

CHAPTER 1: DIGITAL TECHNOLOGIES 1.41

Internally assessed
4 credits

AS 91071

Implement basic procedures to produce a specified digital information outcome

Key competencies

The *key competencies* practised in this chapter are:

- *thinking* – the student will be required to plan and format information in four Microsoft Office® software applications – Excel®, Access®, Word® and PowerPoint®
- *using language, symbols, and texts* – the student will be required to confidently use ICT (Information and Computer Technology) to organise and communicate information
- *managing self* – the student must employ self-discipline in order to complete, electronically store and integrate the Tasks within a set timeframe.

What this chapter covers

NCEA Level 1 Digital Technologies material covered in this chapter helps to meet the requirements for Achievement Standard 91071 (Digital Technologies 1.41) 'Implement basic procedures to produce a specified digital information outcome'.

- The chapter covers the skills required for inputting, formatting, manipulating and integrating data in four Microsoft Office software programs – Excel, Access, Word and PowerPoint.
- The coursework involves two projects based on two different scenarios. Each project in turn consists of five or six Tasks.

Students will be required to demonstrate the application of acceptable file management procedures as well as data integrity and testing procedures to ensure the outcome meets the specifications for AS 91071 (Digital Technologies 1.41).

It is expected that the student has prior experience in using a personal computer. It is recommended that keying-in skills are practised using a typing tutorial such as those offered free online, as expertise in touch-typing using correct finger pathways will ensure faster and more accurate input of data.

Achievement criteria

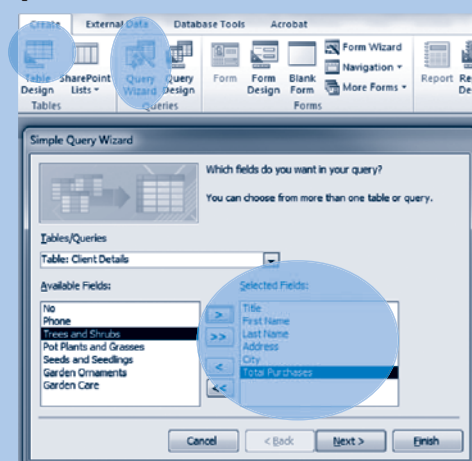
Achievement	Achievement with Merit	Achievement with Excellence
Implement basic procedures to produce a specified digital information outcome.	<i>Skilfully</i> implement basic procedures to produce a specified digital information outcome.	<i>Efficiently</i> implement basic procedures to produce a specified digital information outcome.

Achievement

'Implement basic procedures to produce a specified digital information outcome' involves:

- applying a set of techniques to produce a digital information outcome that meets specifications
- selecting the appropriate software applications and specific features to manage and present information
- applying file management procedures

Queries



Queries are collections of related data extracted from the main database table. A Query can be created using the [Create → Query Wizard](#) function. For example, if GEPS GSL management wishes to send a letter to all clients who have spent over \$1,000, they can use the [Simple Query Wizard](#) option and select only the Fields they would require for this query, i.e.:

Title
First Name
Last Name
Address
City
Total Purchases

Query 'formulas'

Field:	[Title]	[First Name]	[Last Name]	[Address]	[City]	[Total Purchases]
Table:	Client Details	Client Details	Client Details	Client Details	Client Details	Client Details
Sort:						
Show:	☒	☒	☒	☒	☒	☒
Criteria:						>1000
or:						

To extract the clients who have spent over \$1,000, the data operator can modify the query by specifying >1000 in the criteria row of the *Purchases* field. The Query must be shown in [Design View](#) to enable this modification.

Sorting data

Sorting data alphabetically

No	Title	First Name	Last Name	Address	City	Phone	Total Purch	Trees and Sh	Pot Plants a	Seeds and S	Garden Orn	Garden Care
1009	Mr	Braden	Hurle	24 Young Street	HAMILTON	857 2124	\$750	☒	☒	☒	☒	☒
1010	Mrs	Melissa	Dobbie	52 North Avenue	MATAMATA	823 6165	\$1,650	☒	☒	☒	☒	☒
1011	Dr	Chad	Belfield	12 Thames Street	HAMILTON	857 9876	\$1,875	☒	☒	☒	☒	☒
1012	Mrs	Aleisha	Cleveland	77 East Street	TE AROHA	863 1134	\$1,140	☒	☒	☒	☒	☒
1013	Mr	Sean	Hart	18 Grey Street	HAMILTON	857 3300	\$280	☒	☒	☒	☒	☒
1014	Mr	Bradley	Smith	29 Cook's Garden	HAMILTON	857 0099	\$257	☒	☒	☒	☒	☒

It is sometimes helpful to sort data alphabetically (e.g. client names, or the city/town they live in). This sorting is very simple in [Tables in Datasheet View](#). The cursor is placed anywhere in the Field and the mouse is used to select the [A-Z](#) sort option. The entire Field does not need to be highlighted.

Sorting data numerically

Field:	Title	First Name	Last Name	Address	City	Total Purchases
Table:	Client Details	Client Details	Client Details	Client Details	Client Details	Client Details
Sort:						
Show:	☒	☒	☒	☒	☒	☒
Criteria:						
or:						

It might be helpful to sort data into descending order (e.g. clients who have purchased over \$1,000 worth of products). This is accomplished by selecting the [Descending](#) option in the [Sort](#) row of the appropriate query, as shown following.

Digital photography project: Task 1

1. a. You will need three *digital photographs*. The digital photographs should have different compositions.
 - i. *Photograph 1* should be of a landscape.
 - ii. *Photograph 2* should be of a group or individual portrait – people or animal(s).
 - iii. *Photograph 3* should depict action.
- b. Use the drawing tools available (they are located from *Insert* → *Shapes* drop-down box) to create a 'Rule of Thirds' grid and circle the central rectangle as shown in the two example photographs provided under the heading *Placement* (see page 78).
2. Complete a *digital evaluation* for each photograph – this means your evaluations will be made electronically, using software (i.e. *not* on hard copy).

A digital copy of the *Photograph evaluation form* can be downloaded from ESA Online. Remember – you will need *three* copies of this form.

The first thing you must do is to *Copy* and *Paste* each photograph into the space provided on the *Photograph evaluation form* – one photograph into each form.

Photograph evaluation form

Landscape / Portrait / Action (Circle or highlight appropriate type)	
Insert resized photograph here:	
Identifying the digital media type and outcome	
Digital media:	e.g. Still image.
Is the photograph intended for personal, education, entertainment or advertising use?	
Distance or close-up?	
What digital media might the photograph appear in/on?	
Software resources	
What is the file type (JPEG, BITMAP, TIFF, GIF, PNG, PMG, WEBP, Exif)?	
What software resource was this photograph downloaded into?	
Why was this software chosen?	
Tools and techniques	
Comment on the clarity of the photograph. How might a software application enhance this photograph?	

Following are examples of script that could be added underneath Slide 3 and Slide 4.

Example script

Scene 2

Narrator: (Tone = formal, news reporter) This afternoon we are with students from Class 9TJB of Smalltown in the Waikato. They are planning to take a three-day trip to Auckland, where they will enjoy a number of activities including a ride across the harbour to Devonport, a trip to the top of the Sky Tower, movies at a Queen Street cinema complex and a day at Rainbow's End.

Students: *Cheer joyfully.*

Narrator: Before they set out, however, the students must choose suitable clothing, toiletries and entertainment. Packing the right gear will ensure maximum participation and enjoyment.

Students: *Cheer.*

Scene 3

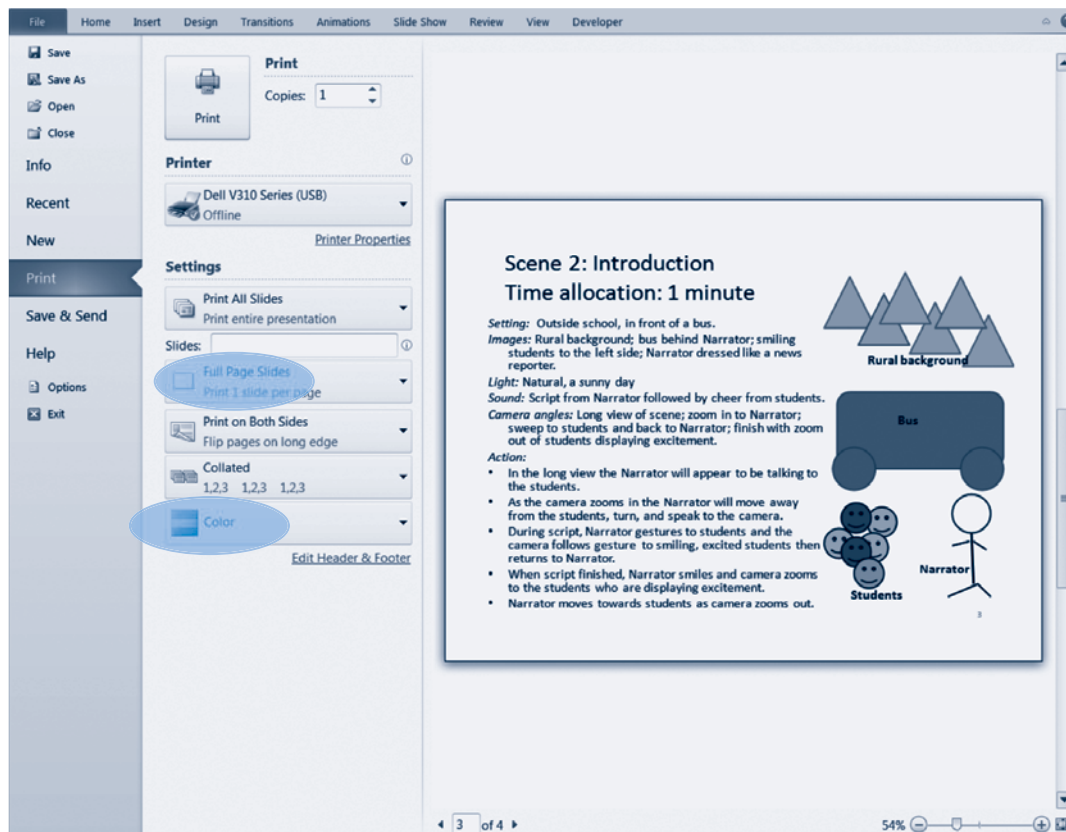
Narrator: (Tone: *hushed, ominous*) Here we are outside young Johnny Simpleton's bedroom. What is happening behind this door? Is Johnny preparing for his trip? What decisions will Johnny need to make?

(*Music plays as door is slowly opened*)

Narrator: Decision one – Which suitcase should he use?

Printing a PowerPoint storyboard

The screen capture shows the **Print** selection required to print **Notes Pages** of PowerPoint slides and script. To prevent excessive use of printer toner, select the colour as **Pure Black and White**.

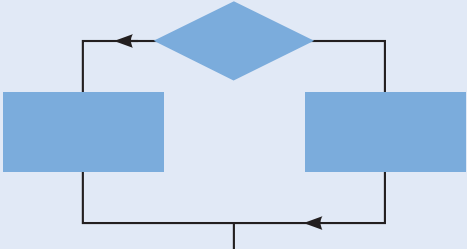
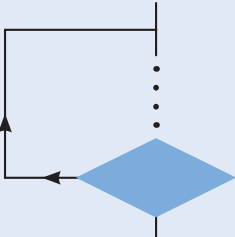


Flowcharts

The main **flowchart symbols** follow.

Symbol	Name
	Terminal
	Process
	Decision

The main flowchart constructs follow.

Sequences		
Selections	IF ... THEN ... ELSE ...	
Repetitions	REPEAT Name ... UNTIL ...	
Procedures	ENTER Name ... EXIT	

logical operators in conditional expressions	Allow you to add tests to your expressions.
relational operators	Binary codes which compare values and determine whether relationships exist.

Logical operators in conditional expressions

Logical operator	Meaning
AND	If both conditional expressions are True, then the result is True.
OR	If either conditional expression is True, then the result is True.
NOT	If the conditional expression is False, then the result is True. If the conditional expression is True, then the result is False.

Relational operators

Operator	Meaning
==	Equal to
!=	Not equal to
>	Greater than
>=	Greater than or equal to
<	Less than
<=	Less than or equal to

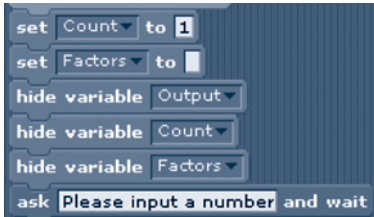
Task 6 – Factors and prime numbers

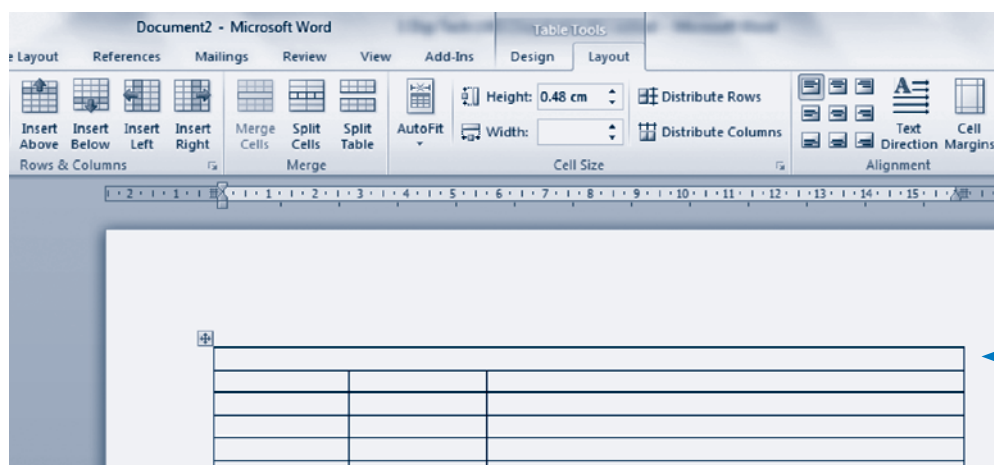
You are required to construct a game program that will inform the player (the game user) of the factors of any number keyed in between 1 and 12.

If the number input is a prime number (i.e. the only factors are 1 and itself), then the message *Prime number* is to be displayed on the screen underneath the two factors.

If the number input is over 12, a message stating *Enter a number between 1 and 12* should appear.

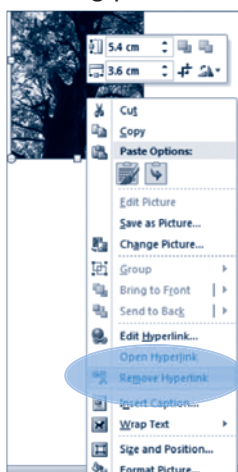
An example of code, with comments, created in *Scratch* by a Morrinsville College student, Sam Mathews, follows.

Programming software used:	Scratch
Variables	
Count:	Counter for loop
Factors:	Factors of number output
Output:	Whether the number is a prime or not
Identify a sequence:	
	



After merging the first row cells.

- Select the entire table, and, activating the *Paragraph* dialogue box, format *Before* and *After* spacing as 3 pt and *Line spacing* as *Single*. In the first column, insert an image of the component.
- Copy the component names shown in column 2 of the table.
- Use the internet to find out the purpose of each component, rewriting the information you find in your own words.
- Save the name of any website providing images or data as a *Footnote*.
- Remove any hyperlinks attached to your copied images by right-clicking on the image and clicking the *Remove Hyperlink* option as shown in the following print screen capture.

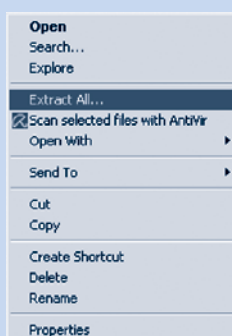


Google images is a convenient place to search for images for 'identifying the purpose of the components of a personal computer'. In *Google images*, you can opt to find only images that have a *Creative Commons license* or are in the public domain:

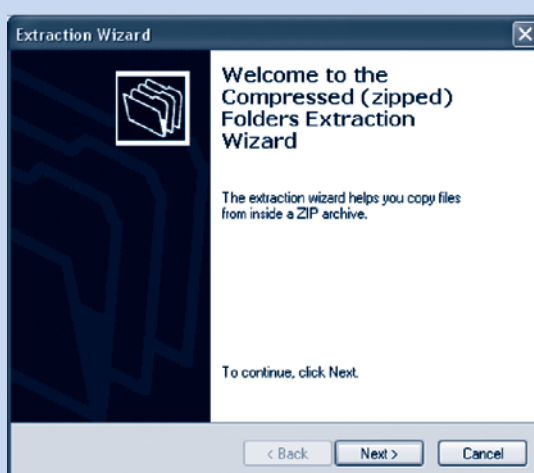
Click on the *Advanced Image Search* hyperlink, then click the radio button alongside *Only images labelled for reuse* alongside *Need more tools?* → *Usage rights*:

If you use such images, you can shorten the reference as shown in Footnote 1 at the end of the following table (see page 212).

Step 3 Select *Extract All...*



Step 4 A dialogue box opens.



Follow the *Next* prompts until you get to *Finish*.

Task 8: Practical task checklist

This Task involves displaying your file management skills. The file management skills assessed are listed in the table following. This Task will be more efficiently completed if you can work with another person. Ask your partner to observe that you can carry out each task efficiently – that is, correctly, without hesitation.

A digital copy of the *File management observation tasks* table can be downloaded from ESA Online.

File management observation tasks

Task	Tick appropriate box	
	Efficient completion	Needs more practice
Create a new Folder		
Copy and paste a Folder into another directory		
Rename the copied Folder		
Delete the copied Folder		
All Files are saved within appropriate Folders		
All Files have sensible Filenames		
Copy a File and paste it into another Folder		

Ways high-level programming language are translated into machine language

Different ways in which programs in a high-level programming language are translated into a machine language include the following.

- **Compiler** – translates high-level language directly into machine language. Because the compiler assembles the new machine program, the compiler can take longer than an interpreter. Some programming languages require an interpreter, others are able to use a compiler.
- **Interpreter** – translates high-level language into a common or intermediate form that is compatible with the machine language. Translation is immediate, therefore the interpreter is quicker than a compiler when a programmer wishes to check that a new section of code works correctly.

Functions of a compiler

Functions of a compiler include:

- translating the source code that a computer programmer writes into object code that a computer can execute
- reorganising the source code instructions into the most efficient order for the computer to execute.

Task 3: Binary code

The aim of this Task is to set cards in a row that creates the number required. This can be done individually, in pairs or in groups of three or four. Groups can compete to see how quickly they can place the cards in the correct sequence to make each number called out.

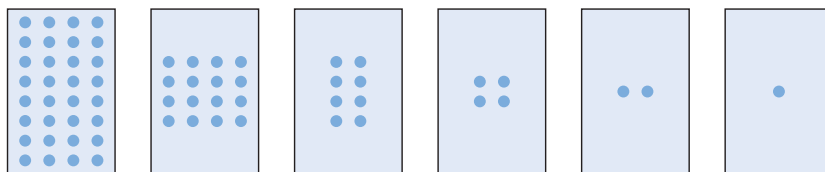
1. Using white cardboard, create a set of six cards.

Put dots on the front of each card:

- Card 1 = 32 dots
- Card 2 = 16 dots
- Card 3 = 8 dots
- Card 4 = 4 dots
- Card 5 = 2 dots
- Card 6 = 1 dot

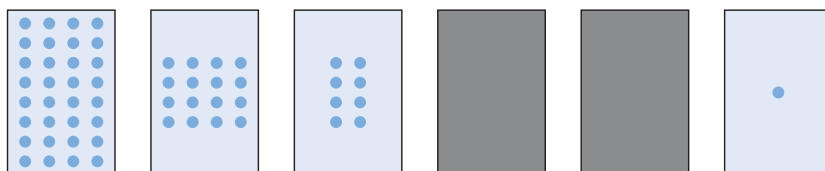
Colour the back of each card black. It represents 0.

Your cards should look similar to this:



2. Now arrange the cards to show the decimal number 57.

They should look like this:



3. Arrange the cards to make the number 31. Ask someone to check that you are correct.
4. Arrange the cards to make the following numbers: 22, 63, 49, 52, 12, 5
5. The next two numbers in the binary sequence 1, 2, 4, 8, 16, 32 are 64 and 128. If you make cards for these you will be able to show numbers between 64 and 255. You could have a competition with your friends to see who can work out the correct numbers the quickest.

Digital versions of the cards are available from ESA Online.

New Zealand bank websites project: Task 2 – Subjective considerations

A digital copy of *Subjective considerations of three New Zealand banks' websites* can be downloaded from ESA Online.

Read through your answers for *New Zealand Bank websites project: Task 1 – Home page design elements*, noting similarities and differences between the design elements used for the three New Zealand banking website Home pages analysed. Using the information you have gathered for the three bank websites, complete one copy of the table following.

Subjective considerations of three New Zealand banks' websites

Names of banks:		
Subjective considerations (aesthetic qualities)	Describe this aspect	Explain why this aspect influences the design of the web page
Fashion/Style e.g. page banner, hyperlinks and common features across all three Home pages		
Taste e.g. how the design/layout meets the approval of the type of viewer that the website hopes to attract – i.e. to conduct business rather than to entertain		
Identity e.g. the way each bank establishes and maintains its own identity		
Image/Perception e.g. how each bank establishes an image that it is user-friendly, reliable, professional		
Cultural and sociological conditions e.g. showing care for the individual and community, growth of internet banking and its importance for business success, expectation that the internet might be the first or only regular contact with clients, type of data that customers are most interested in		

INDEX

- absolute reference 52
- action scene 82
- algorithm 176, 185, 194, 253–6, 260
- algorithm cost 256
- algorithm sorting 174
- alignment 8, 73, 267, 274, 276, 288 *see also* centre alignment, justified alignment, left alignment, right alignment, vertical alignment
- animation 45–6, 75–6, 93–4, 115, 117, 138, 140, 147–53, 170, 275, 277–8
- application software 153, 191–2, 226, 235–7
- automatic timing 46
- autonumber 16
- background 43, 45, 77, 79, 99, 126, 143–4, 280, 287
- balance 21, 23, 29–30, 274, 276, 284, 292
- binary code 196, 260
- binary selection 185
- block capitals 155, 249, 267
- bold font 29
- borders 6, 31, 111, 138, 154–6, 182
- bullets 44, 73, 111–12, 156, 276
- central processing unit (CPU) 174, 192, 207, 213
- centre alignment 28, 156, 276
- centre vertical alignment 29
- chart *see* graph
- chip set 214
- colour 43, 45, 77, 79, 91, 105, 111, 117–18, 126, 130, 138, 155–6, 267, 274–9
- column graph 10–11
- column size 30
- compiler 254, 256, 260–1
- composition 77–8, 105, 118
- computer program draft plans 167, 170–2, 175, 181–3, 185, 191
- conditional expressions 195–6
- conditions (in a computer program) 167–9, 190–1, 195
- contents list 141
- copyright 31, 72–3, 77, 235–6, 244, 249
- data flow 205–6, 213–14
- data integrity and testing 1–2, 116–17
- data security 249, 251
- data storage devices 213, 248
- data type 16–18, 58, 167–8, 170–1, 185, 191
- database 3, 14–21, 58, 249, 260
- debugging 189–90, 194, 255
- decision structure controls 195
- design elements 2, 76–7, 87, 116–17, 273–9
- design theme 43
- design view 15–16, 20, 62
- desk checking 183, 187
- desktop publishing 97, 100, 117
- digital media 75–9, 115–17, 275–9
- directory 141, 237
- document planning form 5, 15, 24, 42–3, 57
- duration time (in presentations) 45
- editing (for digital media) 105–6, 109, 116–18, 260
- emotions/ideas 99
- ergonomics 273–4, 279
- ethical considerations 2, 72, 76–7, 116, 235–6, 249
- file compression 246–7
- file format 79, 245
- file management 237, 241
- filenames 242
- flowchart 170, 177, 180, 182, 227–8
- focus 79, 118
- folders 105, 109, 140, 237, 241–2, 245–6, 267
- font selection 27
- footers 7, 12, 294
- footnotes 71–2
- foreground 77
- formatting 1, 3, 7, 14, 16, 23, 25–6, 30, 45, 58, 115–16, 154–6, 179, 277–8
- forms (in database) 60–1
- formula 5–6, 14, 52–4
- frame delay 148, 153
- framing 79
- functions 5, 15, 19–20, 24, 37, 53–4, 69, 172, 190, 254, 261
- gaming and graphics software 192
- graph 5, 7, 55 *see also* column graph, pie graph
- graphic 31, 45, 109
- graphic manipulation program 116
- graphics, inserting in a word-processed document 31
- gridlines 6, 13, 31, 112