

Year 8

Computing Science

End of Term 3

Revision Guide

Student Name: _____



Hardware: any physical component of a computer system.

Input Device: a device to send instructions to be processed by the computer

Examples of Input Devices:

- Keyboard
- Mouse
- Microphone
- Web cam
- Touch screen

Output Device: a device to show the result of computer processing

Examples of Output Devices:

- Monitor
 - Printer
 - Speakers
-

Software: a set of instructions to allow a user to interact with a computer system

Algorithm: a step by step set of instructions to solve a problem

Variable: points to a value that has been stored in memory, can be changed and reused over again

Mathematical Operators

- Addition (+)
- Subtraction (-)
- Multiplication (*)
- Division (/)

Binary: a number system that uses 0's and 1's

- **1 bit** = 1 binary number (1 or 0)
 - **8 bits** = 1 byte (a standard binary number)
 - **1024 bytes** = 1 Kilobyte (KB)
 - **1024 Kilobytes** = 1 Megabyte (MB)
-

Binary Number System:

- Also known as Base₂

Denary Number System:

- Also known as Base¹⁰

Converting from Denary to Binary

The denary number 13 would be **1101** in binary.

128	64	32	16	8	4	2	1
				1	1	0	1

Converting from Binary to Denary

The binary number 101011 would be **43** in denary.

128	64	32	16	8	4	2	1
		1	0	1	0	1	1

Binary Addition

- There are 4 **rules** when adding binary numbers
- $0+0=0$
- $0+1=1$
- $1+1=10$
- $1+1+1=11$

Example	10111
	<u>01101</u>
	100100

HTML – Hyper Text Markup Language

Web Browser – Software to let a user view text, images and video online

HTTP – Hyper Text Transfer Protocol

WWW – World Wide Web

Tim Berners-Lee – creator of the www

CSS – Cascading Style Sheets (aids the formatting and layout on web pages)

HTML File type - .html

<> tags – information inside these tags tell the web browser what to display

<html> defines the start of a web page

<head> defines the head section of the web page

<a> defines a hyperlink

**
** defines a line break

<body> defines the body section (where information can be seen in the browser)

<p> defines a paragraph

<h1> to **<h6>** defines heading sizes

<title> defines what goes into the web page title section

**** numbered list

**** elements of a list

Topic 3: Collecting & Analysing Data

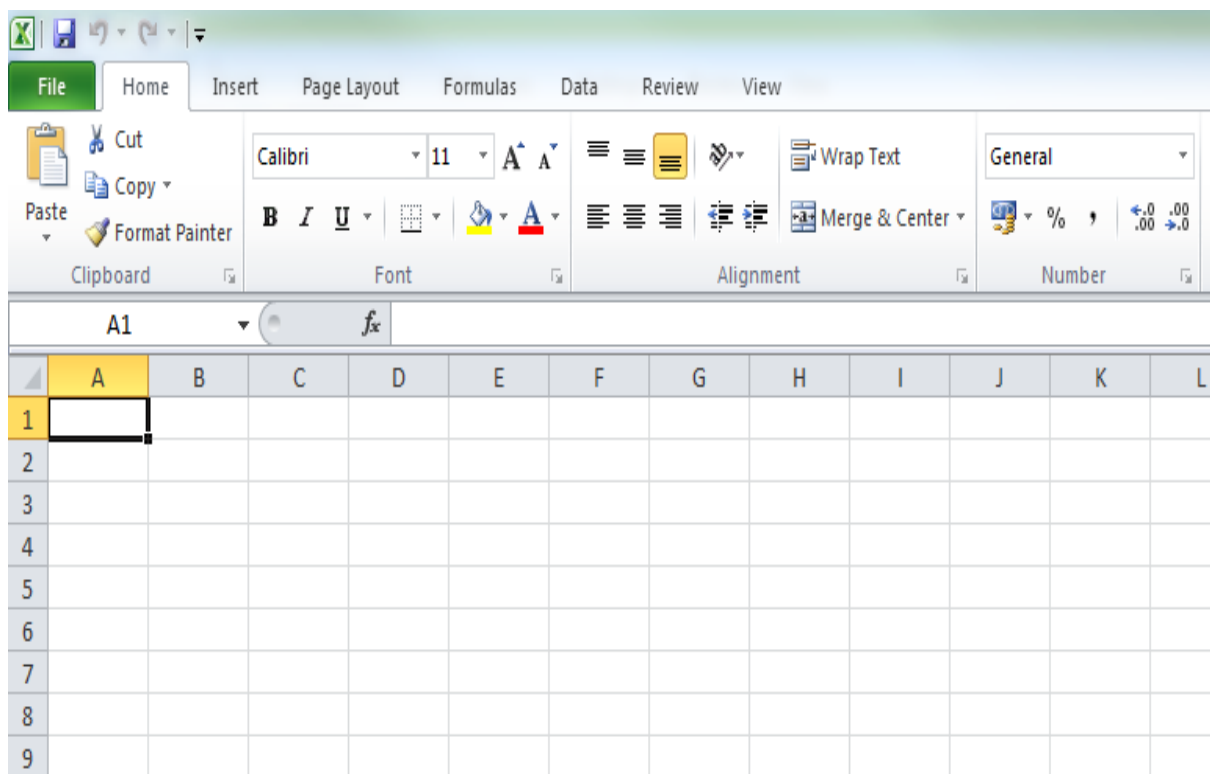
Questionnaire – the purpose of a questionnaire is to collect data.

The overall look of a questionnaire can be improved in a number of ways:

- Alignment
- Colour
- Borders
- Clear instructions

Programs that could be used for a questionnaire are MS Word or MS Publisher.

Spreadsheet – the purpose of a spreadsheet is to analyse and model data.



Rows – 1, 2, 3, 4, 5, 6, 7, 8, 9.

Columns – A, B, C, D, E, F, G, etc

A **cell** is a single box on the grid above.

A **cell reference** is the exact cell you are on: eg A1

Wrap text – ensures all text will fit into one cell.

Alignment – left, right, centre, justified

Colour can be set for **background** and **font**.

Numbers can also be formatted in the number section. Eg: set to currency

Formulas are used in spreadsheets, all formulas begin with the “=” operator.

Examples of common formulas used:

Adding cells: =A1+A2

Subtracting: =A1-A2

Multiplying: = A1*A2

Dividing: = A1/A2

Examples of common functions used:

SUM function

AVERAGE function

Charts & Graphs

These provide a graphical way to view data rather than just on a spreadsheet. A chart will always have a title, x-axis and y-axis labelled.

Topic 4: Databases

Database: a persistent store of organised data

Database Table: one table of data also known as a Flat file database

Record: a complete set of information about a person or organisation.

Field: one piece of information about a person or organisation.

Datatypes: All Fields must be given a datatype such text, number, date/time, boolean, currency.

Validation Rule: a rule designed as a check on the data being entered by the user.

Input Form: A user friendly way of entering data into a database system.

Query: A way of searching a database for particular information.

A query will normally use Boolean operators such as:

Operator	Meaning	Example
<	Less than	<1.65
<=	Less than or equal to	<=40
>	Greater than	>1.9
>=	Greater than or equal to	>=30
=	Equal to	= "M"
BETWEEN	Tests for a range of values	BETWEEN 18 AND 25
OR	At least one of the criteria must be satisfied	"medium" OR "overweight"

NOT

All criteria are satisfied
except for the ones
specified

NOT "bald"

Report: A way of outputting information usually from a query in printed form.

Topic 5: Artificial Intelligence

IDLE – Integrated Development Environment

Python is a **high level** programming language used to create software.

All python scripts must be saved with the **.py** file extension.

F5 is used to run or execute a program.

Python has a special **input** function so users can input data into a program.

```
'''The program asks user for the radius and height of the cylinder'''
r = float(input('Please enter a radius for the cylinder? '))
h = float(input('Please enter a height for the cylinder? '))
v = (3.14159 * (r**2) * h)
```

Python also has an **output** function so users can see the results of the processing that takes place. This function is called **print**.

```
print ('The volume of the cylinder is ' + str(v))
print ('The surface area of the cylinder is ' + str(round(a,2)))
```

Syntax is the rules and grammar that apply to the programming language.

A **syntax error** is when the rules of the language have not been applied correctly.

A **variable** is a name that points to a location in memory. Eg: age=10;

Here the variable is called **age** and the value **10** is stored in it.

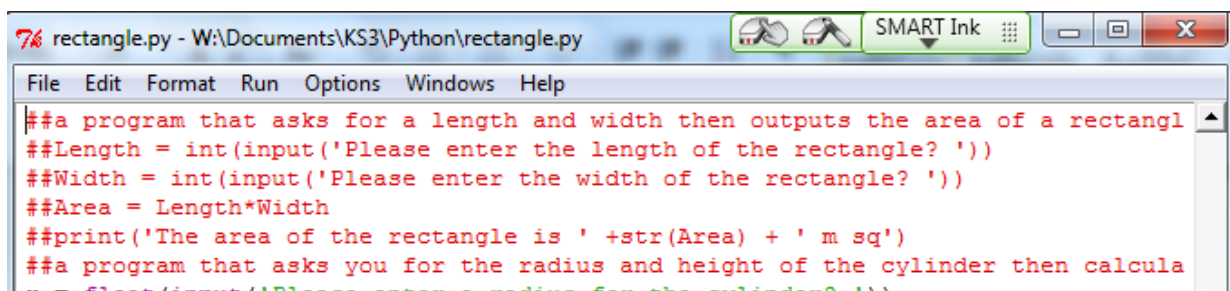
A variable must be given a **datatype**:

- 1) String – letters, words
- 2) Integer – whole numbers
- 3) Real Number – fractional numbers
- 4) Boolean – TRUE/FALSE

Mathematical operators used in programming

- Add (+)
- Subtract (-)
- Multiply (*)
- Divide (/)

Comments are used to explain sections of code.



```
76 rectangle.py - W:\Documents\KS3\Python\rectangle.py
File Edit Format Run Options Windows Help
##a program that asks for a length and width then outputs the area of a rectangl
##Length = int(input('Please enter the length of the rectangle? '))
##Width = int(input('Please enter the width of the rectangle? '))
##Area = Length*Width
##print('The area of the rectangle is ' +str(Area) + ' m sq')
##a program that asks you for the radius and height of the cylinder then calcula
r = float(input('Please enter a radius for the cylinder? '))
```

Selection is used to decide whether something is **TRUE** or **FALSE**

Eg:

```
age=18
if age > 18
    output "Adult"
else
    output "Child"
endif
```

Iteration is used to repeat sections of code.

Eg: Count controlled

```
age = 18
for i in range 1 to 10
    print(age)
next i
```

Eg: Condition Controlled

```
age = 18
```

```
i = 0
```

```
while i < 10
```

```
    print(age)
```

```
endwhile
```

```
end
```