Interact with Information Technology 1

Questions and answers 1

Copy and fill in the blanks questions

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

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 the part of the computer known as the **CPU**.

6 The **control unit** 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 **ALU** performs all the arithmetic and logic functions in a computer.

9 **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 questions

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

2 The CPU is the brain of the computer. **True**

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

4 The control unit sends data from the memory to the ALU for processing. **True**

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

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

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

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

9 Technology has improved communities by providing better communication systems. **True**

Multiple-choice questions

Choose the **best** answer to each question.

1 Which is not an example of a peripheral device?

a Keyboard **b** Mouse

c Register **d** Speakers

2 A program is a:

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

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

3 Which is not found in the CPU?

a ALU **b** Control unit

c Memory **d Printer**

4 The ALU processes data and stores it in:

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

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

5 Which one of the following is not a function of the control unit?

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

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

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

a megabytes. **b gigahertz.**

c gigabytes. **d** terabytes.

7 Registers are used to store data and instructions that:

a are needed over a long period of time.

b are needed immediately and frequently.

c are needed at start up.

d are needed to hold the program that is being used.

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

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

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

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

a Keeping track of student progress **b** Greater collaboration

c Entertainment **d** Enhanced productivity

Short-answer questions

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

Computer: a programmable electronic device that processes data following a set of instructions; a computer is a single device to which peripherals can be attached.

Computer system: refers to 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 Define the terms 'hardware' and 'software'.

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

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

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

Data: all the raw facts and figures that a computer processes; for example, data could be a list of the favourite colour of 11 students: red, blue, yellow, blue, green, blue, red, yellow, blue, red, blue.

Information is organised data that brings out meaning and is produced when data is processed to give meaning. For example, if you were to count and tabulate the number of each colour of the data, then you would get information such as: *The most popular colour is blue.* (Five students said 'blue'.) and *The least favourite colour in the list is green.* (Only one student said 'green'.)

4 Draw a diagram showing the three stages of processing.

5 Using an example, explain the data-processing cycle.

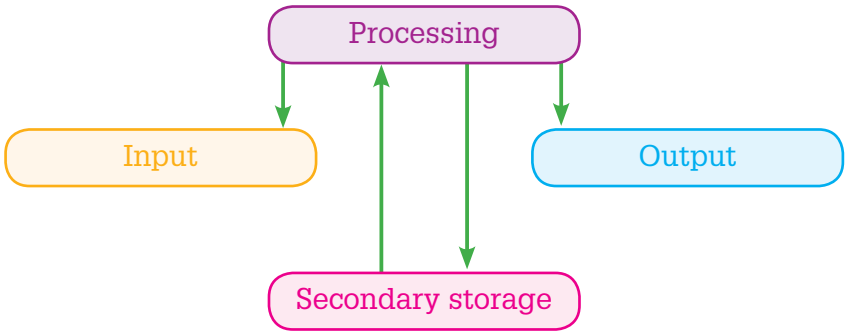
A teacher needs to find the average of a student's Mathematics and English scores.

Input is typing the two scores on 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.

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



7 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 arithmetic and logic unit (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.

8 Explain the purpose of the following devices:

a Input device

b Output device

c Main memory

a **Input device:** used to carry data or instructions from the user to the computer.
b **Output device:** converts results from the computer into a form that the user can understand; it carries results or information from the computer to the user; an example is a monitor.
c **Main memory:** holds data and instructions that the computer is processing at the time.

9 **a** Explain the difference between application software and system software.

b Give two examples of application software and one example of system software.

a **Application software** consists of programs needed by the user to carry out specific tasks or solve problems; for example, software to calculate student averages.
System software is software that is needed to run and maintain the functionality of a computer and its parts.
b **Application software** examples: Microsoft Word and games on the computer.
System software examples: the operating system or software to run a printer. (Any one)

10 State four reasons why computers are used.

- Computers are more accurate and faster than humans.
- They can store a lot of data in a small space.
- They can work for long periods without taking a break for weekends and holidays.
- They can connect us to a vast amount of information through the internet, allowing us to communicate easily with people around the world.

11 Technology has permeated almost every aspect of our daily lives.

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

- Family members can stay in touch using cell phone text and calls.
- Adults can shop and pay bills online from their homes; if proper systems are in place, this is safer and less time-consuming than leaving home to pay bills.
- Homeowners can have devices installed, such as smart switches, plug adapters or timers, which they can set so that the power switches off after a certain time without them even being in the room. This helps to save electricity.

b List three ways technology has enhanced productivity at the workplace.

- Goods can be produced faster through the use of computer-aided design (CAD) and manufacturing.
- The use of the internet may help to bring in more sales.
- The use of the internet may also enable faster distribution and better after-sales service.

12 Technology has improved education and learning processes.

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

Teachers can use technology to assist them by:

- using the internet to research topics or subjects to be taught and finding topic-related lesson plans, exams and videos
- using a computer to save time by emailing students' homework and receiving their responses
- using a computer to provide students with immediate exam feedback, which helps them to focus on and correct incorrect answers while the information is still fresh in their minds
- helping to motivate students by suggesting activities involving technology, such as playing subject-related video games or using other visual aids.

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

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

An example of how a student can use technology to assist with studies:
Use social media to link up with a study group in which students ask and answer one another's difficult questions. (There are other possible answers; accept any that are sensible.)

Research questions

1 Using the internet to conduct research, 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 Names of three manufacturers of computer processors: Check Google or another search engine for CPU manufacturers, for example: Intel, AMD, Qualcomm, NVIDIA, IBM, Samsung, Motorola, Hewlett-Packard (*hp*), and so on.
b Students should draw a two-column table with the following headings: Manufacturer; Latest processor. Check the research results to see that students are on the right track.

2 Use the internet to conduct research to determine the negative impacts of computers in:

a the school.

b the home.

c the workplace.

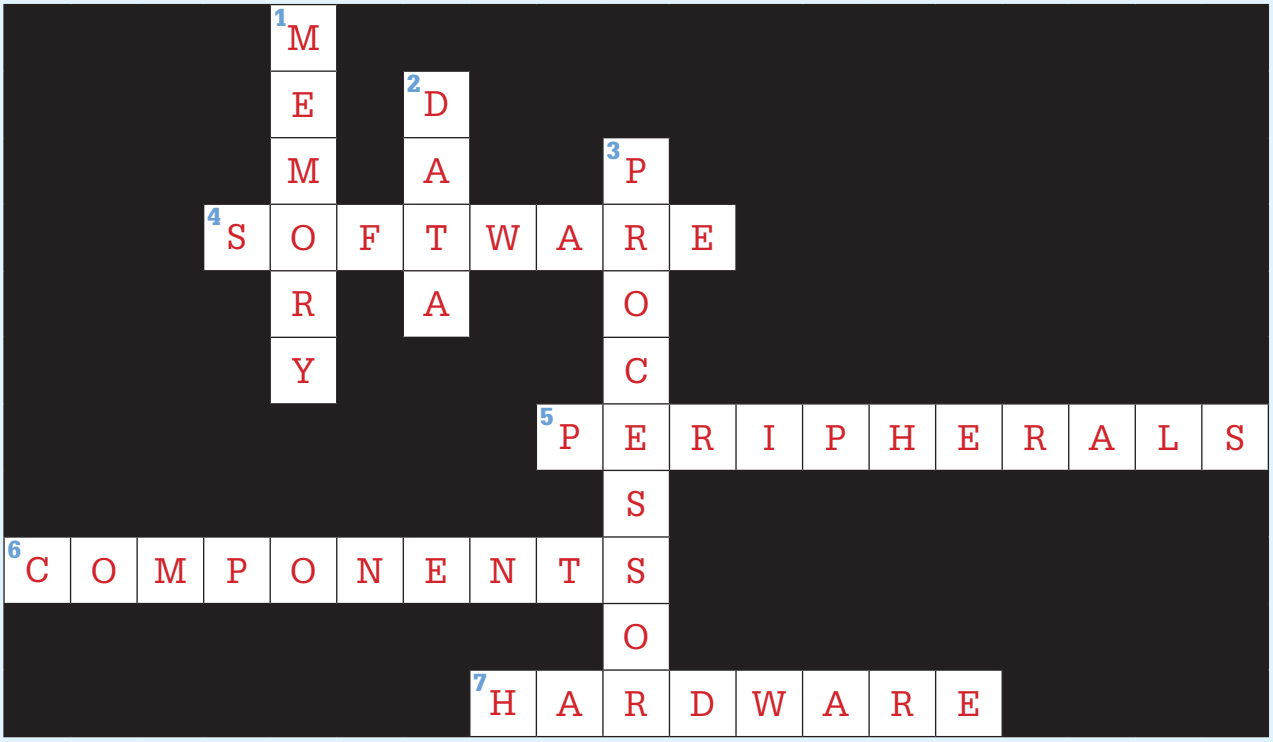
d the community.

Negative impact of computers: Check Google and YouTube videos.
Some points are listed below. (There are other possible answers; accept any that are sensible.)
a School: Students waste time using computers to play games and to go on social media. It is not easy to monitor students, so they may stray and visit unsuitable sites.
b Home: Students waste time playing computer games instead of concentrating on homework, assigned duties or helping around the house. Parents may also spend hours on the internet, so neglecting family members and household chores.
c Workplace: Unauthorised viewing of a person's confidential files may occur. The spread of viruses could occur.
d Community: Increased theft of computers from homes, schools and businesses by criminals. Reduced interpersonal relationships, as many people choose to stay indoors on their PCs instead of meeting and spending time with others in the community.

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

Tips for collecting data to determine for what purposes students use their cell phone – for example:
- Find out from 15 or more students if they use a cell phone to play games, check social media, or to help with studies such as internet research and reading emails from teachers. (Any other suggestions may also be used.)
- Tally the responses for each reason, then create a table or graph.
- Analyse the results and make some conclusions, for example: *Cell phones in this school are used mostly for ….*

Crossword



Across

4 A set of instructions that a computer needs to carry out its tasks

5 Hardware devices that are not essential to a computer's function

6 The internal hardware devices that make up a computer and ensure its functionality

7 All the parts of a computer system that you can see and touch

Down

1 The part that holds data and instructions that the computer is processing at the time

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

3 Sometimes referred to as the 'brain' of the computer

STEM project

Your mother has given your grandmother a computer as a gift. Your grandmother lives in a country outside of the Caribbean. She is a retired typist and is familiar with an electronic typewriter, but she is not very familiar with computers. However, she is looking forward to learning about them. Your mother has asked you to write simple step-by step guidelines to help your grandmother understand the parts of a computer and their functions, to gently get her started in its use. You decide to consult with your classmates to get help in writing these guidelines.

1. Write a precise statement on what the manual should do for your grandmother.
2. Decide on the content and format of the manual. What process did you and your classmates follow to decide on the content and format? Write a brief outline of this process.
3. Produce the manual and get an elderly non-computer-using adult to use it.
4. Were there any problems in the test use of the manual? How do you plan to improve the manual as a result?

Hints

1. How is a computer similar to an electronic typewriter? Do research on this.
2. What are the main features of a manual? Write up a table of contents.
3. A large, well-labelled diagram can be very effective in showing the parts of a computer.

Students' will have their own answers. Before they start, remind them to read the hints that have been provided.

1. Make sure students have thought through and written a precise statement on what the manual should do for the grandmother.
2. Look at and assess students' content and format for the manual. Is it well-thought through? Did students follow a suitable and logical process? Check students' outlines for sense.
3. The manual should be clear enough for a non-computer-user to be able to follow.
4. Discuss problems that students might have had, or suggestions of ways to make the manual clearer – a class discussion would help here.

Questions and answers 2

Copy and fill in the blanks questions

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 computer that has less processing power than a full-sized laptop.

3 Data can be entered through the 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 gaming **console** is a highly specialised desktop computer used to play video games.

6 A **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 questions

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

2 Notebooks are usually 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 a time. **True**

5 An embedded computer is housed on a single circuit 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 common computers today are mainframe computers. **False**

Multiple-choice questions

Choose the **best** answer to each question.

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 the period:

a 1933–1945. **b** 1945–1956.

c 1956–1963. **d 1964–1970.**

5 Which generation of computers used very large-scale integration (VLSI)?

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 touchscreen.

c a digitising tablet. **d all of the above.**

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 computers **b** Desktop computers

c Wearable computers **d Embedded computers**

Short-answer questions

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

- PCs come in many different shapes, sizes and colours.
- They are designed to be used by one person at a time.
- They are small computers ranging in size from those that fit on an office desk to those that can fit into a jacket pocket.
- A PC consists of a system unit, a keyboard, a mouse and a display screen; other devices (such as speakers) can be added.
- They are designed to perform the input, control, arithmetic-logic, output and storage functions.

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

- A **supercomputer** is larger, faster, more powerful and more expensive than a **mainframe computer**.
- A **mainframe computer** handles large amounts of input, processes many transactions or requests from thousands of users attached to it, and produces high-volume output; it is used in large organisations such as banks or insurance companies.
- A **supercomputer** does many very fast and complex calculations, for example, in scientific simulations or research and development in areas such as energy, space exploration, medicine and industry.

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
- The bank may have thousands of employees working at several branches, with clients all over the country who need to do transactions that must access the bank's computer.
- This creates a lot of input, processing, output and storage, which would be too much for a set of personal computers.

b A **sub-notebook** computer is smaller than a **notebook computer**. It weighs less, has a smaller screen and keyboard, a slower processing speed and performs many of the functions of a notebook but to a lesser degree of complexity.

c An **embedded computer** is a special-purpose computer, which is used inside a device that is dedicated to one set of specific functions (such as in a microwave, dishwasher or washing machine). Its circuit board is connected to sensors and actuators (devices or hardware that moves or controls another part in response to a signal; actuators convert an electrical control signal into a physical action).

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** is a digital device that is either strapped to or carried on a user's body.
b Three examples of wearable computers: smart watches, smart glasses or visors, fitness-tracking bands, smartphones. (Any three)
c Three examples of applications of wearable computers: email, calendar or scheduler, alarm clock.

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 type of computer. It is used mainly for 'number crunching' formulae and exercises in scientific research and development. Areas include space exploration, the military, energy, weather forecasting, medicine, industry and scientific simulations.
b Two uses of supercomputers are, for example, weather forecasting and military research.
c Two examples of supercomputers currently in use are Cray's Titan and IBM Sequoia. (Other answers are possible.)

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

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

a Chip used in fifth-generation computers: Ultra-large-scale integration (ULSI)
b Features of a fifth-generation computer: will be able to accept spoken word instructions (voice recognition) and assist doctors in makings diagnoses (expert systems).

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

First-generation – vacuum tube/valve
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 two bits and is the basic unit of quantum physics).

c Quantum computers may be able to:
- explain complex molecular and chemical interactions, which could lead to the discovery of new medicines and materials
- 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

a Students should think about where and how the **teacher** can use a portable computer (such as a laptop), for example, by carrying it easily from class to class and using it to contact other classes while on the go; to maximise time when waiting for long periods between classes.

b Students should look up how a **police officer** benefits from using a portable computer (such as a laptop). Students should ask themselves, for example: What can the police officer look up concerning vehicles while on the road? What about GPS? What can he or she save on the computer for court cases or from a crime scene? What contacts can he or she make? How does it save time? What can he or she find on the internet?

c Students should look up how a **newspaper reporter** benefits from using a portable computer (such as a laptop). Students should ask themselves, for example: While the reporter is out of the office and at home, what can he or she do? How does the internet help? What and how can he or she report back to the office?

d Students should look up how a **sales representative** can benefit from using a portable computer (such as a laptop). Students should ask themselves, for example: How does the company benefit? How do customers benefit?

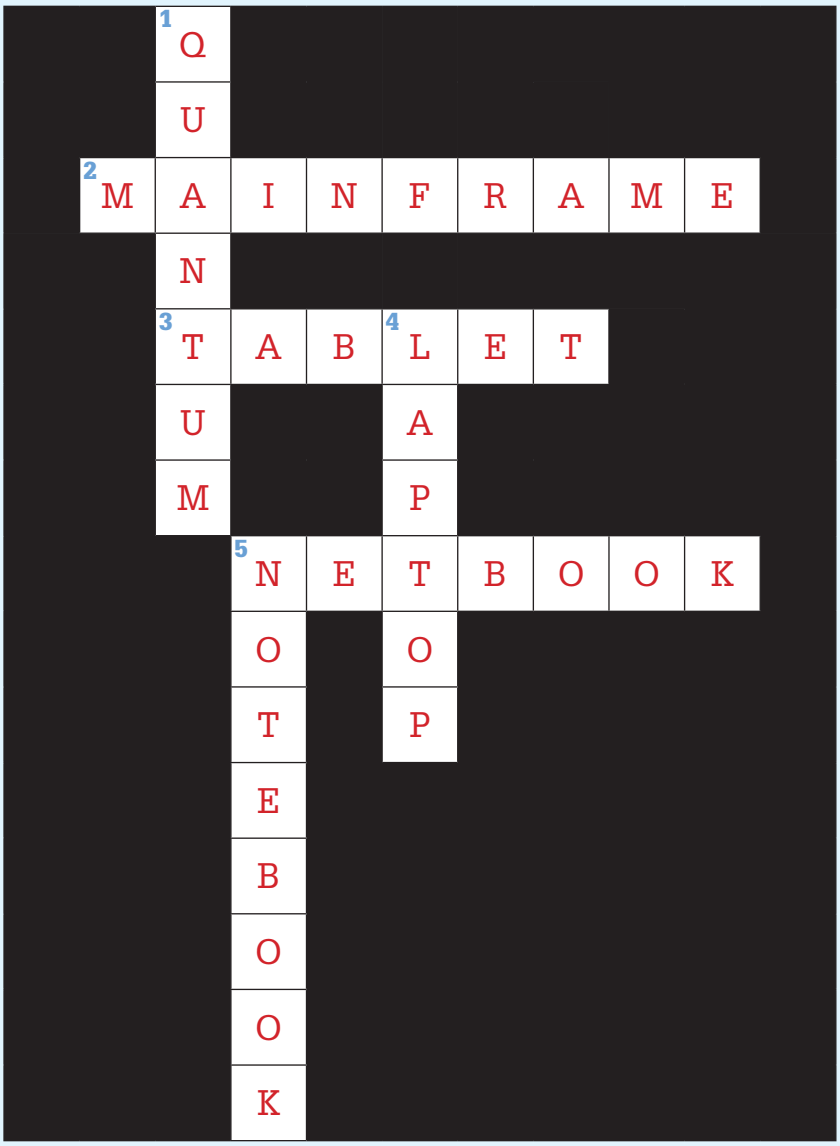
2 Do research on the internet and make a list of the top five personal computers and laptop computers at present.

Students' own answers

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' own answers

Crossword



Across

2 Very large, powerful computers

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

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

Down

1 A type of computer that works by using qubits

4 A portable version of a personal computer

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

STEM project

Your very talented school friend Usain has won a national storytelling competition. The prize is his choice of a laptop, notebook or cell phone, to a maximum value of US$1 000, but the device selected must be purchased in your country. He has asked you and two other classmates to help him choose the device that will be of most use to him. He needs to make the decision within a week or he will have to accept whatever is given to him.

1 What do you and your classmates have to do? Write a statement.

2 Produce a complete list of all appropriate available devices and their features, with the help of your classmates. How did you approach getting the information for this list?

3 Advise Usain on which device you think best suits his needs. Give reasons for your advice.

Hints

1 Where do you plan to get the most up-to-date information on the electronic devices available (for example, from computer and cell phone shops, asking advice from knowledgeable adults, and so on)?

2 How best can you and your classmates divide the work to ensure that you meet the one-week deadline?

3 Which device is most useful to Usain as a talented storyteller?

Students' will have their own answers. Before they start, remind them to read the hints that have been provided.

1 Make sure students have thought through and written a suitable statement.

2 Check students' lists and that they understood how best to approach getting the information.

3 Check students' advice on which device would be best for Usain's needs.

Questions and answers 3

Copy and fill in the blanks questions

Use these words.

monitor	capacitors	computer	35 kilovolts
metal	misuse	contact	

To prevent the **misuse** or mishandling of the equipment in the computer laboratory, we need to follow a set of rules. For example, you should not open the system unit or **monitor** casing. Also, do not insert any **metal** objects, such as clips, pins and needles, into the **computer** or monitor. Some monitors may have **capacitors**, which can store up to **35 kilovolts** of electricity. Coming into **contact** with this device may cause death.

True or false questions

1 Computers and most peripheral devices are generally safe to work with. **True**

2 A computer laboratory does not contain many electrical and other cables. **False**

3 To prevent misuse or mishandling of the equipment in the computer laboratory we need to follow a set of rules. **True**

4 Inserting metal objects into the monitor is safe. **False**

5 Switching your computer on/off too often will not cause any damage to your computer. **False**

6 Exposing your computer to excessive dust can result in it becoming defective. **True**

7 It is OK to eat and drink while working on the computer. **False**

8 You should not copy software from the school's computer if you do not have proper authorisation. **True**

9 You are allowed to change the settings in the computers at school. **False**

10 You should never bend CDs or DVDs. **True**

11 Excessive humidity and smoke does not affect CDs, DVDs and flash drives. **False**

12 Exposing CDs, DVDs and flash drives to direct sunlight will not cause any problems. **False**

13 A computer virus can be spread to other computers when an infected disk is used in other computers. **True**

Short-answer questions

1 List the personal safety rules for the computer.

- Avoid stepping on electrical wires or any other computer cables.
- Do not open the computer system unit or monitor casing.
- Do not insert any metal objects – such as clips, pins and needles – into the CPU or monitor.
- Do not touch, connect or disconnect any plug or cable without your teacher's permission.

2 List five safety rules for the computer and explain why they should be followed.

- Do not switch your computer on/off too often; this may damage the on/off switch, as well as other components in the computer.
- Avoid exposing the computer to excessive dust by covering the PC with dust covers; too much dust may affect the circuity.
- Avoid using USB drives and CDs/DVDs that were used to store information in computers from outside the lab; they may have viruses that will affect the computer and cause it to malfunction.
- Do not pile anything on the keyboard; this may damage the keys.
- Do not eat or drink in the computer room; liquids can cause short circuits or electric shocks, and food crumbs can cause malfunctions inside the computer.

(Accept any other sensible rules.)

3 State three rules for handling CDs, DVDs and USB storage.

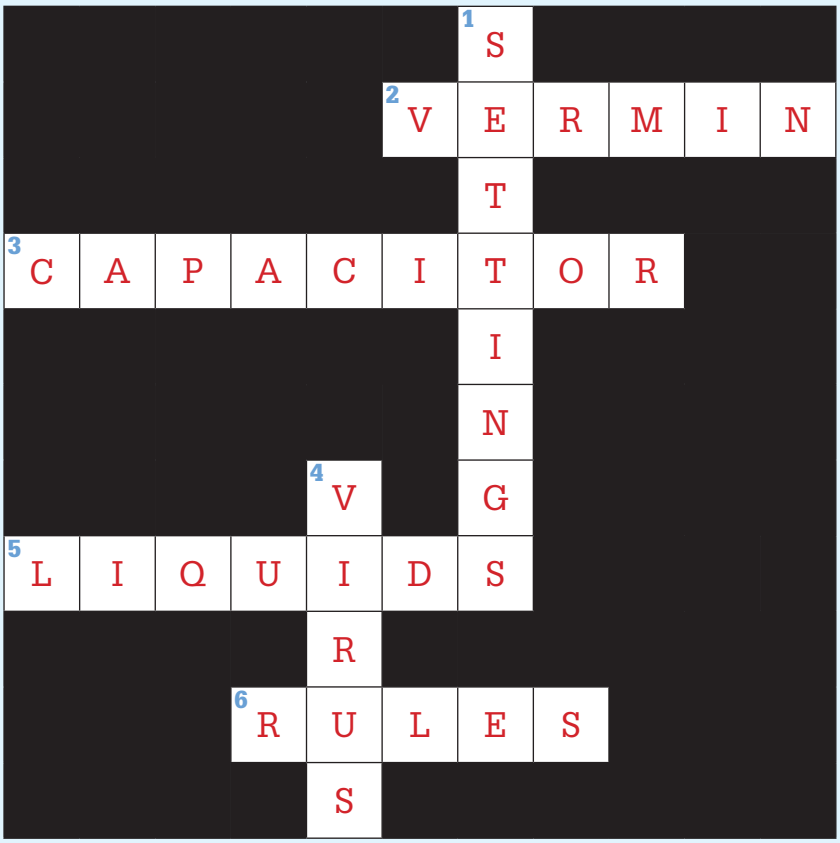
- Never bend USB storage devices, CDs or DVDs.
- Do not write on the underside of USB storage devices, CDs or DVDs.
- Do not keep USB storage devices, CDs or DVDs in sunlight.
- Keep USB storage devices, CDs and DVDs away from water and food.
- Always keep USB storage devices, CDs and DVDs covered when not in use.
- Keep USB storage devices, CDs and DVDs away from excessive humidity and smoke.

(Any three)

4 List six steps to follow in an emergency.

- Do not panic.
- Follow your teacher's instructions.
- Quickly follow the evacuation plan established for your room or building.
- Close doors behind you after everyone has left in the case of a fire.
- When you are in a safe position, pull the fire alarm (if the alarm is not already going off).
- If someone catches on fire, he or she should stop, drop and roll. The person can also be doused with water or patted with a fire blanket.

Crossword



Across

2 Creatures not wanted in the computer working environment

3 A device that can store current in a monitor

5 If these spill, they may cause short circuits or electric shocks inside the computer

6 You need these in every laboratory

Down

1 You should not change these without your teacher's permission

4 This could be transferred by flash drives or CDs/DVDs from one computer to another

STEM project

Mark Anthony is a Form 1 student, newly transferred to your school during the third term of the academic year. He was not exposed to Information Technology (IT) at his previous school. You observed Mark doing several things that are dangerous to his own well-being and also to the proper functioning of the computer laboratory. As a student who has some knowledge of IT, you feel that you should correct him.

1. Highlight four actions Mark may have been doing that you consider to be incorrect laboratory protocol.
2. Besides not doing IT before at school, what are two other possible reasons for Mark not following correct laboratory protocol? Explain why you suggested these reasons.
3. For the actions highlighted, write brief guidelines to help Mark follow the correct protocol. How would you present these guidelines to Mark to ensure that he follows them?
4. Make a poster with your guidelines to put up in the computer laboratory.
5. How would you assess your success in getting Mark to follow the guidelines within the term?

Hints

1. What is a poster? Where in your computer laboratory can you place your poster and how will this position affect the size and content in it?
2. Ask a classmate to check that he or she understands the content of your poster.

Students' answers for questions 1 to 4 will vary. Before they start, remind them to read the hints that have been provided.

1. Check that students have given four examples of incorrect laboratory procedure; this will indicate that students know the rules for working in a computer laboratory.
2. Check that students' two other possible reasons and explanations for Mark not following correct laboratory protocol make sense, for example, they could use any two of these points:
   - Avoid stepping on electrical wires or any other computer cables.
   - Do not open the computer's system unit or monitor casing – these can be dangerous. For example, some monitors may have capacitors that can store up to 35 kilovolts of electricity. Touching this device can cause an electric shock or even death.
   - Do not insert any metal objects, such as clips, pins and needles, into the computer casing or monitor casing. This may cause the device to short circuit or give you an electric shock.
   - Do not touch, connect or disconnect any plug or cable without your teacher's permission.
   - Place chairs under the desks when they are not in use.
3. Check students' guidelines to see that they make sense and will be helpful.
4. Check students' posters. Have they used their imaginations? Do the posters present the information clearly and in a way that will make others want to look at them?
5. Students' own suggestions, after asking a classmate to look at their posters, as per hint number 2.

Questions and answers 4

Copy and fill in the blanks questions

1. An inflamed tendon caused by repeated 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 RSI.
4. **Ergonomics** is a science that uses mathematics, physics and biomechanics to determine the best working conditions for people who work with machines.
5. **Neck** strain can be caused by keeping your head bent while looking down at your laptop for long periods.
6. Increased sensitivity to light is a symptom of computer **vision** syndrome.

True or false questions

1. Bad posture is a key factor in the cause of repetitive strain injury. **True**
2. One symptom of tendonitis of the wrist is a very mild pain that extends from the forearm to the hand. **False**
3. Taking frequent breaks during any long computer session to exercise your hands and arms can prevent repetitive strain injury. **True**
4. Minimising glare and reflections from the computer screen can reduce computer vision syndrome. **True**
5. Spending too much time with headphones on listening to loud music or other audio material can cause tinnitus (ringing in the ears). **True**
6. Research has found no link between certain mental illnesses and internet addiction. **False**
7. The heavy metals contained in computers can cause serious illnesses in people. **True**
8. A headache or sore neck can be a result of computer vision syndrome. **True**

Multiple-choice questions

Choose the **best** answer to each question.

1 All of the following are symptoms of computer vision syndrome except for:

a sore, tired, burning, itching or dry eyes. **b** blurred or double vision.

c a headache or sore neck. **d extreme pain in the forearm.**

2 Which of the following type of worker is most prone to repetitive strain injury?

a Musician **b** Engineer

c Doctor **d** Teacher

3 Lower back pain due to extended computer use may be reduced or removed by:

a using a firm, adjustable and comfortable chair.

b stretching your lower back now and then by standing up, pulling each knee to your chest and holding that position for a few seconds.

c relaxing your shoulders. **d all of the above.**

4 Which of the following illnesses may be caused by internet addiction?

a Depression **b** A common cold

c A rash **d** Pimples

5 Which of the following is a negative effect of digital technology use on the environment?

a Reduction in paper usage **b** Reduction in building construction

c Consumption of energy **d** Reduction in fuel usage

Short-answer questions

1 **a** Name two types of repetitive strain injury.
b List three key factors that can result in RSI.
c Describe three ways to prevent or reduce RSI.

a Two types of repetitive strain injury:
- tendonitis – where a tendon is inflamed, caused by some repeated motion or stress on that tendon
- carpal tunnel syndrome (CTS) – an inflammation of the nerve that connects your forearm to the palm of your hand.

b RSI can be caused by:
- repetition, for example, using the keyboard or mouse constantly for many hours
- bad posture, for example, many hours at the computer, sitting incorrectly or in the same position
- lack of rest, for example, many concentrated hours using the keyboard with few or no breaks.

c To prevent or reduce RSI:
- 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.
- Position the mouse at the same height as your keyboard.

(There are other possible answers.)

2 **a** Explain 'computer vision syndrome'.
b List four conditions that may result from computer vision syndrome.
c Describe three ways to reduce or prevent computer vision syndrome.

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

(Any four)

c Ways to reduce or prevent CVS:
- Take a break of 5 to 10 minutes away from the computer every hour.
- Reduce glare and reflections from the computer screen. Clean your screen and block out excessive sunlight and reflections from lamps.

- Use monitors designed to adjust brightness and screen position. Adjust the contrast and brightness of the computer screen so that there is a high contrast between the text on the screen and the screen background.
- Prevent eye strain by positioning the top of your screen at, or slightly below, eye level. Experiment to find a distance between your eyes and the screen that feels comfortable (usually 45 to 71 cm).
- Gently massage your eyes, cheeks, forehead, neck and upper back from time to time to keep blood flowing and muscles loose.
- Blinking lubricates your eyes with tears and another solution to prevent it from drying out. Blink often when staring at the screen.

(Any three)

3 **a** Describe two situations that may result in neck strain caused by improper computer use.

b State three ways to prevent or reduce neck strain.

a Situations that can result in neck strain:

- Looking down at your laptop with your head puts unnecessary strain on your neck muscles, which can lead to pain, including tension headaches.
- Holding your cell phone between your neck and your shoulder can put your neck in a harmful position.
- Spending long periods of time texting with your head down over your cell phone puts pressure on your neck muscles.

(Any two)

b Three ways to prevent or reduce neck strain:

- Use a 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 with your laptop in this position.
- Take short breaks to do some simple movements like shoulder rolls while studying or working.

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

b Describe three ways to prevent or reduce lower back pain caused by computer use.

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

- long hours of sitting at the computer with bad posture
- sitting on uncomfortable, poorly designed or incorrectly assembled furniture.

b Ways to prevent or reduce lower back pain caused by computer use:

- Use a firm, adjustable and comfortable chair. 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 occasionally by standing up and pulling each knee to your chest, holding that position for a few seconds.
- Relax your shoulders. When you type on the keyboard, your upper arm and forearm should form a right angle, with your wrist and hand in roughly a straight line.
- Take short breaks (5 to 10 minutes per hour) and get up from your desk and walk around.

(Any three)

5 **a** Name three types of mental illnesses associated with internet addiction.
b Describe two ways to reduce or prevent mental illnesses associated with internet addiction.

a Three types of mental illnesses associated with internet addiction:
- depression
- low self-esteem
- loneliness.

b Two ways to reduce or prevent mental illnesses associated with internet addiction:
- Reduce the number of hours that you spend on the internet.
- Spend time having physical face-to-face conversations with others.

Research questions

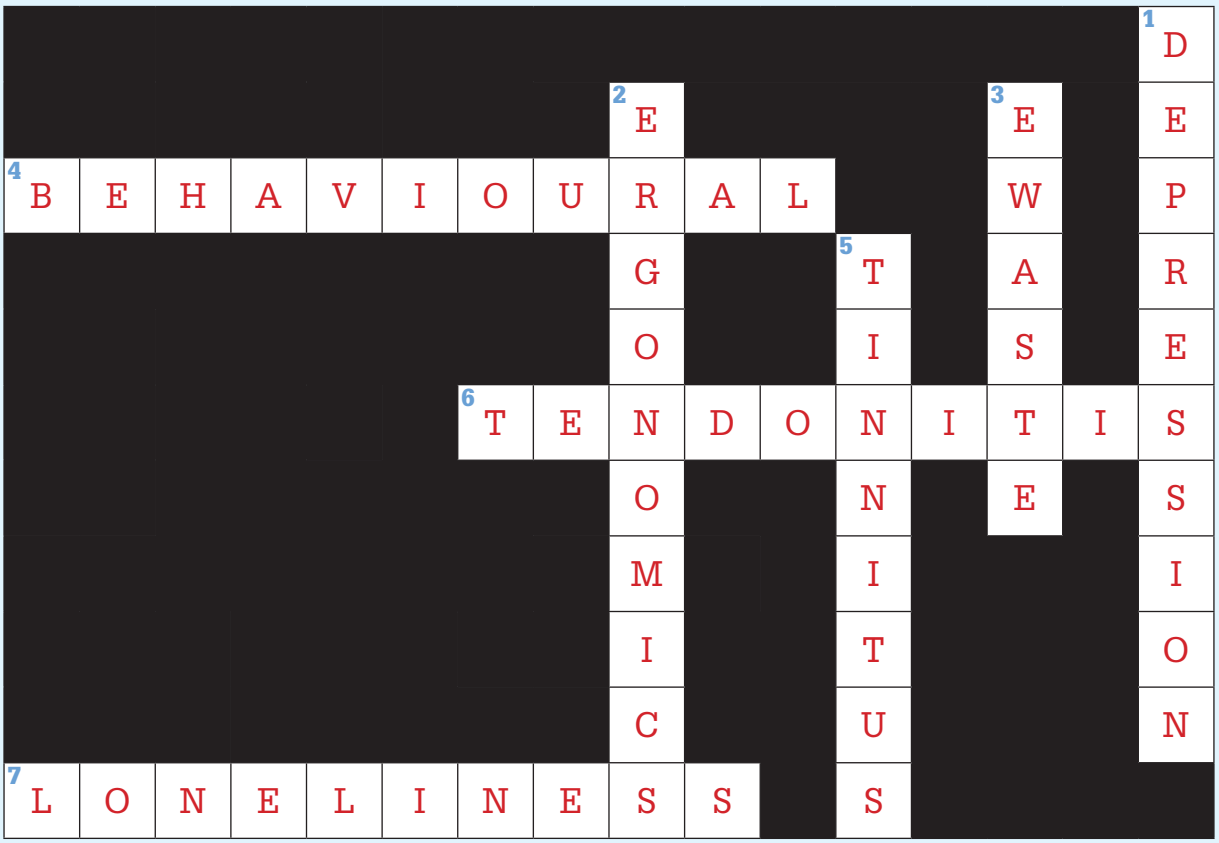
1 Use the internet to conduct research and then complete the following:
a List three types of jobs other than those mentioned in this chapter that can cause employees to suffer from RSI.
b State which type of RSI the employees may suffer from.
c Which profession has the highest rate of RSI?

Students' own answers

2 Conduct research and then complete the following:
a Which devices are currently being manufactured using ergonomic design principles?
b List three companies that manufacture ergonomically-designed computer peripherals.

a Students' own answers, for example: workstations (including the chair or seating, desk, computer, mouse and keyboard), the computer workplace, headsets, microphones and even clothing.
b Students' answers will vary. Three examples are:
- Neveast Supplies Limited (Jamaica)
- Humanscale (USA, Ireland, Hong Kong, Australia)
- Workrite ergonomics* (USA, Canada).

Crossword



Down

1 This illness may result from excessive use of digital technology

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

3 Another name for technological waste

5 A condition caused by spending too much time with headphones on listening to loud music or other audio material

Across

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

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

7 May be caused by internet addiction

STEM project

You have been invited to *The World Information Technology Summit* to present on the topic 'Your Computer, Your Health, Your Responsibility'. You have been asked to focus on the most widespread health issues that have an impact on computer users. You only have ten minutes for your presentation, as several students from other countries are also presenting on different topics.

1. Write a comprehensive title for your presentation.
2. Write down what you consider to be the five most important points to explain in your presentation.
3. Write your presentation in no more than 150 words. Use a few real-life examples from your school situation to explain your points.
4. Ask a group of your classmates to read your presentation and give you feedback on how useful it is. What feedback did you get?
5. What changes did you make to your presentation based on the feedback you received?

Hints

1. What are the key world health issues facing computer users? Do research to draw up a shortlist of these issues and to obtain supporting statistics.
2. Write three possible titles for your presentation, and then select the most appropriate one.
3. Is your presentation within the ten-minute time limit?
4. Before sharing your presentation with your classmates, check it against the content of this chapter.

Students' answers for questions 1 to 5 will vary. Before they start, remind them to read the hints that have been provided.

1. Is the student's presentation title comprehensive?
2. Do the student's five most important points explain the presentation?
3. Check that the presentation is no more than 150 words. Have sensible real-life examples been used?
4. Check and discuss students' feedback. Encourage positive and constructive feedback to help one another.
5. Check and discuss students' feedback, so that they know where they might improve and where they have done well.

Questions and answers 5

Copy and fill in the blanks questions

1 **Word processing** is the preparation of documents such as letters and reports 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 **Formatting** allows you to change the appearance of the text in a document.

5 The **backspace** key deletes the character to the left of the insertion point.

True or false questions

1 Many neck, back and CTS problems are caused by poor posture when typing. **True**

2 The word wrapping feature lets you move to a new line without pressing the Enter key. **True**

3 Apple® iWork® Pages® is a word processor. **True**

4 Formatting a document includes changing the font colour and font type of the text. **True**

5 A footer is text or graphics that appear in the top margin of every page of a document. **False**

Multiple-choice questions

Choose the **best** answer to each question.

1 Which group would you use to change the style, size and colour of a typeface?

a Clipboard **b Font**

c Paragraph **d** Styles

2 In word processing, you press the Enter key while typing a document when you want to:

a create blank lines. **b** keep a typed line short in appearance.

c create a new paragraph. **d** do all of the above.

3 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

4 Pressing this key immediately after an action cancels or takes you out of that action:

a Alt **b** Backspace

c Esc **d** Shift

Short-answer questions

1 What is word wrapping?

Word wrapping is a feature that allows you to move automatically to a new line without pressing the Enter key.

2 Why do you need to save a previously saved document after making changes to it?

You need to save a previously saved document after making changes to it, so that you save the latest additions or changes to that document, which have not yet been saved. The changes are saved to the previously saved file.

3 Name three special keys in the keyboard and describe their function.

- **Backspace:** This key deletes the character to the left of the cursor or insertion point.
- **Delete:** This key deletes the character to the right of the cursor or insertion point.
- **CapsLk:** toggles between upper case and lower case letters while typing.

(There are other possible answers.)

4 The data below is a list of five students with their corresponding 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 do the following:

a Type out the data in a tabular format with the given headings.
b Make bold and underline each heading.

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

5 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 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, 1430, 29 Earth days
Uranus, 47 200, 2 870, 84 Earth days
Neptune, 44 600, 4 500, 154 Earth days
Pluto, 6 000, 5 900, 248 Earth days

You are required to do the following:

a Create a table with ten rows and four columns.

b Put the information above into the table under the headings in the appropriate columns.

a and **b**

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
Pluto	6 000	5 900	248 Earth days

6 Create a flyer to advertise a function (a bazaar, sports day, or so on) at your school. The flyer must contain graphics.

Students' flyers will vary, but here is an example:

Research questions

1 Use the internet to do research and complete the following:

a Name three word-processing programs currently available.

b Which is the most popular word-processing program currently on the market?

c What are the differences between a modern word-processing program and a desktop publishing software?

d Create a list of shortcuts using the Ctrl key and the alphabetic keys using the Microsoft word-processing application.

a Students should know of Microsoft Word, Kingsoft Writer and Apple® iWork® Pages®. They should try to find three more.

b Is it Microsoft Word or Open Office Suite, or some other word-processing program? It must be used almost worldwide and be free or affordable.

c Online, learners should find the definition for desktop publishing. How is it different to word processing? They should compare the type of documents each creates and how text and pictures are added. Students could also compare the cost and find out which is more widely used.

d Students should look up shortcut keys in Microsoft Word, then write the shortcut keys and their uses. Some of these are also used in other programs. One example is Ctrl + B, which bolds the letters and other text you type. The plus sign +, just means you hold down Ctrl and the letter at the same time. There is also Ctrl + V and Ctrl + A. Students should look for at least five more. They should choose those that involve text in Microsoft Word.

2 You are a new teacher at a school.

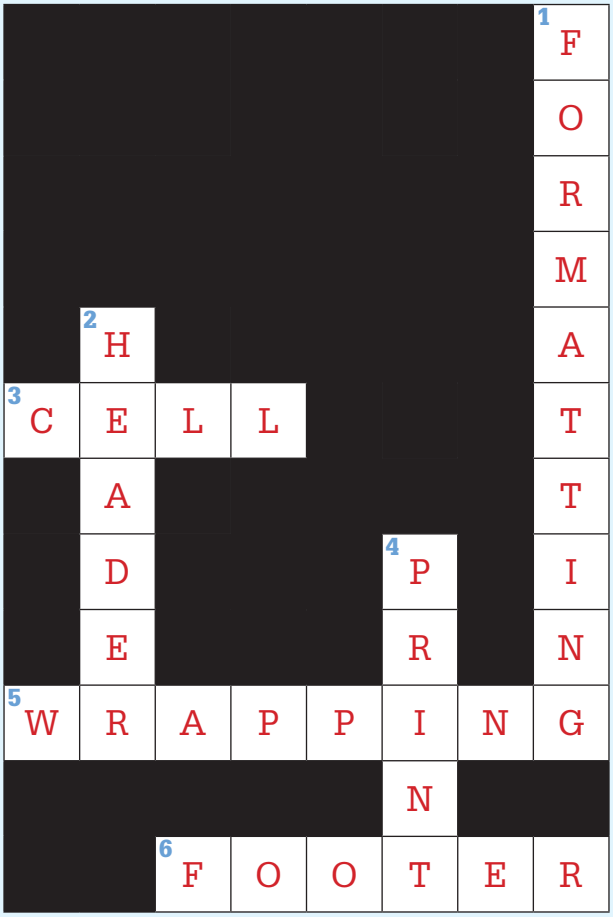
a List five types of documents a teacher may use a word processor to create.

b List three types of documents a secretary in the school may have to create.

a Students should think of what **teachers** give them to use in class, to take home, what they put up on the wall or on certain boards, what document they get their topics from or what they do to promote an event and more.

b The **secretary** does work for the school principal. Students should think of what documents the principal may want prepared. For example, documents concerning misbehaving students or students who may be changing schools, a fund raiser, a meeting, documents for students and more. Students should say exactly what those documents are.

Crossword



Down

1 Allows you to change the appearance of the text in a document

2 Appears in the top margin

4 Mode you are in when you open a new Word document

Across

3 The intersection of a row and a column in a table

5 When text flows around a graphic

6 Appears in the bottom margin

STEM project

Your Agricultural Science teacher also teaches Information Technology (IT) and would like you and a group of four other classmates to construct a table with useful information on the types of fruit trees found in your community. The table should have at least ten rows and ten columns, but must fit onto a single A4 page for printing out to display at an upcoming Parent's Day at your school. Your table should show elements of the chapter on word processing that you have just been taught in IT class.

1. What is the most appropriate title for your table? Write a paragraph on what your table is about and why it is useful to you and your community.
2. In a step-by-step approach, explain how you and your classmates plan to create this table. Did you decide to appoint a lead person? Give a reason for your answer.
3. Produce your one-page table.
4. Compare your table to others produced by other groups of classmates. Suggest ways to combine the content of their tables with yours to produce a useful document for your teacher to use in teaching the Grade 1/Form 1 class next year. This document does not have to be in a table format and can be more than one page in length.

Hints

1. Draw or obtain a map of your community showing the main fruit trees. List the types of fruit trees using their common and biological names.
2. Ensure that each team member contributes during all stages of preparing the table. Your teacher may find it helpful if you state who was responsible for each contribution at the bottom of the table.
3. Which graphics can you include to make your table more useful?

Students' group answers for questions 1 to 4 will vary. Before they start, remind them to read the hints that have been provided.

1. Have the groups given an appropriate title for their table? Check that their paragraph explains clearly what the table is about and why it is useful to them and their community.
2. Have groups explained in a step-by-step approach, how they would create the table? Did the group decide to appoint a lead person? Have they given a reason that makes sense?
3. Check students' tables.
4. A group and/or class discussion would help students to produce a useful document.

Questions and answers 6

Copy and fill in the blanks questions

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 communication system is known as a **channel**.

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

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

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

6 The networking hardware device that allows a WiFi device to connect to a wired network is a **wireless access point (WAP)**.

7 The device that acts as an interface between two networks is known as a **router**.

8 The interconnection of networks in a city into a single larger network is known as a **MAN**.

9 The **internet** is a network of networks that connects computers worldwide via a huge set of telecommunications links.

10 A search engine is also sometimes called a **web** portal.

True or false questions

1 The encoder is a device that converts the encoded signals into digital form. **False**

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

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

4 A switch increases the overall performance of the devices on the network. **False**

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

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

7 The main purpose of a modem in a home network is to connect your home internet connection with your internet service provider (ISP). **True**

8 An internet service provider (ISP) is a company with a direct connection to the internet, which it lets users access, usually for a fee. **True**

9 The World Wide Web is another name for the internet. **False**

10 In order to find, retrieve, display and send hypertext and hypermedia, you need a browser. **True**

Multiple-choice questions

Choose the **best** answer to each question.

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

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

2 This type of network is usually found in schools and businesses located in a small geographical area.

a WAN
b LAN
c MAN
d PAN

3 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.

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

a MAN.
b PAN.
c LAN.
d WAN.

5 Which of the following allows members to post questions, start a discussion or contribute to various discussions?

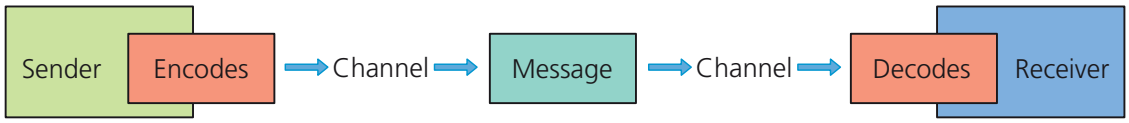
a Discussion forum
b SMS
c Video-conferencing
d VoIP

Short-answer questions

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

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

a



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

- **Sender** – the device (for example, a computer, smartphone, fax machine, laptop, notebook or tablet) that sends the message.
- **Encodes** – the encoder converts digital signals in a form that can pass through a transmission medium. (A modem performs the role of both an encoder and a decoder.)
- **Message** – the data or information to be communicated; it may consist of text, numbers, pictures, sound, video or any combination of these.
- **Channel** – the physical path that connects the sender and receiver; it is used to transmit data. The channel can be wired (twisted-pair wire, coaxial cable or fibre optic cable) or wireless (radio waves, microwaves, infrared, Bluetooth and satellite).
- **Decodes** – the decoder converts the encoded signals into digital form. The receiver can understand the digital form of the message. (A modem performs the role of both an encoder and a decoder.)
- **Receiver** – the device that receives the message; it can be a computer, printer, smartphone or another computer-related device. The receiver must be able to accept the message.

2 **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 the organisation.

a **LAN** is short for local area network; it consists of a collection of microcomputers, which can share peripherals, files and programs, and communicate with one another on the network. Each microcomputer that forms part of the network is connected either by cables or by a wireless link.

b 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.
- It is usually cheaper to buy one copy of a software application and pay the licence fee for several machines, than to buy individual packages for each computer.
- Users can work together on a single document.
- Users can communicate using email.

(Any three)

c Disadvantages of a LAN:
- The initial set-up costs are high.
- The risk of data corruption is higher. A LAN has many users on the system, so the chance of data being tampered with or corrupted is greater.
- The malware (software that corrupts, steals or deletes data) risk is greater, because it can be spread easily between the computers on the LAN.
- If the file server fails, all the workstations will be affected and work stored on shared hard disk drives will not be accessible; nor, for example, will it be possible to use network printers.
- Networks can be complicated to maintain and may require a network manager, so incurring additional costs to a company.

(Any three)

d Organisations that may use a LAN are offices, departments and schools. (Any two)

e The purpose of the LAN in an organisation is that each computer can function both as an independent personal computer running its own software, and as a workstation on the network, accessing information from the network server. The server runs the networking software that allows resources to be shared with the other computers (called clients) on the network. The devices shared by a LAN may include printers, hard drives, optical drives (CD-ROM, CD-RW, DVD-ROM, DVD-RW), modems and fax machines.

3 Explain the purpose of the following devices in a wireless LAN (WLAN):

a Switch

b Router

a A **switch** connects multiple devices on the same network to facilitate communication among them.

b A **router** is used when there are two separate local area networks (LANs) or when an office wants to share a single internet connection among multiple computers. The two types of routers are wired and wireless. The choice depends on the physical office or home setting, speed and cost.

4 **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 above.

a A **WAN** connects multiple devices on the same network to facilitate communication among them.

b Two organisations that may use a WAN are universities, research centres and banks or large organisations. (Any two)

c Benefits of a WAN:
- to share information
- to share information and processing loads between various branches of large organisations, companies and banks in different countries
- to publish documents and distribute software.

(Any two)

5 Explain the following terms:

a FTP
b Upload
c Download
d VoIP

a **FTP** is short for file transfer protocol; it is a set of rules for communicating over the internet. FTP enables you, through an FTP program, to find an electronic file stored on a computer in another location and download it. In other words, take a file from one computer on the internet and copy it to a storage device on your computer.
b **Upload** means to send files to other computers on the internet.
c **Download** means to receive files on your computer via the internet.
d **VoIP** is short for voice-over internet protocol; it is the transmission of telephone calls over computer networks using the internet rather than traditional communication lines to support voice communication. You would need an internet telephone (or other appropriate input and output device), an internet connection, a sound card and specialised software.

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), but several people 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.

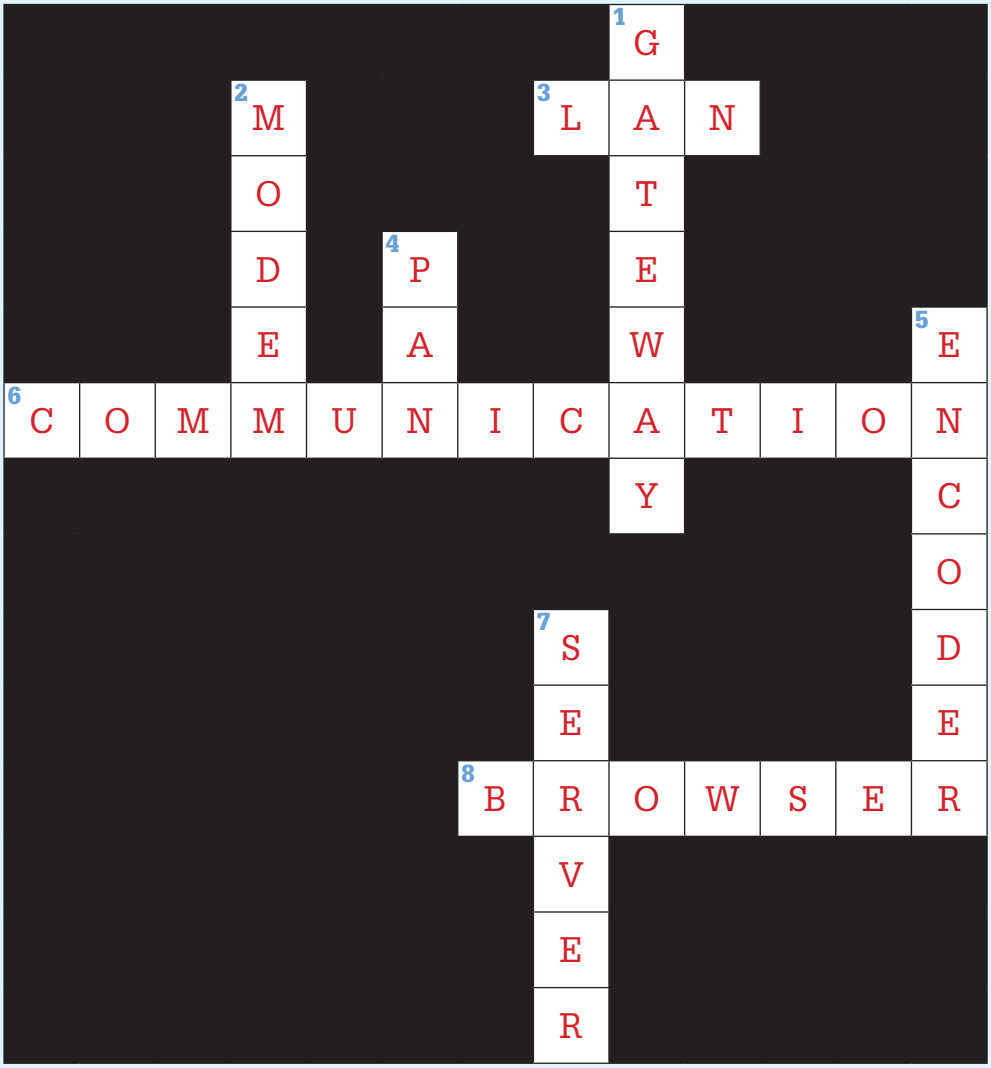
a What hardware is required for a WLAN?
b Would the thick walls in the building affect the network? If the walls would affect the network, how could this problem be resolved?
c Which security concerns exist for a WLAN? If there are security concerns, what steps can be taken to protect the network?
d Does the wireless network present any health hazards?
e Which advantages does a wireless network have over a wired network for the needs of the company?

Students' answers will vary. Check their work for understanding of what has been taught.

2 **a** Which 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 usage and that of your family, which plan would you purchase? Explain your choice.

Students' answers will vary. Check their work for understanding of what has been taught.

Crossword



Down

1 An interface that enables communication between two different networks

2 A hardware device that allows a computer to send and receive data over a telephone line or a cable or satellite connection

4 A computer network organised around an individual person, and set up for personal use only

5 A device that converts digital signals in a form that can pass through a transmission medium

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

Across

3 A collection of microcomputers, such as in an office building, department or school, which can share peripherals, files and programs, and communicate with each other on the network

6 Described as the process by which information is transmitted or exchanged

8 A program that resides in your computer and enables you to find, retrieve, view and send hypertext and hypermedia documents over the web

STEM project

The Bank of Commerce Caribbean (BCC) is a fairly new financial institution. It started off with one bank in Jamaica and now is opening another Jamaican branch within a month and expanding to St Kitts in the months thereafter. At present, it has a local area network connecting all of its devices. However, the main method of communication among the bank departments is printed circulars. Printed circulars are also sent to investors, stakeholders and customers. You are a member of an IT team advising the bank on its networking needs. The team consists of students from your class.

1 What is a major problem that BCC will face when it expands?

2 What are three possible reasons for this problem?

3 Use a step-by-step approach to explain how your team will work out a solution to the problem.

4 Recommend a solution to the problem facing the bank that you stated in question 1. Use posters or any other media tools that you can use competently to produce a presentation that you can show to the bank managers.

5 What challenges did you face while working out a solution, and how did you overcome them?

Hints

1 List the research you must do to understand the problem facing the bank. Which methods of research do you plan to use?

2 Ensure that each team member contributes at least one idea or action in the step-by-step planning to work out a solution.

3 Your solution should be clear, simply presented and emphasise the advantage of computerised (electronic) circulars over printed ones.

Students' group answers for questions 1 to 5 will vary. Before they start, remind them to read the hints that have been provided.

1 Have team members clearly explained the major problem that BCC will face when it expands?

2 Check each team's three possible reasons for the problem.

3 Have students managed to explain, in a step-by-step approach, how their team will work out a solution to the problem?

4 Check that students have been able to recommend a solution to the problem facing the bank using posters or other media tools. They should be able to produce a suitable presentation.

5 Were teams able to discuss and verbalise the challenges they faced while working out a solution, and how they overcame these challenges?

Questions and answers 7

Copy and fill in the blanks questions

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

2 The unique and original works of a person or an organisation is referred to as **intellectual property**.

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

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

5 **In-text** citation refers to a citation that is placed within a document.

6 Software **privacy** is the unauthorised copying, use or selling of software that is copyrighted.

7 An **online** source is material that you find online.

8 **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.

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

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

True or false questions

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

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

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

4 Accessing someone's personal information on a computer system without permission is ethical. **False**

5 Copyright laws allow the owner of a piece of work to take legal action against instances of infringement or plagiarism. **True**

6 Plagiarism involves stealing or using someone else's work and passing it off as your own. **True**

7 Copying images from other websites to paste them into your own papers or websites without referencing is not regarded as plagiarism. **False**

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

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

Multiple-choice questions

Choose the **best** answer to each question.

1 Which of the following refers to intellectual property (IP)?

a Ideas **b** Art

c Inventions **d All of the above**

2 The following are examples of plagiarism except for:

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 The following are all criteria that make an online source credible except for:

a source. **b** author.

c objectivity. **d attractiveness of the site.**

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

a An image **b** A video

c A piece of music **d All of the above**

5 Which of the following 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)

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.

Examples of unethical behaviour related to computer use:
- plagiarism (stealing someone's work and presenting it as your own)
- copying, using or selling copyrighted digital content from the internet or other sources without the author's permission
- accessing someone's personal information on a computer system without their permission.

(Any two)

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

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

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

4 Explain the term 'intellectual property rights'.

Intellectual property rights are the rights to which creators are entitled for their work, which includes ideas that have been recorded, inventions, art, writings, processes and trademarks.

5 **a** Explain the term 'plagiarism'.
b Give three examples of plagiarism.

a **Plagiarism** is the act of using/stealing the work of someone else without permission or pretending that the person's work is one's own.

b Examples of plagiarism:
- submitting someone else's work as your own
- copying words or ideas from someone else's work without giving credit
- failing to properly reference work (not using quotes or giving incorrect information about the source)
- changing words, but keeping the sentence structure of a source without giving credit
- using an image, video or piece of music in work that you have produced without receiving proper permission or providing 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)

6 Explain five ways to determine the accuracy of online information.

To determine the accuracy of online information, check:
- the source (where the information comes from), for example, national, international, educational or government institution
- the uniform resource locator (URL), for example, government (.gov), educational institutions (.edu)
- the information and relevant details about the organisation
- if the material is sponsored – this should be shown clearly on the website, with a link to the organisation
- for confirmation that the sponsor is legitimate (real)
- the date and name of the person who wrote the article (author); most accurate
- that the information online shows the date on which it was written or updated; information should be as current as possible
- that the content is comprehensive; it should give a works cited page or reference page with the sources used to write the article; scholarly online articles should list a works cited page.

(Any five)

Research questions

1 State the copyright laws of Jamaica.

Students should find the website for the Jamaica Intellectual Property Office. This site will give them the information that they need. Other sources are provided on the site.

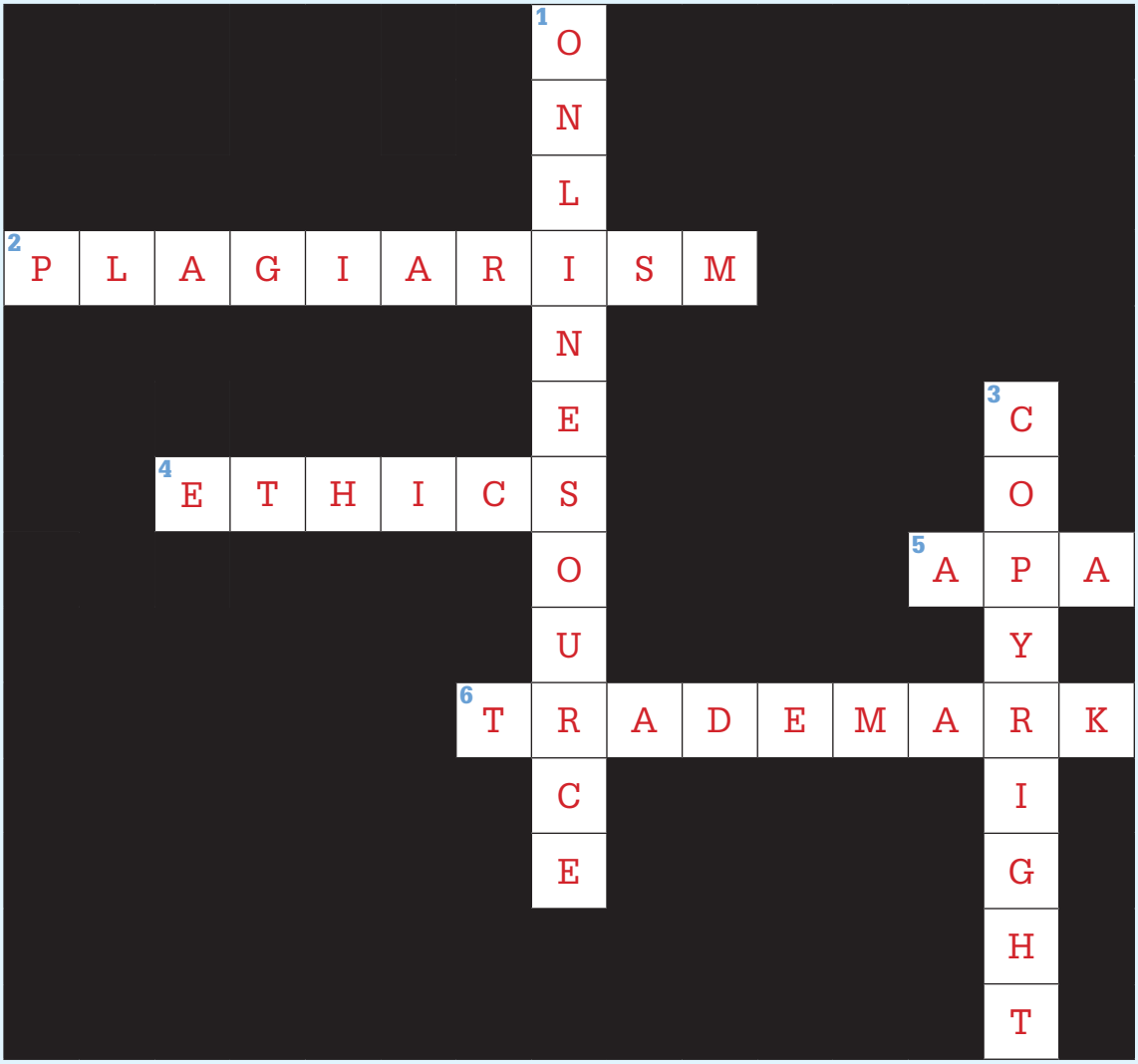
2 State the penalty for breaking the law.

Students should be able to find information about the penalty for breaking copyright law on the Jamaican Information service website: "Most of these matters have culminated in varying fines and suspended sentences. Under the Copyright Act the maximum fine for a breach is $100,000 and or two years imprisonment, per offence or count. ... He can do both criminal and civil prosecutions" [May 5, 2004]

3 Give two examples of products patented by Jamaicans.

Students may answer the question based on their country. Answers will vary.

Crossword



Down

1 Material that you find online

3 Applies to work that is recorded in some way

Across

2 Refers to the act of using the work of another author without authorisation or representing the work of an author as one's own

4 A set of moral principles that govern the behaviour of a group or an individual

5 A style of referencing that is the most common method used to cite sources within the social sciences

6 Name, word, slogan, design, symbol or other unique device that identifies a product or organisation

STEM project

Your favourite musician Smooth Vibes has posted a retraction of his latest song 'Song-a-Sing' on all social media platforms. He also issued an apology to another well-known musician for branding that musician's work as his own.

1 What is the appropriate term for Smooth Vibes's action that resulted in his retraction?

2 Outline five major steps in producing an original song. Which step(s) are related to the content of this chapter? Explain these steps in detail.

3 Outline two ways in which Smooth Vibes could have used his colleague's lyrics without getting into problems.

4 List three ways in which intellectual property rights can be infringed. Explain each one, giving a Caribbean example.

5 You have decided to write an article highlighting your new knowledge on this situation. However, you are now aware that you need to cite (acknowledge) your findings. In your article, explain two ways of citing information related to the music industry.

Hints

1 What are the components of a successful song? How important is the music versus the lyrics?

2 What types of research did you do to help you decide on the five major steps in writing an original song, for example, online research, interview musicians/songwriters, visit to copyright organisation, and so on?

3 Ask an adult who is an expert in the music field to read your article and make adjustments if necessary before you publish it.

Students' group answers for questions 1 to 5 will vary. Before they start, remind them to read the hints that have been provided.

1 The appropriate term is plagiarism.

2 Check that students' five steps are logical.

3 Check that students have researched copyright laws.

4 Ways in which intellectual property rights can be infringed:

- submitting someone else's work as one's own
- copying words or ideas from someone else's work without giving credit
- failing to properly reference work (not using quotes or giving incorrect information about the source)
- changing words, but keeping the sentence structure of a source without giving credit
- copying images from other websites to paste them into one's 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 one has created, without permission
- performing another person's copyrighted music without permission.

(Any three – and check students' Caribbean examples.)

5 Check that students have understood that generally speaking, there are two proper and common ways to cite sources – they may opt to follow the citation format provided by either the American Psychological Association (APA) or the Modern Language Association (MLA).

Questions and answers 8

True or false questions

1 You cannot write text in the drawing area. **False**

2 You can create and customise your graphics in the drawing area. **True**

3 You cannot copy and paste an object drawn in Paint. **False**

4 The colour palette offers only a small number of colours. **True**

5 Paint does not allow you to remove an object. **False**

6 The Brushes tool creates only one size of brush stroke. **False**

7 You cannot resize your object. **False**

8 An object can be flipped vertically but not horizontally. **False**

9 There are only five basic shapes in the shapes panel. **False**

10 You can import a graphic into Paint 3D. **True**

Multiple-choice questions

Choose the **best** answer to each question.

1 The graphic shown in Figure 8.21 tells you that you are:

Figure 8.21

a using the curve tool.
b **using the marker tool.**
c using the pencil tool.
d using the line tool.

2 Which graphic means that you can change the fill colour of an object?

a 
b 
c 
d 

3 The graphic in Figure 8.22 illustrates the use of the _____ tool.

Figure 8.22

a flip
b skew
c paint brush
d airbrush

4 The graphic in Figure 8.23 has been made using the _____ tool.

Figure 8.23

a paint brush
b airbrush
c pencil
d fill

5 Which one is not an attribute you can adjust in your image?

a Opacity
b Colour
c Thickness
d Quality

Word sleuth

Copy this grid into your notebook. Then find these words in your copied grid and circle them. The words can be written horizontally from left to right and from right to left, as well as vertically and diagonally top to bottom and bottom to top.

SPRAYCAN	CRAYON	PENCIL
CURVE	FLIP	PENTAGON
OPACITY	CIRCLE	RECTANGLE
ERASER	PAINT	ROTATE
EYEDROPPER	MARKER	SELECT
FILL	PALETTE	

S	T	K	V	I	U	X	R	E	S	A	R	E	W	K
P	E	U	Q	W	E	R	V	Y	I	O	P	A	Z	X
R	B	L	N	L	M	R	E	C	T	A	N	G	L	E
A	Y	U	E	T	U	K	P	F	O	R	K	Q	A	H
Y	Q	W	P	C	L	O	T	R	E	K	R	A	M	P
C	E	F	G	Y	T	I	C	A	P	O	Y	R	I	R
A	Q	W	E	J	R	T	R	O	T	A	T	E	L	E
N	W	Y	U	Y	F	O	A	P	A	F	G	I	K	P
E	R	P	S	W	I	D	Y	F	G	O	F	L	I	P
T	Y	H	A	Q	L	J	O	C	K	I	T	K	U	O
T	P	Z	X	I	L	C	N	V	I	T	J	Y	E	R
E	U	T	C	H	N	O	M	V	B	R	M	N	W	D
L	C	N	S	F	M	T	Q	E	R	O	C	R	Q	E
A	E	W	S	D	F	M	L	K	T	R	G	L	B	Y
P	E	N	T	A	G	O	N	B	V	E	Y	P	E	E

Short-answer questions

1 What is RGB colour?

RGB colour is the colour scheme where all colours are produced by mixing the primary colours of light, namely red, green and blue, and is the basis for all computer screen graphics.

2 List four tools found in the Brushes panel and explain their function.

Tools found in the Brushes panel:

- Marker tool – a basic drawing tool for doing simple line drawings.
- Pencil tool – allows you to create basic drawings with qualities similar to traditional pencil drawings.
- Pixel pen tool – allows you to create basic drawings with qualities similar to traditional pen drawings.
- Oil brush – in the same way that a painter can select a range of different-sized paint brushes to paint with, you can adjust the size of the brush from the options provided.

- Watercolour brush – in the same way that a painter can select a range of different-sized paint brushes to paint with, you can adjust the size of the brush from the options provided.
- Spray can tool – allows you to apply colour to a graphic gradually; the size of the spray can be adjusted from the options provided.
- Fill tool – used to fill an area; the more you move the mouse over the specific area, the more colour is applied.
- Eraser tool – allows you to remove (erase) part of a graphic, leaving behind just the background colour of the graphic.
- Calligraphy pen – the quality of the drawing is similar to that of a traditional calligraphy pen; you can adjust the thickness of the pen and the colour and quality of the material.
- Crayon tool – the quality of the drawing is similar to that of a traditional crayon; you can adjust the thickness of the crayon, as well as the colour and quality of the material.

(Any four)

3 When and why would you use the Magic Select tool instead of the Rectangle Select?

The Magic Select tool outlines the selected part of your image and lifts it out of the object. The Rectangle Select tool only allows you to select rectangular areas.

4 Drawing an object using the mouse can be difficult. Explain why.

Using the mouse to draw requires good coordination, which takes time and practice.

5 Can you think of a better device that you might use instead of a mouse when working in Paint? Explain how this device can help with drawing.

If you have a touchscreen, you can use a stylus, which will give you better accuracy in your drawing.

6 What is the purpose of the eyedropper?

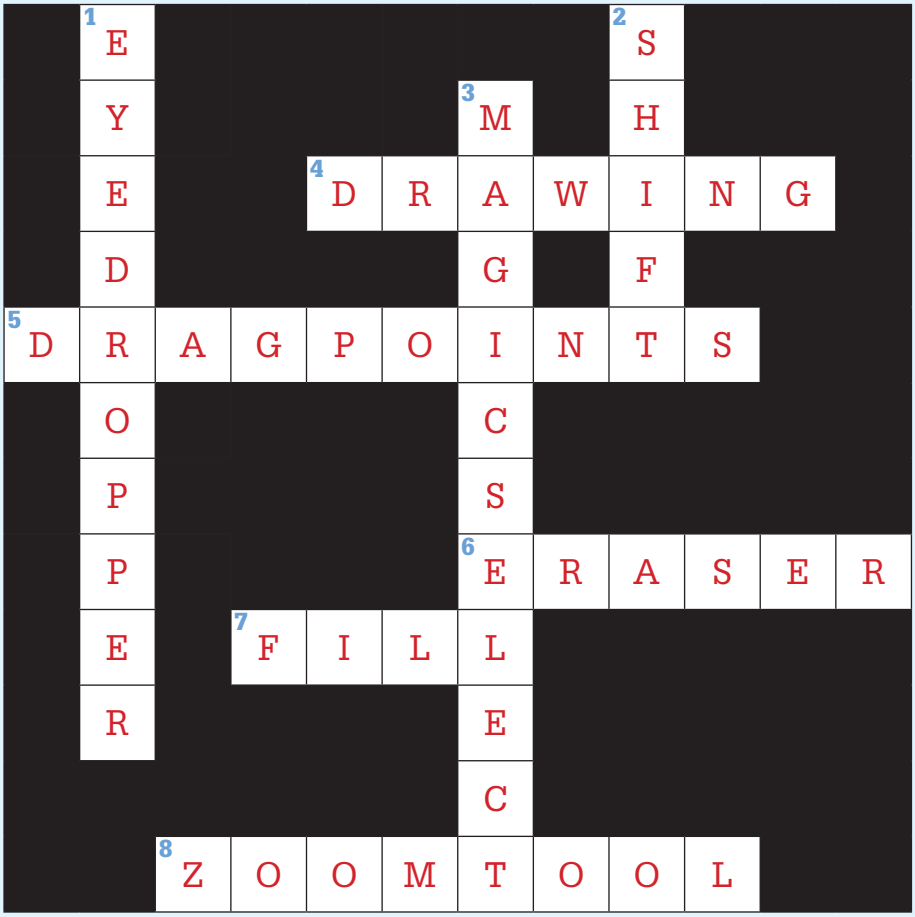
You can use the eyedropper to 'pick up' colours that you have already used.

Research question

There are other graphics packages available that allow you to do much more with your graphic than can be accomplished using Paint 3D. Do research and list at least three of these graphics packages.

Students' answers will vary. Examples are SketchUp, ZBrush, Adobe Dimension, Artist3D, AssetForge and so on.

Crossword



Across

4 Area used to create or customise your image

5 Curve a line upwards or downwards by pulling on these (2 words)

6 Tool that removes part of or entire graphic

7 Tool that applies colour to a large section of the graphic

8 Tool that magnifies your image (2 words)

Down

1 Can be used to pick up colours that you have already used

2 Holding down this key while drawing a line gives you a line at a 45° angle

3 Tool that outlines a selected part of the image and lifts it out of the graphic (2 words)

STEM project

Physical Education and sports play an important role in your school's curriculum since a few well-known international sports people in track and field, football and cricket were former students at your school. Your Physical Education (PE) teacher has asked your class to create a timeline highlighting the achievements of one of the internationally acclaimed athletes from their school days to the present. The timeline can be in black and white or full colour and must have relevant graphics.

1. List at least five important Paint issues you will have to consider while producing this timeline.
2. Write a short paragraph on your experience of working with your classmates on this project.
3. Ask an adult to evaluate your timeline before you present it to your PE teacher. What suggestions did they make?
4. List three major challenges your class experienced while producing this timeline. How did you overcome these challenges?

Hints

1. What is a timeline? Why do you think it is appropriate for this project?
2. What types of research did you do to source your information, for example, interviews, checking school yearbooks, newspaper articles, and so on?
3. Ensure that all class members participate by appointing a lead person to delegate work to each classmate. Why did you choose this particular person to be the lead?

Students' group answers for questions 1 to 4 will vary. Before they start, remind them to read the hints that have been provided.

1. Check students' knowledge of potential Paint issues that they will have to consider.
2. Check that student's paragraphs are explained well and make sense.
3. Discuss the suggestions with the class, to see how students reacted and if the suggestions were valid or not.
4. Discuss students' major challenges while producing the timeline and how they overcame these challenges.

Questions and answers 9

Copy and fill in the blanks questions

Use these words.

frames	placeholders	template	design

1 Publisher uses blocks called **frames** or **placeholders**.

2 A **template** is a pre-formatted **design** layout of a page.

True or false questions

1 A frame can hold only text. **False**

2 The zoom controls allow you to adjust the viewing size of your publication. **True**

3 A text box is a type of frame. **True**

4 You cannot change the size of a frame, or move a frame. **False**

5 A publication layout cannot be changed **False**

Multiple-choice questions

Choose the **best** answer to each question.

1 From which tab can you select a font scheme?

a Insert **b** File

c Page design **d** View

2 From which tab can you select a colour scheme?

a Insert **b** File

c Home **d Page design**

3 Microsoft Publisher organises information in:

a pictures. **b frames.**

c jobs. **d** texts.

4 Which of the following can be produced by desktop publishing software?

a Magazine **b** Menus

c Books **d All of the above**

Short-answer questions

1 List three well-known DTP software packages.

Well-known DTP software packages:
- Microsoft Publisher
- Adobe® PageMaker®
- Adobe® InDesign®,
- Adobe® FrameMaker®
- QuarkXPress.

(Any three)

2 Explain one limitation of using Microsoft Word or another similar word processor to produce DTP publications.

Word has difficulty in designing some products that could be easily produced with specialist DTP software.

3 List at least six publications that can be produced using DTP.

Examples of publications that can be produced using DTP:
advertisements, booklets, books, brochures, calling cards, flyers, forms, invitations, leaflets, magazines, manuals, menus, newsletters, postcards/greeting cards, posters, programmes, reports, résumés.

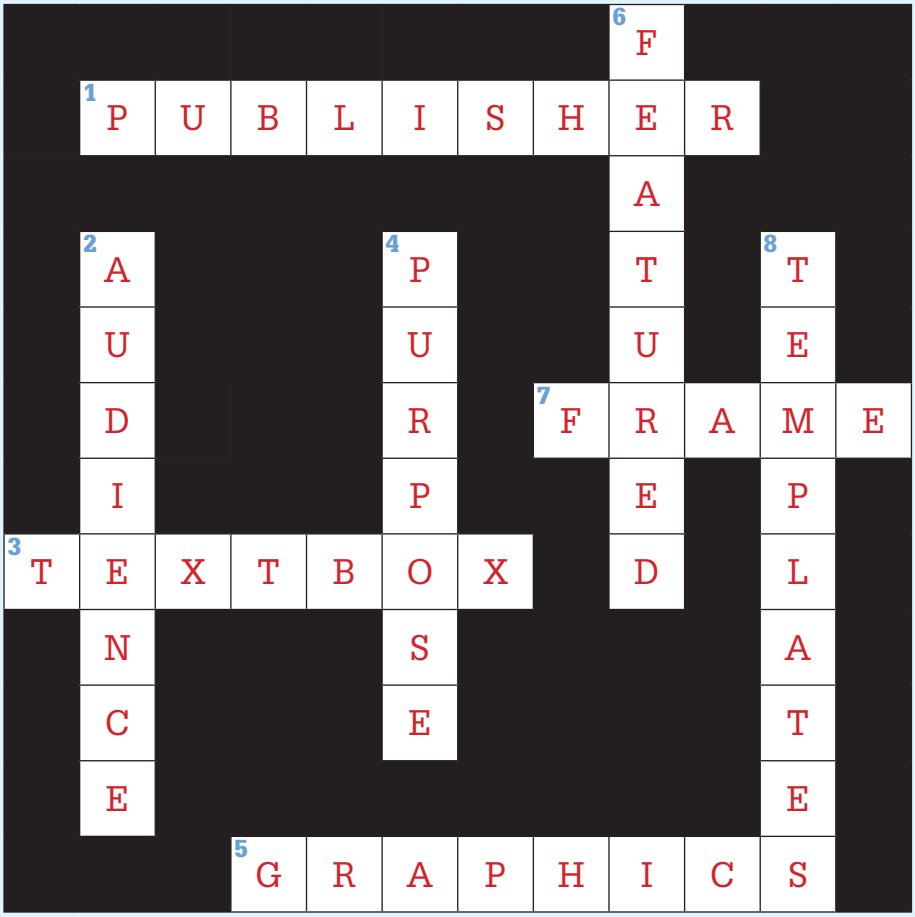
(Any six)

4 Your neighbour is selling his kittens and has posted flyers in the neighbourhood. A copy of his flyer is shown. Identify four features that can improve the flyer. Redesign the flyer using Microsoft Publisher.

Students' answers and redesigned posters will vary.
Examples of features to improve the flyer could include making a checklist of the elements to be included in the publication (and students could comment on these points in their criticism of the 'Cute kittens' flyer), as follows:
- purpose of the document
- audience and message
- template; if so, which one
- type of publication
- format, landscape or portrait
- fonts to be used, font scheme, size
- colours to be used, colour scheme
- appropriate graphics
- graphics size(s), clear for viewing, easy to understand
- borders to be used or not.

(Any four)

Crossword



Down

2 Knowing this will guide you in the level of language and vocabulary to use in your publication

4 Knowing this will guide you in how much and what type of information to include in your publication

6 Selecting this publications option provides various templates that form the layout for your publication

8 Using one of these is an option or you can start your publication from scratch

Across

1 Specialist DTP software

3 You enter your text into this

5 Using this in your publication can enhance and explain your message

7 Any object or text is enclosed by this

STEM project

Your school plans to hold an Open Day in one month and the principal has asked your class to design a programme brochure, which must include a few achievements of former school students. This brochure will be given to all members of the community who attend, to help build community pride and support for future school activities.

Several former students have received international recognition in the fields of sports, science, entertainment and art. You are selected to be the lead person on this project. You may include the timeline that you worked on in the Chapter 8 STEM project.

1. Select at least three appropriate brochure formats and briefly describe each one.
2. Select the most appropriate brochure format to use. Which process did your class follow to select this particular brochure format? Write a brief outline of this process.
3. How do you and your classmates plan to approach producing this brochure? List at least five features you intend to have in the brochure and the IT techniques that you will use to produce each one.
4. You and a group of your classmates produce an electronic version of the brochure and ask another group to critique it. List the comments they make about the brochure.
5. Based on the comments that you received, do you need to re-examine any parts of the brochure, before you show the final version to your principal? What improvements do you intend to make?

Hints

1. What is a brochure? Make a shortlist of the most important features of a brochure.
2. Brainstorm ways to produce this brochure with your classmates and list all ideas.
3. Review the topics necessary to producing the brochure before you start working on it.
4. List all assumptions, for example, budget, time constraints and printing method.

Students' group answers for questions 1 to 5 will vary. Before they start, remind them to read the hints that have been provided.

1. Check that students know three appropriate brochure formats and describes each one in simple language.
2. Are all students able to make the connection of what are appropriate brochure formats to use? Check students' brief outlines.
3. Students should list at least five features that they intend to have in the brochure and the IT techniques that they will use to produce each one.
4. Students are required to produce an electronic version of the brochure and ask another group to critique it. They should list the comments made.
5. Check with students, based on the comments they received, if they need to re-examine any parts of the brochure, before showing the final version to the principal. Discuss any improvements that students wish to make.

Questions and answers 10

Copy and fill in the blanks questions

1 **Pseudocode** is an **algorithm** that models or resembles a real program written in a particular programming language for the computer.

2 A series of coded **instructions** for the computer to obey in order to solve a problem that can be executed by the computer is called a **computer program**.

True or false questions

1 A pseudocode is an algorithm. **True**

2 A problem is a computer program. **False**

3 One of the steps involved in solving a problem is analysing the problem. **True**

4 We can use the 'Five Ws and How' question chart to define a problem. **False**

5 After following an algorithm, we do not arrive at a solution to a problem. **False**

Multiple-choice questions

Choose the **best** answer to each question.

1 We use the inverted triangle to:

a analyse a problem.
b consider different ways of achieving the result.
c define a problem.
d develop an algorithm.

2 The ingredients/item chart tool is used to:

a analyse a problem.
b develop an algorithm.
c sequence a problem.
d draw a conclusion.

3 A specific rule for writing a particular computer language is called:

a an algorithm.
b syntax.
c program language.
d a solution.

4 A pseudocode is:

a a computer program.
b syntax.
c a problem.
d an algorithm.

5 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.

Short-answer questions

1 Everyday problems can range from simple to complex. List four common problems and explain why you think they are simple or complex.

Students' own answers

2 Write two ambiguous problems. Redefine these problems so that they are not ambiguous.

Students' own answers

3 Explain how you can use the idea web tool to analyse a problem.

The idea web tool allows us to list all the different options for a problem.

4 State the steps in problem solving.

Steps in problem solving:
- Start with a clear understanding of what the problem is.
- Analyse the problem, that is, determine what we need to do to solve the problem.
- Decide what results we want to achieve.
- Consider different ways to achieve our result, and select the best option.
- Develop a method or algorithm to solve the problem.

5 Explain the difference between an algorithm and a pseudocode.

- An **algorithm** (method) is a set of instructions that are used for solving a problem. A good algorithm is exact, with no uncertainty about what to do next. It has a logical sequence, with a fixed number of instructions to be carried out in a specific order. It has a finite number of inputs and one or more outputs. An algorithm is finite, so eventually comes to an end after a fixed number of steps. It is effective, with steps that are doable. It is efficient, meaning that the instructions or steps allow the algorithm to run in the minimum amount of time and space on the computer.
- 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.

6 Explain why an algorithm would not be executed by a computer.

The number of steps is ambiguous; a computer needs to know the exact order of steps to perform.

7 What is a computer program?

A **computer program** can be executed by a computer. It is a series of coded instructions for the computer to obey in order to solve a problem. The computer executes these instructions (obeys these instructions) when told to do so by the user.

8 In your own words, explain the term 'syntax'.

Algorithms, pseudocode and computer programs are written using specific rules and statements of the computer language that is being used – similar to English grammar rules. The specific rules for writing in the particular computer language are known as **syntax**.

Problem-solving questions

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 Recording a show from your television.

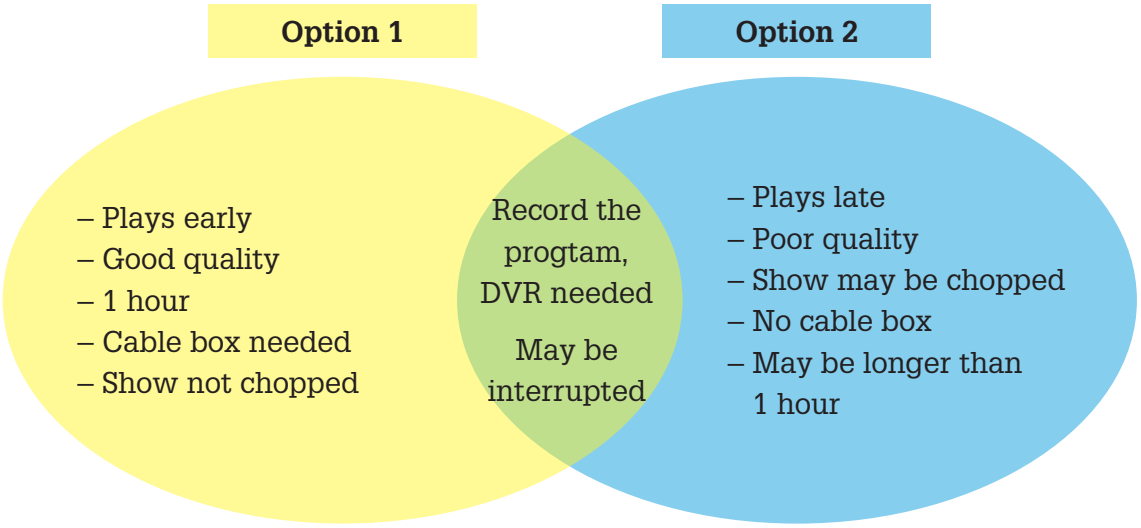
Possible solution – Algorithm development to define the problem

Analysing the problem using an Option Results chart

Possible options	Possible results
1. Local TV	**Program quality may be lower**, as program may have been recorded earlier then shown on local TV
	Long local ads may chop off some of the show if program is shown at the same time that it shows on a US channel
	May play later than when it was first accessed from a US TV channel
	Show may be more than an hour if long local ads are included when it plays later
	Later show can be recorded if earlier showing was missed
	Cable box may not be needed
	DVR needed
	Show may be suspended due to local event
2. Cable TV	Good-quality program; shown directly from CBS
	Lasts for no more than 1 hour
	Ads do not affect the length of the show and does not chop off
	Ads do not chop off parts of the show
	Plays earlier in the day
	DVR and Cable subscription needed
	May be shortened by breaking news

Results

What to do:	Record a good quality program
What program:	'Let's Make a Deal'
Where to save:	On my computer
What time:	Before 6 p.m.
How long:	1 hour



Option 1 is a better choice.

Algorithm using the Sequence Chart tool
Problem: Record with good quality, the TV program 'Let's Make a Deal' in full for 1 hour, to my computer on Friday 19 May, 2019

On Friday 19 May:

1. Connect DVR to cable box and to the computer.
2. Next, turn on all three devices.
3. Next, use the cable box to find the program guide.
4. Next, select the program 'Let's Make a Deal' from the channel CBS.
5. Select Record.

3 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.

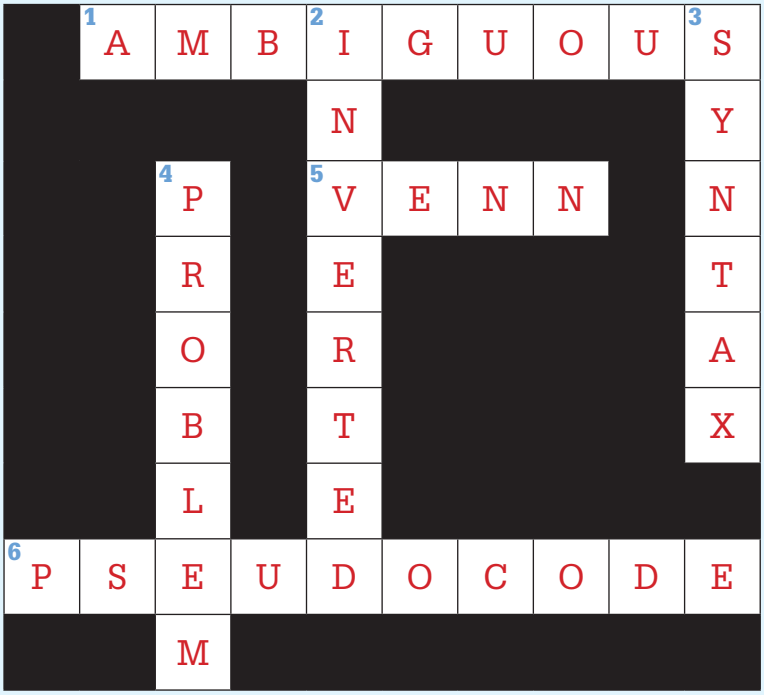
4 Calculating the total income from patrons attending a cinema show

Check students' steps to see if they understand what needs to be done. Are the steps logical? Offer guidance as needed.

5 Burning a music CD

Check students' steps to see if they understand what needs to be done. Are the steps logical? Offer guidance as needed.

Crossword



Across

1 A problem that leaves you confused about what is required is called an _____ problem.

5 A diagram tool used to consider different ways to achieve a result or select the best option

6 A code that resembles a real program

Down

2 In defining a problem you can use an _____ triangle tool.

3 Specific rules for writing in a particular computer language

4 Any task that requires a solution

Scenario questions

Analyse these scenarios and come up with the best option or solution using the tools in this chapter.

1. The bell has rung for lunch; you cannot wait because you are starving. You reach into your bag to get your lunch, but it is not there. You probably left it at home. You only have $2.00 more than the taxi fare needed to travel home.
2. You woke up 30 minutes late, as your alarm never went off. You need to get to school on time because you have an important exam to write.
3. Your class has been rated as the most untidy classroom in the school for the past year. You and your classmates want to change that.
4. You are a chef at a popular new restaurant. A customer who is vegan asked the waiter for a specific dish that you do not have the ingredients to make.
5. Your kitchen is a mess. Almost every utensil is dirty. You want to prepare something to eat. The only clean items are your mother's wedding china.
6. You invited three close friends to dinner and to watch a movie with you at home. However, they each invited two of their friends. You have only enough food for five people.
7. You want to tile your home, your bedroom, the living room and guest bedroom. You have the option of tiling all, two or only one room. However, the tile you like is quite expensive. Using this tile, you will be only able to tile one room with the expensive tile, purchase the cheaper tile for one other room and pay for labour for tiling one room. Selecting the cheaper tile would allow you to purchase tiles for three rooms in your house and pay for the labour to tile two of the rooms. What would be your best solution? Explain your answer.

Students' options or solutions to each scenario in questions 1 to 7 will vary. Check their understanding and help anyone who may be struggling.

STEM project

Every year, low-lying parts of your country are affected by floods in the rainy season. Many people living in flat houses suffer severe discomfort and loss. The river on the edge of your village is filled with silt and plastic cans and bottles. Some villagers are talking about moving out or building an upper floor to their homes. You are hired as a student advisor to the chief executive officer (CEO) of the Environmental Regulatory Agency (ERA).

1. What are the main problems facing the villagers? Write down at least three problems.
2. What are the likely causes of each problem that you have identified?
3. Select what you think is the major problem facing the villagers and develop a method/algorithm to solve this problem.
4. What do you expect to happen as a result of the solution? Use an appropriate media tool to illustrate the expected results. Advise on how soon the community could look forward to seeing the effects of your solution.

Hints

1. What are the reasons for flooding?
2. What are suitable processes that can be used to lessen or solve the flooding? What research did you do to locate these methods, for example, internet research, newspaper articles, interviewing of drainage engineer, and so on?
3. Summarise the major points in this chapter in your own words to use as a checklist while working out your solution.

Students' answers for questions 1 to 4 will vary. Before they start, remind them to read the hints that have been provided.

1. Check that students have been able to identify at least three problems facing the villagers.
2. Check that students have explained the likely causes of each problem clearly.
3. Check students' method/algorithm for their selected major problem facing the villagers. Guide any students who may have had difficulties.
4. Check that students know how to use an appropriate media tool to illustrate the expected results. Check also, that students can advise how soon the community could look forward to seeing the effects of their solution.

Questions and answers 11

True or false questions

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

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

3 Virtual reality systems are fictional systems that are only spoken about in movies. **False**

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

5 Computers affect all aspects of our lives. **True**

6 E-commerce has the potential risk of fraud. **True**

7 Telecommuting is also called tele-employment. **False**

8 CAM systems use robots and sensors in the manufacturing process. **True**

9 Voice recognition systems convert text to speech. **False**

Multiple-choice questions

Choose the **best** answer to each question.

1 Applications of computers in banking include all of the following except:

a ATMs. **b** EFT.

c CAI. **d** smart cards.

2 Computer-aided instruction includes all of the following except:

a tutorials. **b** drills.

c simulations. **d robotics.**

3 What does VR stand for?

a Very real **b** Virtual robot

c Virtual reality **d** Vast reality

Short-answer questions

1 What do the following stand for?

a CADD
b CAD
c CAE
d CAM
e CAI
f CAL

a CADD: Computer-aided design and drafting
b CAD: Computer-aided design
c CAE: Computer-aided engineering
d CAM: Computer-aided manufacturing
e CAI: Computer-aided instruction
f CAL: Computer-assisted learning

2 List three applications of IT in business and banking.

Applications of IT in business and banking:
- automated teller machines (ATMs), also called Automated banking machines (ABMs)
- debit cards
- smart cards
- credit cards
- stored-value cards
- electronic funds transfer (EFT)
- home and internet banking
- stock control
- e-commerce
- telecommuting.

(Any three)

3 Describe two uses of computers in smart homes.

Uses of computers in smart homes:
- light LED control
- thermostat control
- STB/TV control
- light control
- window control
- air conditioner control.

(Any two)

4 List your interactions with computer systems and microprocessors during a normal day, from the time you wake up until you go to bed.

Students' interactions will vary. Examples could include:
- using computer systems for education and entertainment
- seeing their parents using systems for security or home office
- using a remote control for the TV
- an iPhone/cell phone after school or on the way to and from school
- computer/iPad, etc. at school or after school to do homework/work at school/ look up information/research for projects.

Crossword

Down

1 This technology uses sensors to detect physical changes in the environment such as in pressure, light and sound

2 Free or paid online course

5 The electronic movement of funds from one account to another

6 The field involving computer-controlled machines

Across

3 These systems include voice recognition, voice synthesis and language comprehension systems

4 An ATM card (2 words)

7 A card that contains wafer-thin memory chip (2 words)

8 Buying, selling, marketing or servicing products or services online

STEM project

Brian, one of your classmates, studies and uses the internet service at a Homework Centre after school until either of his parents finishes work and can collect him. His parents have told him that they are concerned about his safety, but Brian thinks that they are more concerned that he will not focus on his studies if he is left unsupervised at home.

Brian, however, would much prefer to go home after school instead of staying at the Homework Centre.

You may ask your classmates to play the parts of Brian and his parents. What advice can you give to Brian based on what you have learned about the applications of IT in this chapter?

1. List all the safety concerns that you think Brian's parents may have.
2. How would you approach finding a solution that will allow Brian to go home after school?
3. Describe the steps you will take to find three possible solutions. Remember that you must address all of Brian's parents' safety concerns in your proposed solutions.
4. Create electronic outlines of the three possible solutions. Ask Brian to select the solution he prefers.
5. Select a suitable method for presenting Brian's selected solution and prepare a presentation.
6. What feedback did you receive from Brian's parents?
7. What improvements can you make to your presentation from the feedback received?

Hints

1. List the relevant applications of IT to use in your solutions.
2. Which IT hardware and software will you use for your presentation, for example, a tablet, phone or computer?
3. When and where will you do your presentation to ensure that it is received favourably?
4. Your solution must be attractive and workable for Brian and his parents.

Listen to students' during the role play; then check their answers, which will vary among students. Before they start, remind them to read the hints that have been provided.

1. Check students' knowledge and understanding of safety concerns that the parents might have.
2. Check students' approach to finding a solution that will allow Brian to go home after school.
3. Check students' steps to finding three possible solutions. Have they addressed all of Brian's parents' safety concerns in their proposed solutions?
4. Have students been able to create electronic outlines of the three possible solutions?
5. Check students' presentations for clarity and understanding.
6. Check students' feedback. Do they understand all the comments and how these could help or are complimentary?
7. Did students state clearly what improvements they can make to their presentations?

Questions and answers 12

True or false questions

1 Computers can allow people to have unlimited access to computerised resources. **True**

2 Many jobs previously done by humans are now done by computers. **True**

3 'Techno-trash' means talking trash (saying mean things) over the internet. **False**

4 Workers do not need to be retrained to work with computers. **False**

5 Cybercrimes can cost companies a lot of money. **True**

6 Telecommuting is also called tele-employment. **False**

7 It can be difficult for companies to keep up to date with software and hardware. **True**

Multiple-choice questions

Choose the **best** answer to each question.

1 Which of the following is NOT a negative impact of computers?

a Environmental waste **b** Computer crimes

c Digital divide **d Change in work patterns**

2 Poor communication as a result of computer use can cause all these problems except for:

a misunderstandings. **b** anti-social behaviour.

c an inability to express ourselves face-to-face.

d understanding.

3 The positive impacts of computers include all except for:

a computer waste. **b** a change in job skills.

c new job creation. **d** multitasking and multiprocessing.

4 Multitasking is:

a when computer-controlled machines perform repetitive tasks.

b when individuals work from home.

c doing many things at the same time with speed, efficiency and accuracy.

d when a computer communicates with us instantaneously.

Short-answer questions

1 Explain one way in which the speed of technology changes affects us.

It can be difficult to keep up to date when software and hardware changes very quickly.

2 List three negative impacts of computers on our society.

Negative impacts of computers on our society:
- the digital divide
- the loss of jobs
- computer crimes
- fast-changing technology
- computer illiteracy
- environmental waste
- poor communication
- health problems.

(Any three)

3 Discuss ways to bridge the digital divide between the haves and the have-nots.

Examples of ways to bridge the digital divide between the haves and have-nots is via computers and training in schools, adult computer literacy training, free access to computers in libraries, community centres, and free WiFi access in public places.

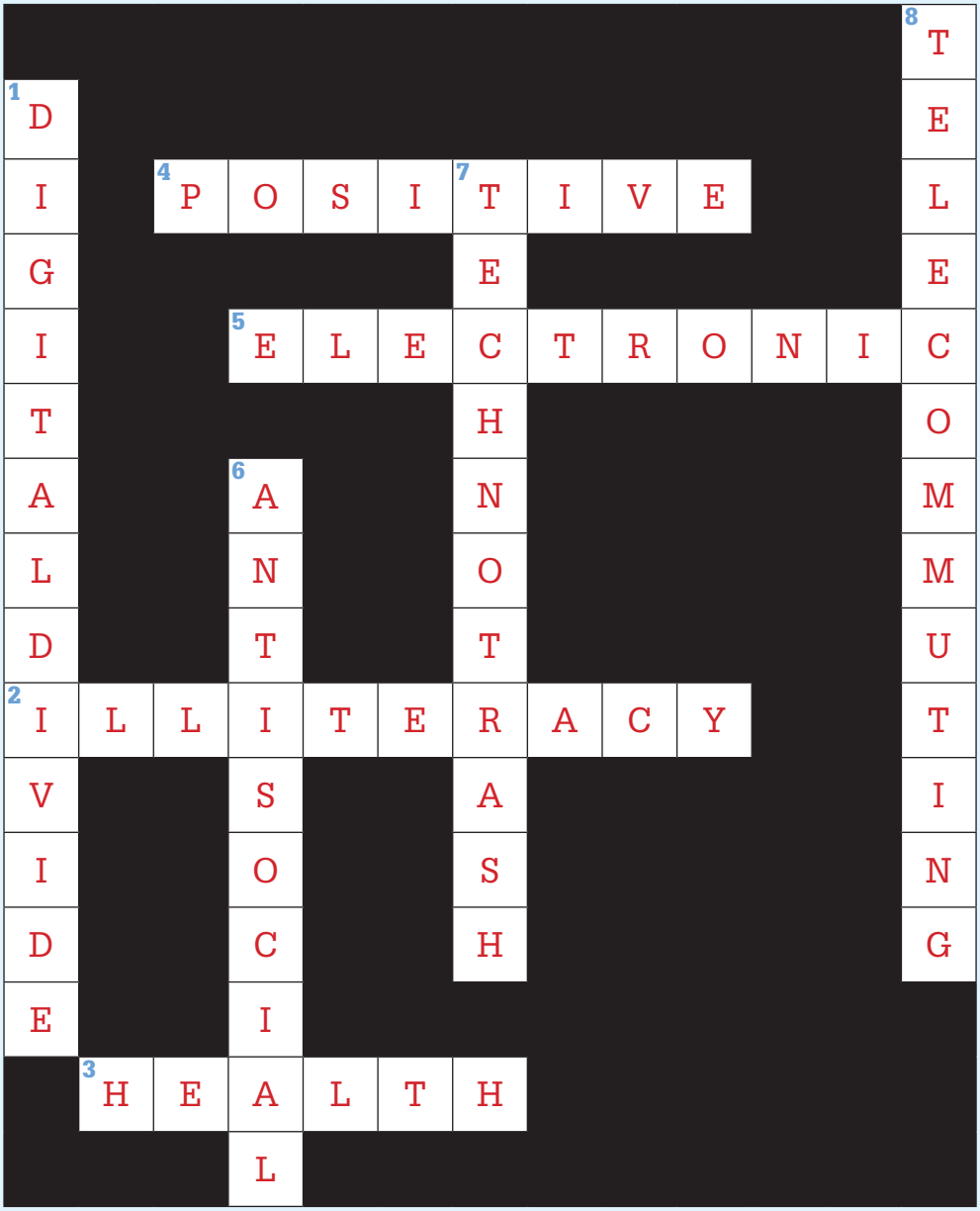
4 Your friend says she can communicate better using a computer. You believe this is true, but you also believe that it can have a negative impact on how we communicate with others. Explain your position to your friend, using examples to justify your point of view.

Students should re-read the sections about the negative effects of computers before attempting this question.

Positive impacts: increased job efficiency and automation, access to computerised resources, changes in work patterns/job skills, improved communication, improved information storage, access and use, etc.

Negative impacts: computer crimes, the digital divide, poor communication leading to anti-social behaviour, depression and lack of self-esteem, fast-changing technology (with which we cannot keep up), loss of jobs, impact on health, etc.

Crossword



Down

1 Social inequality caused by the inability to access and use computers and related technologies (2 words)

6 A type of behaviour promoted by the continued interaction with others only through computers

7 One of the names given to environmental waste from computers

8 Working at home away from the office

Across

2 Computer _____ is the term used when people do not understand how to use computers.

3 Repetitive work for long hours on the computer can affect your _____.

4 The impact is said to be _____ when computers provide benefits to our society.

5 The disposal of unwanted computer parts is called _____ waste.

STEM project

Continuing with the STEM project scenario from Chapter 11, your presentation managed to convince Brian's parents to install certain computerised devices at home, but they are still debating whether or not to allow Brian to stay home alone. However, Brian's father has now been offered the opportunity to either work flexible hours or telecommute. Use your new-found knowledge from this chapter to further advise Brian and his parents on a win-win situation for everyone. You may use your classmates to play the parts of Brian and his parents.

1. Write a clear statement of what you would expect your advice to achieve for both Brian and his parents.
2. What are the major issues in this situation? Give reasons for your answers.
3. Describe the steps you will take in planning your additional advice.
4. Prepare an addition to your previous presentation to show to Brian and his parents, using the same or another appropriate media tool.
5. After presenting your advice and receiving feedback, describe the areas of your presentation that you plan to improve.

Hints

1. Interview Brian and his parents separately to analyse what each person sees as the best solution.
2. Which parts of your previous presentation can you reuse in preparing your new presentation? Which parts must be changed?
3. Is your advice realistic and workable for both Brian and his parents?

Students' answers for questions 1 to 5 will vary. Before they start, remind them to read the hints that have been provided.

1. Have students written a clear statement of what they would expect their advice to achieve for both Brian and his parents?
2. Have students been able to pinpoint the major issues in this situation? Check that they have given reasons for their answers.
3. Check that students have described the steps they will take in planning their additional advice.
4. Assess students' addition to their previous presentation.
5. Check that after presenting their advice and receiving feedback, students were able to describe the areas of their presentations that they planned to improve.

Questions and answers 13

Copy and fill in the blanks questions

Use these words.

web-page designer	data security analyst	computer operators
data entry operator	webmaster	internet traffic

1 Web pages that are built using HTML and Java are produced by a **web-page designer**.

2 A **data entry operator** enters data into a computer system from source documents.

3 A **data security analyst** ensures that all information held by a company is secure.

4 A **webmaster** is an internet specialist who is responsible for monitoring internet traffic.

5 Starting up and shutting down systems are the responsibilities of **computer operators**.

True or false questions

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

2 ICT affects all aspects of our lives. **True**

3 A good web-page designer must have experience as a graphic artist. **False**

4 Computer engineers are responsible for repairing computer hardware and selling computers to clients. **False**

5 Programmers modify, update, repair and design programs. **True**

Multiple-choice questions

Choose the **best** answer to each question.

1 Computer programmers:

a write programs.

b perform dangerous jobs that cannot be done by a computer.

c identify and evaluate potential hardware and software.

d maintain and protect the company's programs and data.

2 An IT manager is responsible for:

a designing web pages.

b planning, coordinating, managing and staffing of the IT department.

c monitoring time spent by customers on the computer.

d monitoring and controlling the central computer system.

3 A data security analyst:

a looks after the protection and security of a company's data.

b is responsible for keeping information safe from floods, fire, power outages, fraud, theft, invasion of privacy and viruses.

c ensures that there are no security loopholes.

d all of the above.

4 This job usually requires a degree in computer engineering, or in electrical and computer engineering:

a Programming engineer

b Computer engineer

c Programmer

d Webmaster

5 Which one of the following is NOT a job function of an operations manager:

a Supervising the use and maintenance of the computer equipment

b Supervising the receiving and preparation of data

c Design components, test them and assemble them

d Scheduling processing activities

Short-answer questions

1 List three specialist IT jobs and explain what these jobs entail.

Examples are as follows:

- **IT (data processing/ICT) manager** – responsible for planning, coordinating, managing and staffing the information technology department of a large organisation
- **Database administrator (DBA)** – responsible for the administration and management of a company's database
- **Systems analyst** – in charge of developing a system from start to finish
- **System administrator** – responsible for creating, managing and securing computer systems in an organisation
- **Programmer** – writes programs according to specifications determined mainly by computer engineers or analysts
- **Operations manager** – in charge of daily operations of the computer department
- **Computer operator** – monitors and controls the central computer system (or console) by starting up and shutting down the system and responding to messages from the system
- **Data-entry operator** – enters data into the system from source documents
- **File librarian** – keeps all of the company's data files and software organised through the cataloguing and storing of tapes and disks
- **Data security analyst** – looks after the protection and security of a company's data; responsible for keeping information safe from floods, fire, power outages, fraud, theft, invasion of privacy and viruses
- **Website designer** – responsible for building and maintaining a website

- **Webmaster** – an internet specialist whose responsibilities range from monitoring internet traffic on the web server to answering queries about the website's operations; duties may include those of a web-page designer, with added emphasis on maintenance, expansion and improvement of existing web pages and websites.

(Any three)

2 What are the job qualifications for a system administrator?

A system administrator is responsible for creating, managing and securing computer systems in an organisation.

3 What skills must someone possess to become a computer engineer?

A computer engineer's qualifications usually require a degree in computer engineering, or electrical and computer engineering.

4 Create a table to compare the job roles and function of a web designer and that of a webmaster.

Comparison of job roles and function of a web designer and a webmaster

Category	Web designer	Webmaster
Job roles and function	Responsible for building and maintaining a website; graphic art experience an advantage (many regard this job as combining being artistic and able to program); consultation with graphic artists when developing websites	An internet specialist whose responsibilities range from monitoring internet traffic on the web server, to answering queries about a website's operations; may also perform the job functions of a website designer or developer, with added emphasis on maintenance, expansion and improvement of existing web pages/websites
Qualifications	No formal qualifications for designing websites, but a background in programming will help, since some developers choose to create sites using computer languages such as HTML, Java and PHP directly	Needs both technical and management skills; can include webmaster certification courses, and a degree in management information systems or equivalent, if she or he is managing an extremely large website for a big organisation

Research questions

1 Do research to find out about two other IT specialist jobs. Write a summary of your findings in your notebook.

Students' research will vary.

2 Research and make a list of the most popular IT jobs in your country at this time. Some useful places to conduct your research would be small and large businesses, computer sales and services companies, banks, government offices and accounting firms.

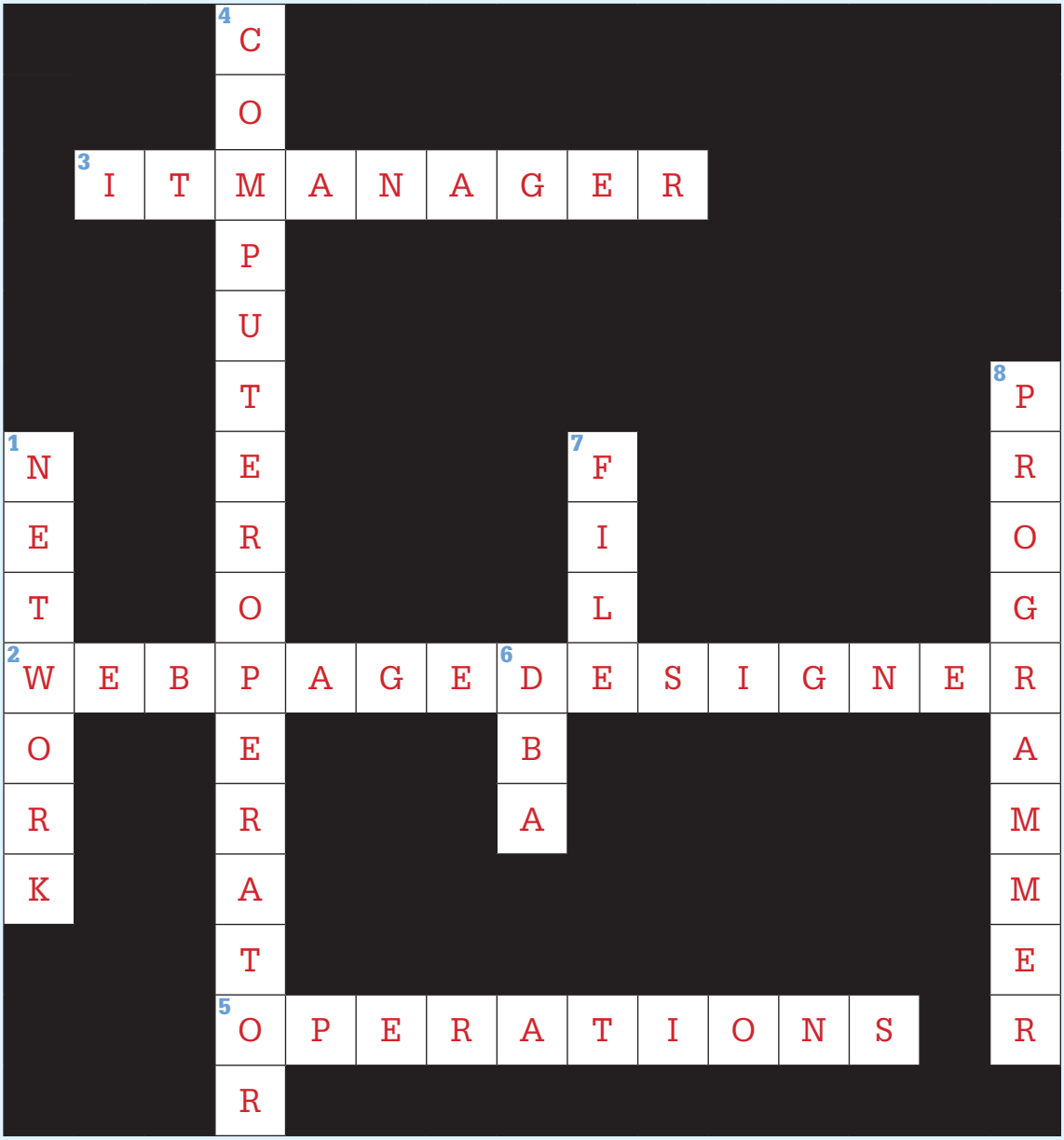
Students' research will vary.

Project

Create a Career fair booth for your company with five traditional ICT jobs. This booth must contain flyers advertising each of the jobs, a newsletter containing all five jobs with the job function and qualifications required for the job and an application form for individuals to apply for one of the jobs.

Students' Career fair booths will vary. Check to see that they are able to create presentable and eye-catching flyers, interesting newsletters and application forms that, once completed, will have all the information an interviewer will need in order to be able to make a decision as to whether the candidate is suitable or not.

Crossword



Down

1 The administrator who manages access to various computer files and enforces rules on the changing of passwords

4 The person who monitors and controls the central computer system by starting it up and shutting it down (2 words)

6 The person who manages a company's database (abbreviation)

7 A type of librarian who catalogues tapes and disks

8 The person who writes, updates, repairs, modifies and expands existing programs

Across

2 A person who usually has a background in HTML, Java or PHP and some artistic ability (2 words)

3 The person who plans, coordinates, manages and staffs the information technology department of a large organisation (2 words)

5 The manager responsible for supervising the use and maintenance of computer equipment

STEM project

You have been hired as a student adviser by the Caribbean Robotic Building Company (CRBC), an entrepreneurial venture of a group of Caribbean IT experts. You have been asked to prepare a presentation on the job functions students can perform at this company during their July–August vacation. You will be presenting to the Board of Directors, before a final decision is made on temporary staffing positions. You will consult with your classmates to ensure you produce a comprehensive, winning presentation since you all would like vacation work at this company.

1. List the skills students in your class have acquired through studying IT at school.
2. Identify at least five jobs which you consider crucial to this company and which you and your classmates can do. Write a brief description of the knowledge, skills and competencies required to do these jobs.
3. Write the steps you would take in preparing your presentation.
4. Produce your presentation and ask your classmates to give you feedback on it. What feedback did you receive?
5. Based on feedback, how do you plan to adjust your presentation?

Hints

1. Do you have a complete list of the skills of your class members?
2. What is a job description and why is it important? What are the key features in a job description?
3. Is your presentation clear and simply presented?
4. Did you obtain sufficient ideas and feedback from your classmates? If not, what can you do to improve this for future project work?

Students' answers for questions 1 to 5 will vary. Before they start, remind them to read the hints that have been provided.

1. Check students' lists of the skills they have acquired through studying IT at school.
2. Make sure that students can identify at least five jobs that they consider to be crucial to the company and which they and their classmates can do. Check students' brief descriptions of the knowledge, skills and competencies required to do the jobs.
3. Check that students understand the steps they would have to take to prepare a presentation.
4. Checks students' comments about the feedback they received.
5. Discuss how students plan to adjust their presentations.