
- all communication letters.

Crossword



Across

3 Very useful for displaying formation in a way that is easy to interpret (6)

5 A file that contains the letter or another document that is meant for each recipient in a mail merge (7)

6 A file that contains the personalised information that would vary in each document, such as names and addresses of individuals in a mail merge (9)

8 The first row that contains the merge fields in the data source (6)

Down

1 A character that is raised above the normal line (11)

2 Blank spaces around the work area of a sheet of paper (7)

3 Microsoft Word offers a number of preset table designs (9)

4 The text is flush with both left and right margins (7)

7 Can give a document a more professional look, or create a visual separation between different areas of a document, making it easier to read (6)

Questions and answers 14

Fill in the blanks

1 A spreadsheet uses **formulae** to carry out operations on the numerical data.

2 The **formula** bar displays the active cell contents.

3 The **name** box identifies the active cell.

4 The intersection of a row and a column is called a **cell**.

5 A **value** is a piece of data that can be used in a calculation.

True or False?

1 When you save an Excel file, it is given the file extension '.**doc**'. **False**

2 The Title bar displays the name of the program, as well as the name of the current workbook if it has been saved. **True**

3 The rows in a spreadsheet run up and down and are numbered, while the columns run left to right and are lettered. **True**

4 Each cell in the spreadsheet can be identified by its cell reference. **True**

5 All formulae in Excel start with a plus sign (+). **False**

Multiple-choice questions

1 Which of these is a formatting feature in Excel?

a Editing and deleting contents of cells

b Inserting and deleting rows and columns

c Copying and moving data within a worksheet

d Changing the orientation of cells

2 Which default justification is applied when textual data is entered in a spreadsheet?

a Right

b Left

c Centre

d Justified

3 Which of the following represents a cell that is used in absolute cell referencing?

a A5

b $A5

c A5

d A$5

4 Which number format would you use for lining up currency symbols and decimal points?

a General

b Currency

c Number

d Accounting

5 Which of the following is true about an Excel formula?

a Begins with an @ sign

b Includes arguments

c Cannot contain brackets

d Does not follow the same order of precedence as for normal arithmetic

Short-answer questions

1 Describe what is meant by each of the following and give examples to illustrate your answers.

a Cell reference

b Label

c Value

d Formula

e Worksheet

f Workbook

a Cell reference: The column position and the row position combined (in a spreadsheet)

b Label: Can be used as a title or heading to describe an aspect of a worksheet (but not in a calculation); it can contain any string of characters (letters or numbers), but it must start with a character that does not indicate a formula or number

c Value: A piece of data that can be used in a calculation

d Formula: Instruction that tells the computer to work out the answer for the values entered, such as a mathematical equation

e Worksheet: Part of a workbook

f Workbook: A window in Excel that occupies the majority of the screen and initially contains three worksheets

2 Write down the formula you would put in a cell to do the following:

a Add cells A3, D3 and E3 together.

b Subtract B5 from D6.

c Multiply cell F1 by C5.

d Divide cell G4 by H8.

e Find 8% of cell E10.

f Add the cells B2 to B10 inclusive.

g Find the average of the cells from C3 to C10.

h Find the maximum value from the cells D3 to D40.

i Find the minimum value from the cells D3 to D40.

j Add the cells B3, C4 and D4, and then divide the total by A1.

a =A3+D3+E3

b =D6–B5

c =F1*C5

d =G4/H8

e =E10#0,08

f =SUM(B2:B10)

g =AVERAGE(C3:C10)

h =MAX(D3:D40)

i =MIN(D3:D40)

j =(B3+C4+D4)/A1

3 You need to find the total of the cells A1 to A8 inclusive and store the value in A10. Explain THREE ways in which to do this.

1 In cell A10, =Sum(A1:A8)
2 In cell A10, =A1+A2+A3+A4+A5+A6+A7+A8
3 In cell A10, click AutoSum function, then drag to highlight the A1 to A8 range.
Σ AutoSum

4 Explain the difference between relative cell referencing and absolute cell referencing.

Relative cell referencing refers to copying a formula to other cell(s) in a row or column and let Excel change the formula, relative to the position of the cell(s).
Absolute cell referencing refers to the moving or copying of a formula but keeping the cell reference in the formula fixed.

5 List the guidelines that Excel uses when sorting text for blank cells, numbers used with text and hidden rows.

Most spreadsheet packages use these guidelines to sort a list of data:
- Rows with blank cells are placed at the bottom of the sorted list.
- Hidden rows are not moved.
- Numbers that are used as text are sorted before text alone.

6 Explain the meaning of the following error messages:

a #####
b #NAME?
c #REF!
d CIRCULAR

a ##### This means that the column is not wide enough to display the value.
b #NAME? Excel does not recognise text in a formula. Check the spelling of your function.
c #REF! This appears when Excel encounters an invalid cell reference, such as when you delete a cell referred to in a formula, or paste cells over the cells referred to in a formula.
d CIRCULAR The formula is referencing itself. The cell reference containing the formula is also part of the formula.

Worksheet questions

1 Create the spreadsheet shown in Figure 14.51.

a Insert a formula in D4 to calculate the area of the square.

b Insert a formula in D7 to calculate the area of the rectangle.

c Insert a formula in D10 to calculate the area of the circle.

d Insert a formula in D13 to calculate the area of the triangle.

	A	B	C	D
1				Area Generator
2				
3	Square	Length of side		Area
4		15		
5				
6	Rectangle	Length	Breadth	Area
7		22	13	
8				
9	Circle	Radius		Area
10		8		
11				
12	Triangle	Base	Altitude	Area
13		14	19	

▲ Figure 14.51

a to **d**
Check that students are able to create the spreadsheet. Offer guidance as needed.

2 The worksheet in Figure 14.52 shows the names and starting balance of some customers of the People's Bank. Each customer is paid 3% interest on their starting balance. Create the worksheet shown in Figure 14.52 and complete the following:

a Calculate the interest that each customer earns.

b Calculate the 'Year End Balance' of each customer.

c Format the cells with currency and two decimal places.

d Change the starting balance for Larry Adams to 54600.

e Insert the details for the new customer, Jerry Ben, who deposited $15,674 between customers Birbal and Balfour.

			The People's Bank			
Surname	First Name	Starting Balance	Interest Rate		Interest Earned	Year End Balance
Adams	Larry	45600	3%			
Balfour	Marie	76259				
Birbal	Varun	58648				
Chin-Fat	Gary	125648				
Douglas	Sheena	54782				
Henry	Ria	35489				
Jackson	Penny	75146				
Mason	Joseph	12467				

▲ Figure 14.52

a to **e**
Check that students are able to create the worksheet as shown and then follow the instructions in the question correctly.

Research questions

1 Conduct research to find out how a spreadsheet can be used to assist in teaching these subjects:

- **a** Mathematics
- **b** Agricultural Science
- **c** Business Studies

Students' research will vary regarding the ways in which teachers can use a spreadsheet to teach the different subjects.

a Mathematics: Spreadsheets can be used, for example, for solving equations, trigonometric functions, Pascal's triangle and binomial expansion, linear transformations, optimisations and linear programming.

b Agricultural Science: Spreadsheets can be used, for example, for farm planning, crop record keeping, animal and/or dairy operations.

c Business Studies: Spreadsheets can be used, for example, to produce graphs and charts, for sorting and storing data and to create budgets.

2 You are required to gives examples to show how the spreadsheet package will be used.

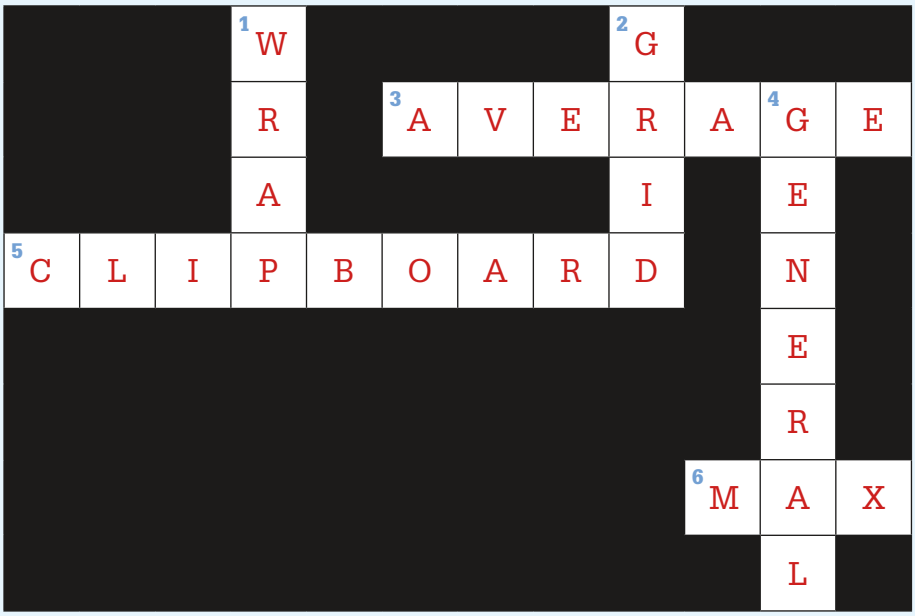
Students' own answers. This question offers a good opportunity to check that they really understand how to use spreadsheets.

3 Do research on the internet to explore low-fat menus and various exercise programmes.

- **a** Compare calories/kilojoules from a healthy home-cooked meal to a fast-food meal.
- **b** Create a spreadsheet to calculate the total calories/kilojoules consumed and the total calories/kilojoules with calories burned.

Students' research will vary.

Crossword



Across

3 A function that allows you to find the mean of a row or column of cells (7)

5 The location data is held when you Copy, and then use the Paste command in Excel (9)

6 A function that can be used to find the highest value in a row or column (3)

Down

1 An option that allows labels consisting of more than one word and exceeding the width of a cell, to move to another line in the same cell (4)

2 A type of line that makes it easier to read the values from a chart (4)

4 When formatting numbers, you can use this if you do not want a specific number format (7)

Questions and answers 15

Fill in the blanks

1 A **database** is a collection of related data about a particular subject that is stored together.

2 A **table** is the basic unit of a database.

3 A **field** is an area reserved for each piece of individual data.

4 A **table** is a group of related fields relating to one person, place or thing.

5 A **query** is a method of storing and answering questions about information in a database.

True or False?

1 You can only have one table in a database. **False**

2 You can generate a report if you want to display information in a table or query. **True**

3 You can build a query to extract information from only one table at a time to answer a question. **False**

4 A primary key is a unique record identifier. **True**

5 A primary key can allow you to run a query faster. **True**

Multiple-choice questions

1 Which of the following types of information can be stored in an electronic database?

a Text
b Alphanumeric
c Date
d All of these

2 An organised collection of related records is a:

a cell.
b field.
c table.
d record.

3 A group of related fields for a single person is a:

a record.
b query.
c table.
d report.

4 In a record containing these fields, FIRSTNAME, SURNAME, DOB, PHONENO, which of the following would be the data type of DOB?

a Number
b Text
c Date/time
d None of these

5 A primary key can:

a speed up data retrieval.
b sort records according to values in fields.
c let you establish relationships between tables.
d do all of the above.

Short-answer questions

1 Explain how an electronic database can help you to find information.

2 The database table DENTAL PATIENTS has the following fields:

Field Name	Data Type	Field Sizes
PatientNo		
FirstName		
Surname		
DateofLastVisit		
DOB		
Address		
PhoneNo		
NoofFillings		
NoofExtractions		

Table 15.4 A database table

a Copy and fill in the Table 15.4 with suitable data types and field sizes for the fields listed.

b Describe TWO queries that you may want to perform on the above database.

c List TWO additional fields that you could add to the above database table.

d Which field in this database table would you use as the primary key?

Students' answers will vary.

a Were students able to copy and fill in the Table 15.4 with suitable data types and field sizes for the fields listed?

b Did they describe two queries that they might want to perform on the database?

c Did they list two additional fields that they could add to the database table?

d Were students able to name which field in the database table they would use as the primary key?

3 A Jamaican computer shop keeps the details of its stock in a computer database (see Table 15.5). Some of the records are shown in Table 15.5.

a Create a database named 'Computer Stock'.

b Create a table called 'Laptop Inventory' using suitable field names and datatypes to store the information.

c Enter all the data shown in the table.

d Create a form.

e Enter THREE records of your own using the form.

f Sort the table in ascending order of quantity.

g List all the information about computers that contain a 512 GB hard disk.

h List those computers that have a 39.6 cm monitor and 512 GB hard disk.

Brand	Quantity	Processor	Monitor size (cm)	RAM	Hard disk	Price
Super	12	5.0 GHz	39.6	4 GB	256 GB	60.500
Powermax	20	5.6 GHz	39.6	8 GB	512 GB	95,000
Professional	23	5.3 GHz	35.6	4 GB	128 GB	45,000
Kuta	30	5.3 GHz	39.6	4 GB	512 GB	75,000
Maxima	10	5.0 GHz	35.6	4 GB	256 GB	55,000
Eagle	15	1.66 GHz	39.6	4 GB	256 GB	43,000
Apex	11	1.66 GHz	35.6	4 GB	512 GB	48,900

Table 15.5 Computer database of in-store stock

a Did students create a database named 'Computer Stock'?

b Did students create a table called 'Laptop Inventory' using suitable field names and datatypes to store the information?

c Did students enter all the data shown in the table?

d Were students able to create a form?

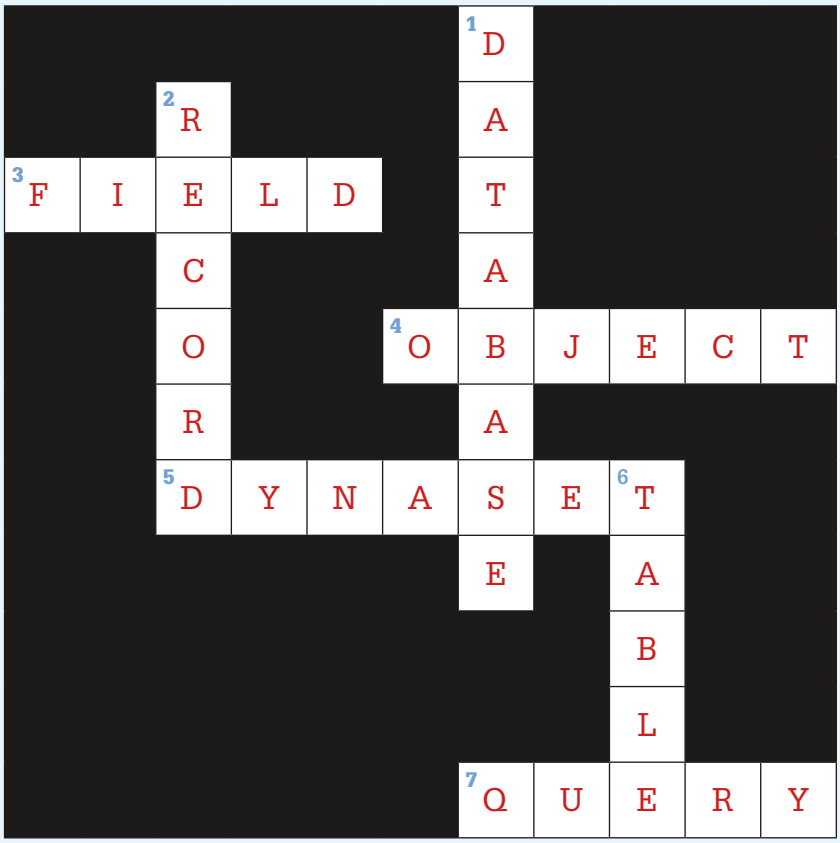
e Did students enter three records of their own using the form?

f Were students able to sort the table in ascending order of quantity correctly? (Maxima, Apex, Super, Eagle, Powermax, Professional, Kuta)

g Did students list all the information about computers that contain a 512 GB hard disk correctly? (Powermax, Kuta, Apex)

h Did students list those computers that have a 39.6 cm monitor and 512 GB hard disk correctly? (Powermax, Kuta)

Crossword



Across

3 An area reserved for each piece of individual data or data item (5)

4 An option you can select and manipulate in a database (6)

5 A group of records that answers a query (7)

7 A means of storing and answering questions about information in a database (5)

Down

1 A collection of related data about a particular subject (person, place or thing) (8)

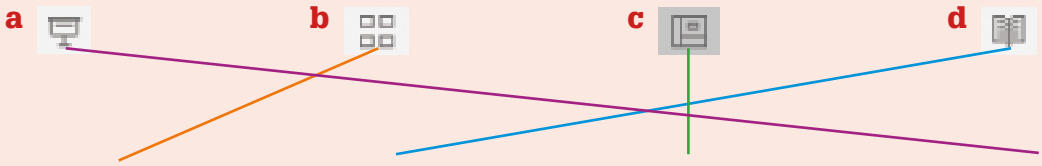
2 A group of related fields pertaining to one person, place or thing (6)

6 The basic unit of a database (5)

Questions and answers 16

Matching questions

Match each icon to its correct view from below.



1 Slide Sorter view **2** Reading view **3** Normal view **4** Slide Show view

True or False?

1. PowerPoint does not allow you to include sound and animation in your presentation. **False**
2. The blank presentation start-up option of PowerPoint gives you a blank page with no background or colour scheme. **True**
3. The New Slide dialogue box consists of a number of different layouts. **True**
4. There are four panes of development in the Normal view of PowerPoint. **False**
5. You cannot change the colour and background of a slide once you have already selected them. **False**
6. An animated effect can be placed on an object by selecting either Preset or Custom Animation. **False**
7. Both text and graphics can be animated. **True**
8. You can preview your animations after making changes. **True**

Multiple-choice questions

1 Which of the following are start-up options?

a Open an existing presentation
b Open a blank presentation
c Design Template
d All of the above

2 Moving slides can take place in which view?

a Normal view
b Slide Sorter view
c Outline view
d All of these

3 To animate an object you must choose:

a Slide show from the File tab.
b Animation Effects from the Insert tab.
c Custom animation from the Slide Show tab.
d Animation from the Animations tab.

4 Which of the following is not an effective guideline to follow when creating a presentation?

a Use consistent animations
b Use as many graphics as possible
c Limit the number of colours
d Be mindful of the sound quality

Short-answer questions

1 What is a placeholder? Explain its use in PowerPoint.

Placeholders are pre-selected boxes with dotted borders that hold titles and text or objects, such as charts, tables and pictures, within the slide.

2 What is a thumbnail?

Thumbnails are miniature views of a slide, which allows you to move them around.

3 List FIVE guidelines for effective presentation.

Guidelines for effective presenations:

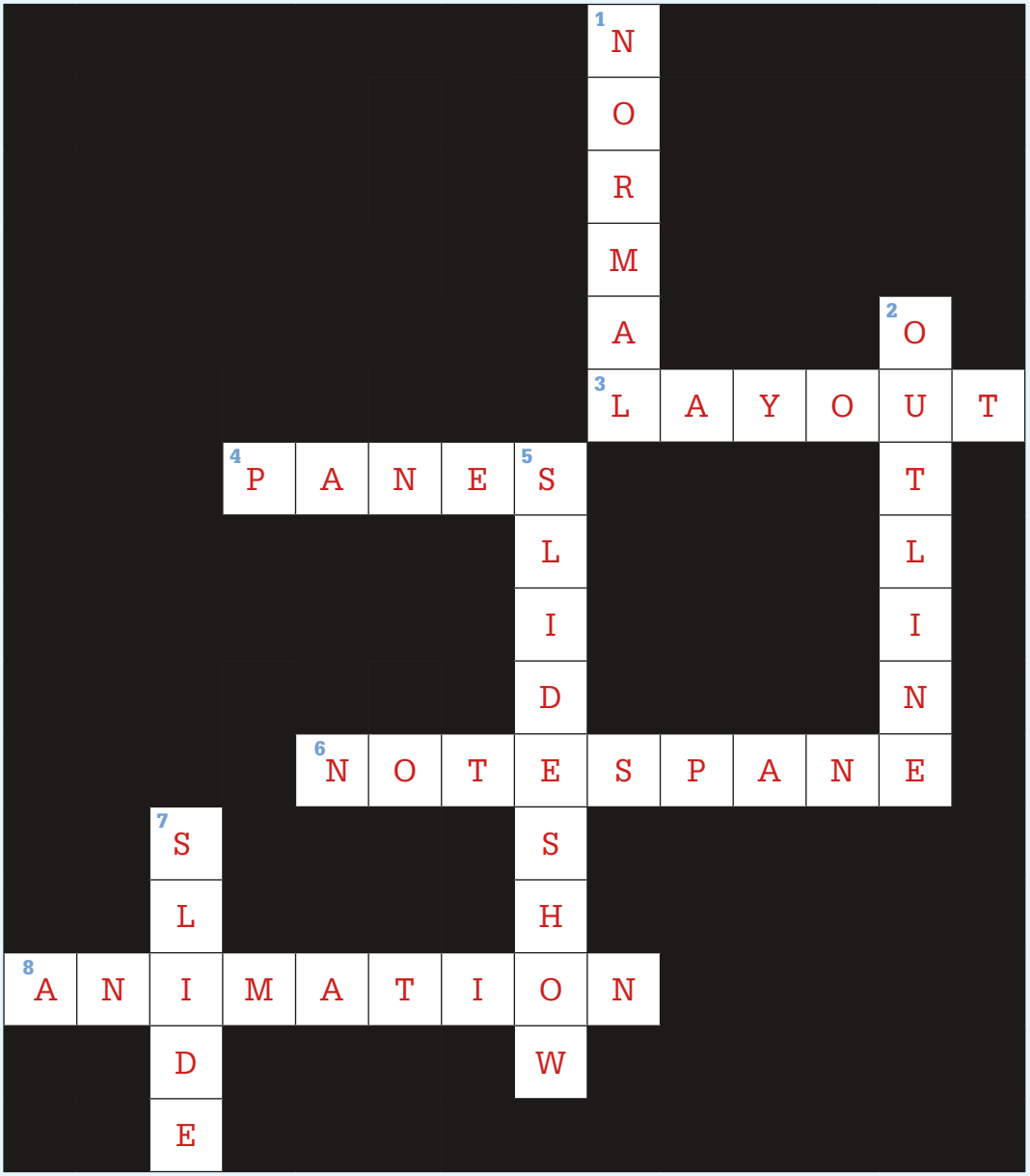
- Plan carefully what you want to say and do your research.
- Practise and time your presentation.
- Speak clearly and enunciate your words. Do not rush your presentation by speaking too quickly, as your audience will then struggle to hear and understand you.
- Know your audience. Are you presenting to adults or children? Your audience will indicate the type of language (simple or more complex) that you will need to use.
- Try to limit the number of words on a line. Generally, you should have six to eight words per line and six to eight lines on a slide. As you place more words on a line, the text becomes smaller and your audience may not be able to see the information.
- Try to avoid long sentences, as they may become difficult for your audience to read.
- Pay careful attention to your use of font sizes, as they are important. Font sizes should generally range from 25 to 48 points. Larger font sizes in a presentation usually indicate more important information.
- Avoid using fancy fonts, as they can be difficult to read.
- Make sure that the text colour contrasts with the background. Text colours that are very similar to the background colours are difficult to see and read.
- Avoid writing words with all capital letters, as they are difficult to read.
- Avoid using abbreviations and acronyms unless you explain them somewhere in your presentation, as the audience may not understand what they mean.
- Use animations and transitions only if they enhance your presentation, as they can be distracting.
- Avoid using too many animations and transitions, as they can confuse and distract your audience.
- Make sure that any animations and transitions are consistent, as many different types of animations on one slide can be distracting.
- Add sounds only if they enhance and improve the quality of your presentation.
- Keep in mind that the sound you hear on your laptop or desktop may not be loud or clear enough to be heard by an audience in a large room.
- Make sure that the graphics and clip art enhance and complement the text, and do not overwhelm it.
- Check that the graphics and clip art relate to both the topic being presented and the information on that particular slide.
- Try to use no more than two graphics per slide.
- Use design templates.
- Make sure your slides have standardised colours and styles.
- Make sure that slides include only essential information.
- Use contrasting colours on slides.
- Limit the number of slides in your presentation, because too many slides can confuse your audience.

(Any five)

4 List THREE guidelines for including sound, animation and transitions in presentations.

1. Add sounds only if they enhance and improve the quality of your presentation.
2. Avoid using too many animations and transitions, as they can confuse and distract your audience.
3. Use animations and transitions only if they enhance your presentation, as they can be distracting.

Crossword



Across

3 This refers to the format of a slide (6)

4 Normal view has three of these (5)

6 To assist the presenter when making a presentation (two words) (9)

8 Do this to objects in a slide to make your presentation more interesting (9)

Down

1 This is the default view (6)

2 The view that allows you to develop text (7)

5 An on-screen production of your presentation (two words) (9)

7 This view allows you to develop slides for your presentation (5)

Questions and answers 17

Multiple-choice questions

1 From which tabs can you adjust the margins and page orientation?

a Insert
b File
c Page Design
d View

2 From which tabs can you change the settings of the grid guides?

a Insert
b File
c Home
d Page Design

3 The following icon is known as the: 

a autoflow icon.
b overflow icon.
c text link icon.
d text box icon.

4 The following icon is known as the: 

a autoflow icon.
b text link icon.
c text box icon.
d picture frame icon.

5 In order to add the following text to a frame 'Continued from page…' you need to:

a right click and choose Format Text Box.
b select Format from the Font menu.
c choose 'Continued from page…' from the Edit menu.
d type it in at the top of the text frame.

6 Publisher organises information in:

a pictures.
b frames.
c jobs.
d texts.

7 Which of the following can be produced by desktop publishing software?

a Magazines
b Menus
c Books
d All of these

8 Which of the following is a type of frame?

a Text box
b Object box
c Picture Placeholder box
d All of the above

9 Which of the following is the easiest way of creating a publication using Microsoft Publisher?

a Featured publication
b Publication for print
c Publication from scratch
d Blank publication

True or False?

1 A grid guide shows the margins in a publication. **False**

2 An overflow area holds text that cannot fit into a text frame. **True**

3 You cannot adjust the margins by changing the margin guides. **False**

4 Borders can only be used to frame a text frame. **False**

5 You can import text from another application such as Microsoft Word into Microsoft Publisher. **True**

6 You cannot delete or add a page once a publication type is selected. **False**

7 Publisher allows you to add 'Continued on page…' when two frames are linked. **True**

8 Connecting two frames allows you to see the overflow text. **True**

9 A frame can hold only text. **False**

10 The zoom controls allow you to adjust the viewing size of your publication. **True**

11 A text box is a type of frame. **True**

12 You must have a printer that prints on both sides of the paper in order to print a postcard that contains data on both sides. **True**

13 You cannot change the size of a frame, or move a frame. **False**

14 You cannot produce a book using DTP. **False**

15 The actual layout of your publication cannot be changed. **True**

16 You can include your personal details in your publication by using the personal information dialogue box. **True**

Short-answer questions

1 What does DTP stand for?

DTP stands for desktop publishing.

2 Explain what a design set is.

A design set is a set of different publication types with the same overall design.

3 List TWO hardware devices that can be used to incorporate drawings and photographs into a publication.

Two hardware devices that can be used to incorporate drawings and photographs into a publication are:

- a scanner
- a digital camera.

4 List THREE well-known DTP software packages.

Three well-known DTP software packages are: Microsoft Publisher, iStudio Publisher and Adobe FrameMaker.

5 Explain TWO limitations of using Microsoft Word or another similar word processor to produce DTP publications.

Two examples of limitations of using Microsoft Word or another similar word processor to produce DTP publications:

- Word does not allow for precision with images.
- DTP is inexpensive so it is easy for the average person to produce poorly designed publications.

(Accept other limitations that students may think of.)

6 List EIGHT publications that can be produced using DTP.

Publications that can be produced using DTP:

- flyers
- invitations
- agenda
- magazines
- menus
- calling cards
- pamphlets
- newsletters
- books
- newspapers
- postcards
- brochures.

(Any eight. Accept other valid ideas that students may think of.)

7 List THREE options for fitting text into a frame and explain in what context each option would work.

Three options for fitting text into a frame and in what context each option would work:

- Increase the size of the frame. Dragging the selection handles around the frame increases its size. However, increasing the size of the frame may not be possible, as there may not be enough room on the page to expand the frame and bring in all the text.
- Decrease the size of the text. This may work, but in many cases may not be desirable, as the text size may become too small, which would make the text difficult to read.
- Continue the article in another frame. This option means that you have to connect one frame to another, which would allow the text to flow from one frame into the next. The frames can be on the same page or on a different page.

8 Explain the difference between margin guides and grid guides.

Margin guides are lines that tell you where the margins are located.
Grid guides help with the layout of your columns and rows.

9 Your neighbour has decided to sell his puppies and he has pasted flyers all over the neighbourhood. A copy of the flyer he produced is shown below. Identify FOUR features that can be used to improve the flyer. Redesign the flyer using Microsoft Publisher.

Pups for Sale
3 weeks old, brown and black puppies, vaccinated,
pure breed German Shepherd
Price: $400.00
Phone contact: Jason Smith 664-7622

Students' redesigned flyers will vary. Check that all students are able to use Microsoft Publisher with an understanding of its features.

Create these products

1 A sign for a classroom door that says 'Class in progress: Do not disturb'

2 A booklet that describes the computer lab rules

3 A birthday card

4 A letterhead for a video club

5 A school newsletter

6 A business card for your lawn-cutting small business

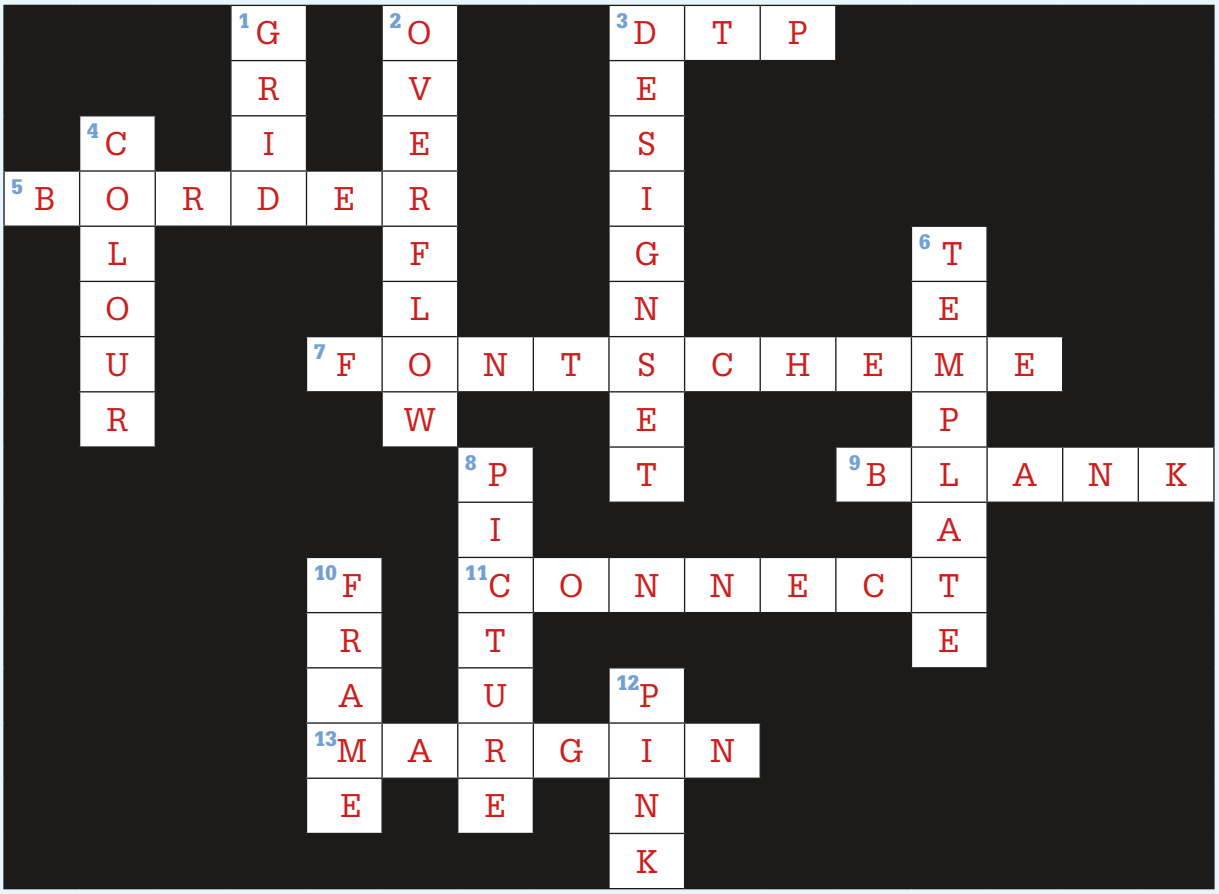
7 A poster for your class play

1 to **7**

Students' products will vary.

For each product, check that they have understood how to create it and knew which tools to use on DTP.

Crossword



Across

3 The production of professionally-produced publications (3)

5 Add this around a text frame or page to make a publication look finished (6)

7 Specifies a set of fonts to be used in your publication (two words) (10)

9 A publication can be designed by starting with a template or a _____ publication (5)

11 In order to continue an article in another frame, we have to _____ the frames (7)

13 A guide that assists in laying out a publication (6)

Down

1 A guide that can indicate columns or rows (4)

2 An area where text that cannot be seen is placed (8)

3 A set of different types of publications using the same design (two words) (9)

4 A scheme that specifies a set of colours to be used in a publication (6)

6 A pre-formatted design layout of a page or document (8)

8 A frame that can hold a graphic (7)

10 Holds a block of text or a picture (5)

12 Guides are either _____ or blue (4)

Questions and answers 18

Fill in the blanks

1 A **website** is a collection of related webpages (linked with hyperlinks), which resides in a web server.

2 Webpages are written in **HTML** code.

3 **Hypertext markup language** is the language that web browsers use to understand how to display the contents of a webpage.

4 Websites are accessible to users via the **World Wide Web (WWW)**.

5 Notepad is a basic **text editor** program that you can use to create simple documents.

6 Webpages can be created in Notepad by entering HTML code and saving the file as an **.html** file.

7 An HTML file is a text file containing markup **tags (commands)**.

8 **<HTML>** tells your browser that this is the start of an HTML document.

9 A **wireframe** is a basic sketch of a webpage.

10 A service that allows organisations and individuals to post a website or webpage onto the internet is known as **web hosting**.

True or False?

1 Webpages are written in HTML. **True**

2 HTML tags are case sensitive. **False**

3 A server-based site is on the server and not on your computer. **True**

4 Webpages can be created using Excel. **True**

5 All HTML tags are surrounded by **<** and **>**. **True**

6 The text between the <HEAD> tag and the </HEAD> tag is displayed in the browser window. **False**

7 Word's built-in HTML translator can automatically convert any text, graphics or hyperlinks that you insert into your Word document into a web-compatible format. **True**

8 Microsoft Expression Web is a website authoring application software. **True**

9 The SRC tag in HTML inserts an image into a webpage. **True**

10 The attribution BGCOLOR is used with the BODY tag to change the background colour of a webpage. **True**

Multiple-choice questions

1 A website is a collection of:

a sound files.
b animation files.
c graphic images.
d webpages.

2 Which of the following is NOT a major step in website publishing?

a Planning
b Designing
c Executing
d Hosting

3 Webpages can be created using:

a application software.
b an editor program such as Notepad.
c specialist web creation software.
d all of the above.

4 Websites can provide a convenient way of:

a advertising.
b purchasing items.
c paying bills.
d all of these.

5 The design of a website depends on:

a the amount of memory space available.
b purpose and intended users of the site.
c the processing speed of your computer.
d all of the above.

Short-answer questions

1 Define the terms 'website' and 'webpage'.

A **website** is a collection of webpages.

A **webpage** is a document written using HTML and is connected to the World Wide Web (WWW).

2 List the FIVE major steps in website publishing.

Five major steps in website publishing are:

- planning
- designing
- creating
- evaluation and testing
- hosting and maintaining.

3 Describe how you would go about building a webpage?

To build a website: Plan the content, think about the design and set up the template, create the content, evaluate the content and then test it, host the site and make sure you maintain it.

4 Define the term 'wireframe' and explain its importance in building a website.

A **wireframe**/storyboard can show the direction of movement through the website by laying out the different buttons and links on each page. It is important for showing the structure, mood and organisation of the website.

5 List FIVE basic components of a webpage.

Five basic components of a webpage are: the header, the content, the footer and site navigation.

6 List FOUR different categories of software that can be used to create webpages.

Four categories of software that can be used to create webpages are:

- A wireframe/storyboard can show the direction of movement through the website by laying out the different buttons and links on each page. It is important for showing the structure, mood and organisation of the website.
- Application software (for example, Microsoft Word), a text editor program such as Notepad.
- Specialist web creation programs (for example, Adobe Dreamweaver).
- Website builders (for example, siteBuilder).

7 Explain the term 'web hosting'.

Web hosting is posting a website or webpage on the internet for others to see.

8 Explain the purpose of maintaining a site.

Maintaining a website prevents it from becoming outdated, which keeps customers coming back to your website.

Research questions

1 Make a list of FIVE of the most used website builder software. Place this information on a table under the following headings:

a Name of software

b Cost

c Features offered

d Support offered

2 Make a list of FIVE of the top web hosting companies and their cost for their service.

3 Your friends have created a website using HTML. They would like to make the site available to everyone on the internet. Explain to your friends what they need to do to publish their website onto the internet.

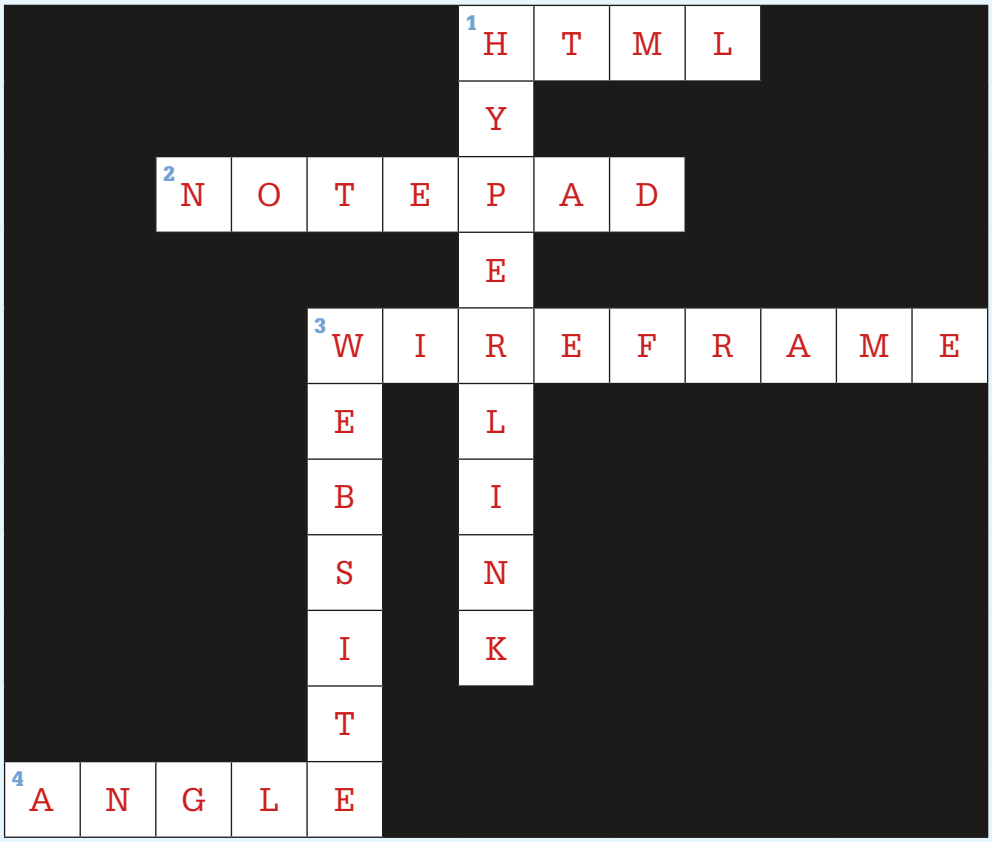
Students' research will vary.

1 Did students create a table as asked, with the correct headings?
Were they able to find and list five of the most used website builders and add the required information under each heading?

2 Were students able to find and list five of the top web hosting companies and the costs for their services?

3 Were students able to explain, clearly and concisely, how to publish a website onto the internet?

Crossword



Across

1 The extension that must be used to save a Word document as a webpage (4)

2 A basic text editor program that you can use to create webpages (7)

3 A simplistic sketch and/or layout of a webpage (9)

4 A type of brackets that surround HTML tags (5)

Down

1 Allows you to move to another point within a document or a website by clicking on a word or image (9)

3 A collection of related webpages linked together with hyperlinks and resides in a Webserver (7)