

Information Systems for you

Teacher Support Pack Answers

Chapter 1

- 1 Boxes should be in the order DATA PROCESSING INFORMATION
- 2 Raw **data** is **processed** to provide information.
- 3(a) They would need to still keep information about those pupils who have left the school.
(b) The school would probably store the cards in alphabetical order according to surname. To put them into form order it would be necessary to read through the cards and write down the details for those pupils in the same form.
- 4(a) Less expensive to set up.
Minimum staff training needed to use it.
Do not have to worry as much about losing the data accidentally.
(b) Takes up less space compared to rows of filing cabinets.
Can produce mail-merged documents using the data held.
Data can easily be put into any order.
(c)(i) A teacher may need a picture to help them give a report on a particular pupil.
It would be useful to have a picture if the pupil had been involved in some sort of trouble.
(ii) A digital camera.
- 5 The doctor who would have access to the patient's record from any part of the hospital. This would help the patient in an emergency as important details such as medications and allergies are always immediately available.
The admin staff will no longer spend ages tracking down files. It will be better for the patient as files are no longer lost.

Chapter 2

Worksheet 2.1 page 7

1

Item	Hardware or software?
Floppy disk drive	Hardware
DVD film	Software
Blank CD	Hardware
Windows Millenium Edition	Software
Scanner	Hardware
Microsoft Office	Software
Digital camera	Hardware

- 2 Hardware are the parts of the computer that you can touch. Software is the name given to the programs that allow the hardware to do a useful job.
- 3 Computers are very fast
Computers are very accurate
Computers can keep large amounts of information in a small place
- 4 Loss of privacy as more information about us is kept and cross-referenced.
The use of computers may lead to health problems.
The use of computers can lead to job losses.
- 5 Sorting, Storing and Searching
- 6 Control unit
Arithmetic and logic unit
Immediate access store
- 7 Personal digital assistant, notebook computer, desktop computer, mainframe computer.
- 8(a) Storage outside the central processing unit.
- (b) A device used to get data/information out of a computer system (e.g. a printer, monitor etc.).
- (c) A device attached to, and under the control of the central processing unit.
- (d) A small computer that stores data in electronic circuits and is normally used to control a device.
- (e) Liquid crystal display. A type of computer screen that takes up less space than a conventional monitor.

Chapter 3

Student Activity 3.2

- 1 Optical character reader
- 2 Bar code reader
- 3 Scanner
- 4 Digital video camera/Web cam
- 5 Digital camera/Web cam
- 6 Optical mark reader
- 7 Magnetic ink character reader
- 8 Microphone
- 9 Touch screen
- 10 Keyboard
- 11 Microphone
- 12 Optical mark reader

Worksheet 3.1 page 13

- 1 Four input devices: Keyboard, Scanner, Magnetic card reader, Joystick

Four output devices: Printer, Plotter, Monitor, Loudspeaker

- 2 Following should be ringed:
Keyboard, Barcode reader and Optical character reader.
- 3(a) Optical character reader/recognition
Magnetic ink character reader/recognition
Liquid crystal display
Optical mark reader/recognition
- 4 Voice recognition
- 5(a) Each item on the list should have a box near it that could be shaded in.
 - (b) It is faster to input in this way rather than type it in.
The data is captured without the need for a human so it is cheaper.
 - (c) If a form is folded then it might jam the machine.
Older patients may not be able to understand what they have to do.
- 6(a) Magnetic ink character reader
 - (b) Microphone
 - (c) Digital camera
 - (d) Optical character reader or scanner
 - (e) Bar code reader
- 7(a) Dot matrix printer
 - (b) Ink-jet printer
 - (c) Laser printer
 - (d) Colour laser printer
- 8 Touch pad and keyboard
- 9 They take up less space on the desk.
- 10(a) A digital camera stores the image in memory rather than on a film.
There are no developing costs with a digital camera.
The image from a digital camera can be sent attached to an e-mail without the need for a scanner.
 - (b) The resolution is a measure of the number of pixels on the screen. The greater the number, the clearer the picture and the higher the resolution.
 - (c) No development costs and easier to store and manipulate the image.

Unravel the gobbledegook

- (a) You have to decide whether you want to print in colour or just black and white. If you want to print in colour then an ink-jet printer might be best. They are cheap to buy but the ink cartridges don't last long and are expensive. There are colour laser printers but these are several thousand pounds. Black

and white laser printers cost more to buy but their cartridges last a long time and so are cheaper to run. Lasers are faster.

- (b) Do you need to print in colour.
How much printing will you need to do.
What sorts of things will you be using the printer to print.
How much is your budget.

Chapter 4

Student Activity 4.1

- 1 $1.44 \times 1000 = 1\,440$ bytes
 $1.44 / 1000 = 0.00144$ gigabytes
- 2 $10/1.44 = 6.9$
7 disks would be needed.
- 3(a) JAZ drive (2000 Megabytes)
- (b) (i) $\text{Zip } 250/1.44 = 173.6 = 174$
(ii) $\text{JAZ } 2000/1.44 = 1388.9 = 1389$
- (c) Keeping an extra copy of the data away from the computer in case the data is stolen or damaged.

Worksheet 4.1

- 1 They need to explain how they will make another copy of the disk. This will depend on where the data is normally stored.
- 2 15 gigabytes is a large amount of data. Zip and JAZ drives are unsuitable because so many disks would be needed. A CD writer/re-writer could be used but typical storage capacities of 600 Mb will still mean 25 CDs would be needed. A removable hard drive would be the best option.

Student Activity 4.3

- 1 Floppy disks have a low storage capacity. DTP files can contain clip art, photographs etc and these files take up a lot of space. The floppy will soon become full, so another storage media is needed.
- 2 1.44 Mb
- 3 When compressed, the files do not take up as much space on the disk. When sent over the Internet they do not take as much time to transfer if they are compressed first.

Worksheet 4.2

- 1(a) 1000

- (b) 1 000 000
 - (c) 1 000 000 000
- 2 Random access memory (RAM)
Read Only Memory (ROM)
- 3(a) (i) Random access memory (RAM)
(ii) Read Only Memory (ROM)
- (b) RAM and ROM
 - (c) The data stored in RAM is lost when the power is switched off. With ROM, the data is retained.
- 4(a) Floppy disk
Hard disk
- (b) CD-ROM or DVD
 - (c) More modern. Higher storage capacity enables films to be viewed on the computer.
 - (d) (i) Floppy disk drive, Hard disk drive and Tape streamer.
(ii) Tape streamer
(iii) CD-ROM drive
- 5 DVD-RAM disks can be recorded onto many times. DVD-ROM is read only so you cannot alter the data on it. DVD-ROM is used to distribute movies.
- 6(a) Computer A
- (b) Able to have lots of programs/windows open at the same time.
Computer will process work quicker.
- 7(a) Two from: CD-RW, Magnetic hard disk, Magnetic floppy disk
- (b) Only suitable for large backups and the devices are not as widely used.

Chapter 5

Worksheet 5.2

- 1 Hardware are the parts of the computer that you can touch. Software is the name given to the programs that allow the hardware to do a useful job.
- 2 High level language Compiler Machine code
Assembly language Assembler Machine code
- 3 The following should be ticked:
Allocating space for files on the disk drive
Issuing an instruction to the printer to start printing
Managing the flow of data from a keyboard
Controlling the security of a system

- 4 The following should be ticked:
 Repairing damaged files
 Sorting data
 Backing up files
- 5(a) An appropriate operating system should be given.
- (b) Tasks such as:
 Formatting disks
 Organising where on the disk the data is to be stored
 Copying files
 Instructing the printer to start printing
- (c) On the hard drive (but part of it could be considered to be stored in ROM)
- (d) In RAM
- 6 COBOL

Need to complete these answers.

Teacher Support Pack Answers

Worksheet 5.2

- 7(a) A collection of application programs such as Microsoft Office, that share a set of common commands.
- (b) Because the commands are the same for each application, it is easier to learn.
- (c) They can be strong in one area but weak in another.
- 8 Menu-driven interface
 No graphics means the program is faster to load and run.
 Have to use the keyboard
- Graphical user interface
 Easy to learn and use
 Because of all the graphics, it takes longer to load
- Command-driven interface
 Quicker if you know how to structure the commands
 Have to learn a set of commands

9

Term	Definition
Multi-access system	A system which allows many different users to access a computer 'simultaneously'.

Interpreter	A program that converts high-level language instructions into machine code one instruction at a time.
Multitasking	The ability of a program to run two or more programs at the same time.
Compiler	A program that converts high-level language instructions into machine code all in one go.
Graphical User Interface	A way of the user communicating with the computer through windows, icons, menus etc.
Software	The programs that give the computer instructions about what to do.
Assembler	A program that converts assembly language into machine code

- 10 **Multiuser**
The ability of a system to allow more than one user access to the data at the same time.

Operating system

The software that controls the hardware and also runs the programs.

Multi-access

A system that allows many users to access the system 'simultaneously'.

User interface

The software that allows the user to communicate with the system.

General purpose package

Software that is not specific to a particular type of business.

Chapter 6

Worksheet 6.1

- 1 Code 1: Class codes in a school 1A (first year group A).
Code 2: Registration number of a code (tells details about where the car was registered, month and year).
- 2(a) They might make a mistake or it would take too long.
(b) Optical mark recognition
(c) Places responsibility on the person filling in the form to do it correctly.
- 3(a) Keying in data using the keyboard and then storing the data on a disk.
(b) The method that is used for the computer to obtain the data for it to process.
- 4(a) Voice recognition
(b) Microphone
(c) Allows people who are slow at typing to get data into the computer quickly.
(d) Needs lots of practice to use.

5

Application	The best method of data capture
Luggage handling at an airport	Bar code reading
Cheque clearing in a bank	Magnetic ink character recognition
Marking multiple choice answer sheets	Optical mark reading
Reading the details on a credit card	Magnetic stripe reading
Capturing the numbers on lottery tickets	Optical mark reading

- 6(a) Traffic control system
 (b) Would need a human to collect the data which would be very expensive.

Chapter 7

Worksheet 7.1

- 1(a)(i) Verification - Checking that there have been no mistakes during the entry of the data.
 (ii) Validation - A check performed by a program to detect any data that is inaccurate, incomplete or unreasonable.
 (b) After typing in the details, the data on the screen is proofread and checked to make sure that it is identical to the order.
 (c)(i) Product number should have a ring around it.
 (ii) It is quicker.
 (iii) Quantity
- 2 Details entered should be compared with those on the form (i.e. proof-read).
- 3(a) Ensuring that only numbers are entered in the product number and order quantity fields and that only letters are entered in the customer name field.
 (b) Order quantity to check that it is not less than or equal to zero or above a certain value.
 (c) Product number to make sure that this long number has been entered correctly.
- 4(a) A number placed after a string of numbers to check that they have all been correctly input into the computer.
 (b) To check that the details stored in a bar code have been entered correctly.
 To check that an account number on a cheque have been properly entered.

5

Name of validation check	Description of what it is designed to check
Range check	To make sure that a number lies within a certain range.
Data/character type check	Making sure that the right type of data is entered. For example numbers can only be entered into a numeric field.

Presence check	Ensuring that data has been entered into a field.
Check digit	A number placed at the end of a string of numbers to check that they have been correctly input into the computer. Ensuring that data has been entered into a field.
Hash total	A meaningless total of numbers used to check that all the numbers have been entered into the computer.
Lookup	Checks to make sure that the entered data is in a table or file.

6(a) A mistake when reading or typing data.
Example: Mistaking an S for a 5.

(b) Two digits have been swapped around.
Example: 123 instead of 213

7(a) $0 \times 10 + 0 \times 9 + 9 \times 8 + 1 \times 7 + 2 \times 6 + 9 \times 5 + 9 \times 4 + 3 \times 3 + 1 \times 2 = 183$
 $183/11 = 16 \text{ r } 7$
 $11 - 7 = 4$
Check digit X = 4

(b) Transposition errors can be checked. For example if the last two digits were swapped around the 1 would be multiplied by 3 and the 2 would be multiplied by 3 which would give an incorrect total and check digit.

Chapter 8

Worksheet 8.1

- | | | |
|---|---|---|
| 1 | 1 | A |
| | 2 | B |
| | 3 | C |
| | 4 | D |
| | 5 | E |
| | 6 | F |
| | 7 | G |

2(a) (i) A collection of records. For example the personal details of all the members.

(ii) A collection of fields referring to one person. The personal details of a particular person is a record.

(iii) A field is one item of information in a record. The surname of a member would be a field.

(b) Can sort the records according to any field.
It is quicker to search for specific information.

Altering a member's details is easy because you can simply alter or overwrite what is there.

- (c) If the computer breaks down or is stolen, the details will be unavailable. Users will need to be trained to use the system.
- (d) Date of birth
Title
Telephone number
- (e)

Title
Surname.....
Forename.....
Address.....
.....
.....
Date of birth / / ...
Telephone number.....

- 3(a) A copy of the data or programs so that the original data may be recovered should the original data be lost for some reason (fire, theft etc.).
 - (b) Only one backup is needed for the entire organisation.
 - (c) Files
Records
Fields
 - (d) Some files such as personnel files may contain confidential information (sickness details). This should not be made available to everyone.
- 4(a) One
 - (b) 8
 - (c) 200
 - (d) Surname order. If a member forgot their membership number they could easily find the record using surname.
- 5(a) Customer number
 - (b) New meter reading
 - (c) B
 - (d) 119
 - (e) It checks to make sure that the old meter reading is not greater than the new meter reading. If it was, the meter reading must have been turned back.
 - (f)(i) The control checks that all the meter readings have been processed. It would represent the total of all the electricity used by all the customers in the batch. The hash total checks that all the customer's readings have been processed.
 - (ii) A control total has a meaning whereas a hash total has no meaning.

Chapter 9
Worksheet 9.1

- 1(a) A device used to put the data into a form that can be processed by the computer.
- (b) The data on the payment slips would be read faster by an optical character reader.
- (c) Customer account number
Payment details
- (d) Customer address
- (e) To make sure that obviously incorrect data is not processed.
- 2(a)(i) Customer number order.
- (ii) So that the transaction file is in the same order as the master file.
- (b) If an order is made then the cost of the order will be added to the amount owing.
If a payment is made, then the amount owing will be reduced by the amount of the payment.
- (c)(i) Customer number
- (ii) The Transaction file
- (iii) Only those records where there is an order or a payment need to be read.
- (iv) Serial access
- 3(a) The data is accepted and processed immediately.
- (b) To avoid two different agents booking the same ticket.
- (c) A traffic control system
- 4(a) Goods are sold or are brought back or perhaps some are stolen. The stock position will therefore change during the day.
- (b) The following should be ticked:
A sale of a part is made
More parts added to stock
A part is returned
- (c) The stock on the computer will always show the true stock position.

5

Term	Definition
Multi-access	A network that allows lots of users to access the data and programs stored, simultaneously.
On-line	The term used when a device is connected to and under the control of the computer
Batch Processing	A method of processing where transactions are accumulated over a period of time. They are then sorted and processed together.
Multitasking	The ability of a computer to run two or more jobs at the same time.

Timesharing	The sharing of a computer between several users so that each user has part of the processing time.
Real time	A system that is able to instantly respond to an inquiry.
Multi-user	A program or operating system that allows more than one user at the same time.

Chapter 10

- 1(a) American Standard Code for Information Intterchange.
 (b) Paragraph alignment
 Using different fonts
- (c) 1 and 0
 (d) So that text can be transferred between different packages and the wordprocessing package.

2

Name of device	Analogue	Digital
Traffic lights		√
Dial speedometer	√	
A compass	√	
A watch with hands	√	
A watch with a number display		√
A clinical mercury thermometer	√	
A set of weighing scales with a dial	√	
A DVD player		√

- 3(a) An analogue device has lots of in-between positions (e.g. a dimmer switch) whereas a digital device (e.g. a light switch) can only have set positions (i.e. on and off in the case of a switch).
- (b)(i) compass, dial speedometer
 (ii)DVD player, traffic lights
- 4(a) The files take up less space when they are stored on disk.
 The time taken to send a file is less.
- (b) If a file is large it means that it can no longer be saved on a floppy. By compressing the file, it can be made to fit onto a floppy.

Chapter 11

Worksheet 11.1






- 1(a) A copy printed out on paper.
- (b) It costs money (paper, toner etc.) to print a copy out.

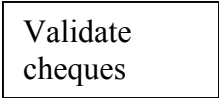
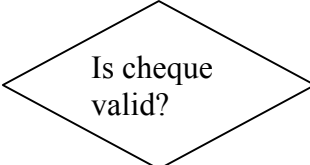
- 2(a) Software that combines more than one medium for presentation purposes, such as sound, graphics and video.
- (b) Speakers
Sound card
DVD

- 3 Large storage capacity
Most computers have a device capable of reading the disks
Cheap to buy

- 4 There is a search program to find the information quickly
You can use links to quickly move between the pages
The information is presented in a lively way using sound, video, graphics etc.

Worksheet 12.1

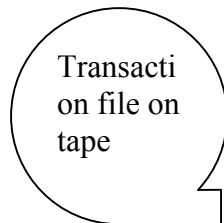
- 1(a) 
- (b) 
- (c) 
- (d) 
- (e) 

- 2(a) 
- (b) 

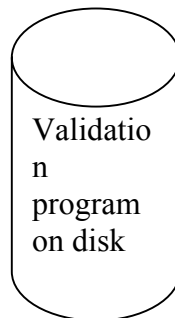
(c)



(d)



(e)



Chapter 13

Worksheet 13.1

1(a) Questionnaires

Used to ask questions about how the existing system works.

Observation

Used to observe the working practices and the existing systems in operation.

Inspection of records

Used to look at the existing documents used by the system.

(b) The cost/benefits of the new system

Alternative designs looked at

A description of what the system is designed to do

2 Analysis

Design

Testing

Implementation

Evaluation

3(a) Analysis

(b) Analysis

- (c) Design
- (d) Implementation
- (e) Evaluation
- (f) Testing

- 4(a) How to load the software
How to print the output
- (b) Printouts of program code
Flowcharts or dataflow diagrams

Chapter 14

Worksheet 14.1

- 1 Temperature
Atmospheric pressure
Rainfall
- 2 The person due to take the data may be off ill.
The data will need to be taken when the school is on holiday.
- 3(a) A system that automatically collects data over a certain period of time.
(b) Readings are taken at the right time
Readings are taken automatically
- 4(a) The logger might be located away from the computer.
(b)(i) The time over which the data is logged.
(ii) How often the readings are taken (e.g. every minute, every hour etc.).
- 5(a) Take data out of one application with the aim of putting it into another application.
(b) Spreadsheet

Chapter 15

Worksheet 15.1

1(a)

(b)

(c)

- 2(a) Networked computers are able to communicate with other computers. A stand-alone computer can only work on its own data and programs.
- (b)(i) Resources such as a printer, scanner etc. may be shared among the users. Easier to simply load the software on the server and everyone can gain access to it.
- (d) If the network fails then it will not be possible to access the data and programs stored on the server.

3

Term	Definition
EDI	A way of companies dealing electronically with each other
LAN	A small network that is usually confined to a single site
WAN	A network covering a wide geographical area
Modem	Device needed to convert the signals from the computer so that they can be sent along a telephone line
E-mail	A way of sending messages electronically from one computer to another

Test Your Knowledge

- 1 a
- 2 c
- 3 b
- 4 a
- 5 a
- 6 c
- 7 c
- 8 b
- 9 c
- 10 b
- 11 b
- 12 a
- 13 a
- 14 c
- 15 a
- 16 a
- 17 b
- 18 a

Chapter 16**Worksheet 16.1**

1

Description	Physical or software security?
Keypad on the computer room door	Physical
Password to gain access to a network	Software
Virus checker installed on all computers	Software
ID badges worn by all staff	Physical
Bolts or clamps to attach the computer to a desk	Physical
Smoke detectors installed in computer rooms	Physical
All disks brought from outside are scanned with a virus checker before being used	Software

- 2(a) They may not know who owes them money.
 (b) Have a keypad on the computer room door.
 Bolt computers to the desks.
 (c) Data can take a long time to re-create and this would be expensive because people would have to be paid to do this.
- 3(a) Makes sure that only the correct user is logged on under the user name.
 (b) Other people can sometimes get to know your password if it is used regularly.
- 4(a) A copy kept for security purposes.
 (b) If the computer and the backup copies are kept together, then if the computer was stolen, then they would steal the backups as well.
 (c) Jumbled up so that only the intended recipient is able to read its contents.
- 5(a) A nasty program that has been created to do damage to your computer system.
 (b) Virus checker
 (c) Do not allow users to download files off the Internet.
 Do not allow users to used unauthorised software (e.g. games) using the computer.
- 6(a) A piece of business that is conducted.
 (b) The transaction log keeps a record of what transactions have taken place for security purposes in order to prevent fraud.

Chapter 17**Worksheet 17.1**

- 1(a) Schools
Hospitals
Stores
- (b) A person's date of birth
Medical conditions they may have
The political party they vote for
- 2(a) To understand the buying habits of their customers.
- (b) In a magnetic stripe on the back of the card.
- (c) They know what newspapers and magazines you buy, how much you spend on shopping, what alcohol you buy and so on. This information should really only be known by you.
- 3 it is easier to cross reference
alterations are not seen
there is the danger of hacking
copying large amounts of data takes less time
- 4(a) 1998 Data Protection Act
- (b) The people who are given control of the data in an organisation.
The people to which the personal data refers.
- (c) racial or ethnic origin
- (d) The Data Protection Commissioner.
- 5 Data is adequate, relevant and not excessive
Personal data should be adequate and kept up to date
Personal data should only be used for one or more lawful purposes
There must be sufficient security to cover the personal data

Chapter 18

Worksheet 18.1

- 1(a) If the network is connected to the Internet then other people in using computers in their homes may be able to hack in.
- (b) Add viruses
See confidential information and tell others about it
- (c) The Computer Misuse Act 1990
- (d) Use a combination of passwords and user names
- 2(a) When using a debit card, the money comes out of your current account immediately. With a credit card you get a monthly statement and you can choose to pay some or all, of the amount you owe.
- (b)(i) Electronic Funds Transfer at Point Of Sale
- (ii) The ability to get cash using your debit card.
- (iii) If you have a debit card you can ask for cash at the same time as buying goods at a supermarket.

Situation	Act covered (A or B?)
Distributing the music on a CD to a friend using the Internet	B
Copying a CD containing software using a CD-rewriter and then selling the copy in the local paper.	B
Hacking into your school's computer system using your home computer.	A
Distributing a virus with the deliberate intent to damage the data and programs on another person's computer.	A
Putting a copy of a piece of software on a server and then allow it to be used by many terminals when a licence for more than one user has not been obtained.	B

- 4(a) Illegally copying software and using it.
 (b) The Copyright, Designs and Patents Act 1989

- 5(a) Automated Teller Machine
 (b) The PIN number
 (c) To make sure that only the person to which the card belongs is able to use the card.

Chapter 19

Worksheet 19.1

- 1(a) The people of the world operate as one rather than as belonging to different countries.
 (b) People are more willing to share ideas.
 All countries will be able to have access to the latest technologies
- 2 Where a crime is committed using the Internet that would be illegal in one country but legal in another.
- 3(a) Software that has been copied illegally.
 (b) Copies may be placed on a site which anyone can access and download from.
 (c) Copyright laws may not exist in some countries or may not be taken as seriously as they are in others.

Worksheet 19.2

- 1 Only those people who have access to the Internet can take advantage of the 'Internet only' special offers for cheaper goods and services.
- 2(a) With some sites you need a credit card to order goods.
 (b) It is compressed and does not take long to download. If it took hours to download one track, people would not probably bother doing it.
- 3 People are encouraged by firms giving them computers and mobile phones to do more work at home. This can cause friction in relationships with partners, wives and husbands.

Worksheet 19.3

1(a) The people of the world operate as one rather than as belonging to different countries.

- (b) People are able to see what is available in other countries
Using chatrooms, people can make friends with others around the world
It is easier for businesses to sell their products in many different countries.

2(a) A typist

A shop assistant

- (b) Now needs to be able to use Office type packages
Needs to use point of sale terminals

(d) A filing clerk

- (e) Everyone who is connected to a network is able to access a centrally held pool of data.

3

	Social Problem	Tick if problem could be caused by ICT
1	Copying music files off the Internet illegally	√
2	Writing and spreading computer viruses	√
3	Car theft	
4	Widening of the gap between rich and poor countries	√
5	Terrorism	
6	Unemployment	√
7	Easier access to pornography	√
8	Fraud	
9	Underage drinking	

4

Job description	Impact of ICT is high	Impact of ICT is low
A plumber		√
An airline pilot	√	
A teacher	√	
A window cleaner		√
A filing clerk	√	
A typist	√	
An assembly line worker	√	
A gardener		√
A checkout assistant in a large supermarket	√	

5

	Description of situation	Tick if an ethical issue
1	A group of worried parents put a list of the names and addresses of sex offenders living in their area.	√
2	A problem with an embedded computer in an aircraft causes it to	

	crash.	
3	A thief breaks into a school computer room and steals all the computers.	
4	An employee uses the computer at work to send e-mails to friends who live in other countries.	√
5	The boss wants copies of all the e-mails his staff have sent (both business and private)	√
6	A software company uses a tracking mechanism to track customer uses of their products.	√
7	A disgruntled and disturbed student gets information off the Internet on how to make a bomb.	
8	A software producer goes out of business because of piracy of their software.	√
9	A group consisting of the main Internet Service Providers get together to try to control the content on the Internet.	√
10	A friend who likes programming programs a game which is then distributed free to anyone who wants it.	
11	A friend has a large collection of music MP3 files that have never been publicly released by the artist.	

Chapter 20

Worksheet 20.1

- 1(a) Data logging
 (b) Temperature, Oxygen
 (c) 24 hours
 (d) 15 minutes
 (e) Spreadsheet
- 2(a) To compensate because of the differences in speed between the computer and the sensors.
 To make sure that the computer can understand the data from the sensors.
 (b) Temperature
 For monitoring the temperature inside a greenhouse.

 Pressure
 For monitoring the pressure in a reaction vessel in a chemical factory.
- 3(a) It needs to be able to react instantly to the varying traffic flows during the day.
 (b) Keeps the journey times to a minimum
 Reduces accidents because of driver frustration
 (c) Pressure sensor set into the road
- 4(a) Temperature and humidity
 (b) Heater or fan
 (c) Where the output from the system is used to modify the input in some way. If it is too hot the heater is switched off which changes the input (i.e. the temperature).

Chapter 21

Worksheet 21.1

- 1(a) Repetitive Strain Injury
 - (b) It is caused by typing using a poorly positioned keyboard.
 - (c) Use a wrist rest.
- 2(a) Stress
Eyestrain
Backache
 - (b) Not using an adjustable chair and not using the correct posture when working.
- 3 Backache
Stress
Eye strain
Repetitive strain injury
- 4 Misreading an item
Transposing text or numbers during typing
- 5 It is cheaper as fewer staff are needed
Data does not need to be input into the receiver's system
- 6 Dealings between large supermarkets and their suppliers
Sending exam entries and receiving results between exam boards and schools

Worksheet 22.2

- 1(a) Printer
Modem
Telephone
 - (b) No use of a car to get to work means no greenhouse gasses from the car exhaust.
 - (c) Suited: A journalist
Unsuited: A window cleaner
 - (d) The following are suited:
Call-centre operator
Journalist
Writer
Help desk operator
- 3(a) Someone working from home who makes use of ICT equipment.
 - (b) Do not waste time travelling to and from home.
Can fit work around children, household tasks etc.
 - (c) There is no longer the divide between what is work and what is leisure

Increased bills (e.g. heating, lighting etc.)

- (d) Increased phone bills
Increased electricity costs
Increased heating costs
- 4 Fax: To send copies of paper documents to others.
Photocopier: To make copies of important documents such as memos that need to be distributed to others.
E-mail: To distribute documents to others.
Voicemail: To leave messages when a person is not at their desk.

Chapter 23

Worksheet 23.1

- 1(a) Rate of inflation
Rates of taxes
Public spending
 - (b) You could see what happens when taxes rise or fall.
You could see the effects of interest rate rises or falls.
 - (c) A model is the program that mimics the real situation whereas a simulation is using the model to see what happens when things in the model change.
- 2(a) An expert system is a computer system that mimics the intelligence of a human expert in a certain area of knowledge.
- (b) Diagnosing illnesses
Trying to find the best sites for finding oil or minerals
 - (c) You input the main symptoms and the system suggests further tests to make and then when the results of these are input the system comes up with a diagnosis and the best form of treatment.
- You supply information about the geology of the area and the system will suggest the probability of finding oil there.
- 3(a) A system that mimics the way a real plane behaves. They are used to train pilots.
- (b) Can train pilots new to a certain type of plane.
Can simulate emergency situations such as engine failure.

Chapter 24

Worksheet 24.1

- 1 The following should be ticked:
The quality of the cider is more easily controlled

Fewer staff are needed to produce the cider
It is cheaper to produce the cider in this way

- 2(a) Used to control the hardware such as printers, modems etc.
Used to copy files
- (b) Windows XP
- (c) Electronic Data Interchange
- (d) It is cheaper since fewer staff are needed because the administration is all done by the computer system.

Chapter 25

Worksheet 25.1

- 1(a) Using a debit card the money comes out of your bank account straight away whereas with a credit card you can just pay part of the amount if you want.
 - (b) Cashback allows the customer not only to pay for goods using their credit card but also to take some cash out of their account whilst at the point of sale terminal.
 - (c) Saves customers having to go to a cash dispenser (i.e. it is more convenient).
- 2(a) At the checkout (i.e. where the customer pays for their goods).
- (b) Laser scanner
Electronic scales
Keyboard
 - (c) Bar codes can sometimes get damaged so they might need to input the article code using the keyboard.

May need to alter a transaction in some way so the keyboard is used for this.
 - (d) Electronic funds transfer at point of sale
- 3(a) Cameras are used to capture number plate details and these can be used to match against the vehicles of suspects so that their whereabouts are known.

Cross-referencing between databases can be used to piece together the evidence.
- (b)(i) A shorter journey time to and from work.
Keeps the traffic moving so that the car uses less petrol (i.e. it will be cheaper).
 - (ii) Digital speed cameras attached to computers that search for the car owner's details make drivers slow down and prevent fatal accidents.

Chapter 26

Worksheet 26.2

- 1(a) Internet Service Provider

(b) To provide most home users with a connection to a range of on-line services and a connection to the Internet.

2(a) A site on the Internet containing information. It consists of one or more pages.

(b) A computer that is used to provide a permanent connection to the Internet.

3(a) Ordering goods and services using the Internet.

(b) It is cheaper to deal electronically as not as many staff are needed.

(c) The goods are usually cheaper.

(d)(i) Data is coded using a special program..

(ii) Jumbled up so that only the intended recipient can read the data. Prevents hacking when the data is sent along communication channels.

4

Statement	Tick if statement is true
Electronic mail is often called EDI	
To send someone an e-mail you need to know their e-mail address	√
E-mail only works if the people communicating have the same ISP	
One of the advantages in e-mail is to be able to receive junk mail	
E-mail is secure and cannot be read by anyone else	
You can attach files to an e-mail	√
E-mail can be sent/read using some mobile phones	√
The same e-mail can be sent to lots of different people using a mailing list	√

5(a) You can attach files such as long wordprocessed documents, photo images, spreadsheets etc. to an e-mail.

(b) Contains the names and e-mail addresses of all the people you need to contact regularly.

(c) A list of people who are in a certain group and who need to be sent the same e-mail.

6(a) Can chat to new friends with the same interests.

(b) Can listen to programs, music etc. that would not normally be available in this country.

(d) Can access a huge number of web pages on every subject imaginable.

Unravel the gobbledegook

You need to subscribe to a company called an ISP who will enable you to get onto the Internet. You pay a fee for this and for this you can have several e-mail addresses, space to save files, and a lot of content such as chat rooms, shopping etc. You will be provided with some software on CD that you install on your computer. This software will be used to access the Internet and also to be able to search for information on the Internet.

Worksheet 28.2

- 1(a) Monitor
Printer
Keyboard
Mouse
- (b) Operating system
Wordprocessing software
- 2 You do not need to print until everything on the page is perfect.
You can alter the font and the font size.
You can spellcheck the document automatically.
- 3(a) 1 Ability to choose a font
2 Ability to change the font size
3 To produce more than one column of text
4 Text formatting such as bold, italic etc.
5 Ability to spellcheck
6 Can import artwork (clip art, photos etc.)
7 Ability to check grammar
8 Can print preview
9 Can save in different file formats
10 Can use coloured text
- (b) Easier to organise a page using DTP software.
Enables files to be sent to a printer for printing professionally on a printing press. The files can be used without alteration so the printing would be cheaper.
- 4 Proofreading involves checking that the content makes sense and that the correct grammar has been used.
Spellchecking simply checks the spelling of each individual word.

Chapter 29

Worksheet 29.1

- 1 True
False
False
False

- 2(a) Divide
- (b) Add
- (c) Multiply
- (d) Subtract

- 3(a) Electricity
- (b) £15.00

Formula	Tick if formula correctly works out total
+B1+B2+B3+B4+B5+B6+B7	
+A2+A3+A4+A5+A6+A7	
=sum(B2:B7)	√
=sum(A2:A7)	
+B2+B3+B4+B5+B6+B7	√

- 4(a) Spreadsheet
- (b)(i) Text
- (ii) Numeric
- (iii) Text
- (c) =Sum(B2:B8)
- (d) B11, B12 and C9
- (e) Can re-use the spreadsheet with different numbers.
- (f) Will need to spend time learning how to use the spreadsheet software.

Chapter 30

Worksheet 30.1

- 1(a) Scanner
 - Digital camera
 - Colour printer
 - CD or DVD re-writer
- (b) Scanner- to scan in artwork or photographs.
- 2(a) Desk Top Publishing
- (b) Microsoft Publisher
- 3(a) Text may be put into newspaper style columns where different columns are used for different articles/stories.
- (b) Text and graphics can be placed in boxes called frames which can then be moved and positioned in a document.
- (c) Templates are frameworks for a document that lay out the page size, margins etc.
- (d) Style sheets are used to help make the text, headings and subheadings etc. consistent between the pages in multi-page document.

- 4 Can use a Wizard to guide you through creating different types of DTP produced documents.
You can use frames to move blocks of text and graphics to assess their visual impact.
- 5 A text file produced using wordprocessing software
A graphics file from a collection of clip art
A graphics file from a photograph that has been scanned in using a scanner

Worksheet 31.1

- 1 Fact find methods such as using questionnaires, interviews with staff, inspecting the documents used in the present system, observing the way that staff do their job etc.
- 2 A series of files stored in a computer which can be accessed in a variety of different ways.
- 3 Title
Surname
Forename
Street
Town
Postcode
Land phone no
Mobile phone no
Date when full licence held
No of accidents in the last three years
- 4

Title	text
Surname	text
Forename	text
Street	text
Town	text
Postcode	text
Land phone no	text
Mobile phone no	text
Date when full licence held	date
No of accidents in the last three years	numeric

Verification is to check that there are no mistakes made by the user during entry into the system. Validation is a check performed by a program to make sure that the data entered is allowable (i.e. valid).

- 5 Primary key
- 6 Range check to make sure that the number of accidents in the last three years is not above say 20 or less than 0.
Data type check to make sure that a date is entered for the data when full licence held field.

- 7 Money
Staff
- 8 Conversion of files from the old to the new system
Installation of hardware and software
Training of users

Student Activity 31.1

Term	Definition
Field	A space in a database used for inputting information
File	A collection of related data
Record	A set of related information about a thing or individual
Database	A series of files that can be accessed in a variety of ways
Validation	A check performed by the computer to ensure that only allowable data are entered
Verification	A pre-input check that data are accurate before processing
Query	A question asked of the database
Form	A screen used for entry of the data into a database
Report	A printout of the results from a database
Constraint	A factor that prevents the ideal system from being developed
Primary key	A field used to uniquely define a record
Data type	The type of data , e.g. character, numeric, date, etc.
Field type	Specification of the type of data that can be entered into a field

Student Activity 31.2

Name should be broken down into the three fields; Title, Surname, Forname. This is needed in order to be able to produce searches and mail merges using the data.

Address needs to be broken down into Street, Town and Postcode. This will make searching easier and also allow reporting students who come from different areas.

Age: Need to store date of birth instead as age would need to be updated at each birthday.

Worksheet 31.2

- 1(a) Typing in 23 instead of 32 for an age when both are acceptable ages.
- (b) A range check
- (c) For example having a range check to stop say an age of 50 or above being entered. Typing in 23 instead of 32 would pass this check.
- 2 Search means looking for certain information whereas sort means putting the data into a different order than that which it was stored originally.

- (a) £1.00 x
- (b) £3.00 √
- (c) £2.99 x
- (d) £0.00 x
- (e) 3.00 x
- (f) 3 pounds x

4 Passwords and user names protect against unauthorised access.

5(a) Surname

Initial

Street

Postcode

Telephone number

(b)(i) A primary key needs to be unique. There may be more than one employee with the same surname.

(ii) Number

(iii) Autonumber (because it is given automatically by the computer).

Chapter 32

Worksheet 32.1

1(a) The logging equipment is situated a long distance from the computer that is used to process the data.

(b) Taking weather readings out at sea.
River level readings for a flood warning system

(c) Logging period is the total time over which the readings are taken. Logging interval is the frequency with which the individual readings are taken.

2 Read temperature

If temperature is less than 20 turn heater on

If temperature is greater than 25 turn heater off

Repeat

3(a) FORWARD 40

RIGHT 90

FORWARD 20

RIGHT 90

FORWARD 20

LEFT 90

FORWARD 10

(b) FORWARD 20

RIGHT 60

FORWARD 17

RIGHT 60

FORWARD 15

Chapter 33

Worksheet 33.1

- 1 It may be a busy time (e.g. Christmas Eve)
Not all the checkouts are operational
Some shoppers have a more than normal amount of shopping
There may be queries raised by the customer (e.g. wrong prices, damaged goods etc.).
Some of the checkout assistants may be new and not as fast.
- 2 The model will only be accurate if all the variables have been taken into account. Models should always reflect reality.
- 3 Number of checkouts
Average number of items each shopper has
How many people are waiting
- 4 Shoppers will usually distribute themselves in queues of equal length (or numbers of items).
Cash only sales take less time.
The greater the number of items, the longer it takes to pay for them.
- 5 Make it more sophisticated by including more variables. Look at the system in more detail so that it reflects reality.

Chapter 34

Worksheet 34.1

- 1(a) Enlarge
Rotate
Crop
- (b) Ability to go from a two dimensional plan to a 3-D image.
Ability to scale diagrams up and down.
- 2 The walls can be constructed to scale and then pictures of the items (desks, chairs etc) can be added to the diagram. The user can change positions and can see their effects in 3D.
- 3 Ability to produce 2D and 3D designs
Ability to include items such as stools, mirrors etc. into the design from pre-produced shapes.
Ability to produce a list of materials from which the tradesmen can produce the finished bedrooms.
- 4(a) A collection of pre-drawn pictures available for importing into documents.
- (b) Loaded into the document being worked on.
- (c) On CD-ROM
- 5(a) Colour printer

Scanner

- (b) Use the scanner to scan the image and store it on disk in one of the many file formats. This file can then be altered by special software before being imported into the document.

Multiple Choice Questions

Chapter 1

- 1 C
- 2 D
- 3 B
- 4 B

Chapter 2

- 1 D
- 2 C

Chapter 3

- 1 A
- 2 B
- 3 D
- 4 A
- 5 B

Chapter 4

- 1 B
- 2 C
- 3 A
- 4 C
- 5 C

Chapter 5

- 1 D
- 2 D
- 3 C

Chapter 6

- 1 C
- 2 B
- 3 B

Chapter 7

- 1 D

- 2 B
- 3 D
- 4 B
- 5 A

Chapter 8

- 1 B
- 2 B
- 3 A
- 4 D

Chapter 9

- 1 B
- 2 C
- 3 C
- 4 C

Chapter 10

- 1 A
- 2 C

Chapter 11

- 1 C
- 2 C

Chapter 13

- 1 D
- 2 A
- 3 C
- 4 D

Chapter 14

- 1 A
- 2 A

Chapter 15

- 1 B
- 2 D
- 3 D
- 4 D
- 5 C
- 6 D
- 7 D
- 8 D
- 9 B
- 10 C

Chapter 16

- 1 B
- 2 B
- 3 A
- 4 B

Chapter 18

- 1 A
- 2 D
- 3 A
- 4 C

Chapter 19

- 1 D
- 2 B
- 3 C
- 4 A

Chapter 20

- 1 A
- 2 C
- 3 D
- 4 B
- 5 D
- 6 A

Chapter 21

- 1 D
- 2 C
- 3 A
- 4 D

Chapter 22

- 1 D
- 2 B
- 3 A
- 4 B
- 5 A

Chapter 23

- 1 A
- 2 B

Chapter 25

- 1 D
- 2 D
- 3 A
- 4 D

Chapter 26

- 1 A
- 2 A
- 3 B
- 4 D

Chapter 28

- 1 D
- 2 C
- 3 A

Chapter 29

- 1 D
- 2 B
- 3 A
- 4 C

Chapter 30

- 1 A
- 2 D
- 3 A

Chapter 31

- 1 A
- 2 A

Chapter 32

- 1 B
- 2 A
- 3 D

Chapter 33

- 1 D
- 2 A
- 3 D

Chapter 34

- 1 A
- 2 B
- 3 D
- 4 D