

Student Name: 

 Tutor Grp: 

Please use the "Personal Learning Checklist" below to rate your knowledge and understanding of the AQA GCSE Computer Science 4512 course. Further information about each element of the "Subject Content" can be found at:

<http://www.aqa.org.uk/subjects/computer-science-and-it/gcse/computer-science-4512/subject-content>

In order to 'Test Yourself', please download the 2014 and 2015 examination papers and mark schemes from:

<http://www.tytheringtonschool.co.uk/parents/ks4-micro-site/ks4-micro-site-revision-guidance/computer-science-support-resources/#4512>

This same site provides links to a talk-through of the 2016 exam paper, where a Computer Science tutor talks you through how to answer every question in the paper.

Subject Content	Test Yourself on questions from...			Knowledge & Understanding Rating		
	2014 Exam Paper	2015 Exam Paper	2016 Exam Paper	Insecure	Intermediate	Secure
<b>3.1.1 Constants, variables and data types</b>	<b>3(b), 3(c), 3(d), 7(a)</b>	<b>2(a), 2(b), 7(b)</b>	<b>2(a), 2(b), 2(e), 6(a)</b>			
Understand the terms 'data' and 'information'						
Difference between a constant and a variable and when to use them						
Understand different data types available						
Purpose of data types within code						
Understand and use 1 and 2-dimensional arrays						
Be able to use NOT, AND, OR when creating Boolean expressions						
<b>3.1.2 Structures</b>		<b>2(a), 2(b)</b>	<b>1(e), 10(b)</b>			
Explain what a 'data structure' is						
Create own data structures beyond what is built in.						
Understand and explain why data structures can make coding simpler						
<b>3.1.3 Program flow control</b>	<b>3(b), 3(c), 3(d), 12(b)</b>	<b>9</b>	<b>10(c), 10(d), 10(e)</b>			
Understand the need for structure						
Understand how problems can be broken down and represented by flowcharts or structure diagrams						
Understand and describe sequencing, selection, iteration						
Know when to use different control blocks to solve a problem						

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<b>3.1.4 Procedures and functions</b>	3(a), 3(e), 7(a), 7(b)(i), 7(b)(ii), 7(b)(iii)	7(a), 7(d), 10(a)(i), 10(a)(ii), 10(b)	6(a), 6(b), 6(c), 6(d), 6(e), 6(f)			
Understand what 'procedures' and 'functions' are						
Know when using a procedure/function would make sense and simplify code						
Know how to write and use simple procedures and functions						
Be able to describe common built-in functions						
Use common built-in functions						
Understand what a 'parameter' is						
Know how to use a parameter						
Understand the concepts of parameters and return values						
<b>3.1.5 Scope of variables, constants, functions</b>	3(a), 3(e)	7(a), 7(d)				
Know what is meant by the scope of a variable, constant, function or procedure						
Be able to identify what value a particular variable will hold at a given point in the code						
<b>3.1.6 Error handling</b>	9(a)(i), 9(a)(ii), 9(a)(iii), 9(b), 9(c)	10(c)(i), 10(c)(ii)	7			
Be able to discuss and identify syntax, run-time and logical errors						
Understand that some can be detected during the coding stage						
Understand that some will occur during execution						
Know how to detect errors at execution time and how to handle them to prevent crashing.						
Be able to use trace tables to check code for errors						
Understand that programs can be developed with tools to help detect and deal with errors						
<b>3.1.7 Handling external data</b>						
Know how to use an external text file (read and write)						
Know how to use an external database (read and write)						

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<b>3.1.8 Computer structure</b>						
<b>3.1.8.1 Systems</b>		6(a)	5(a), 5(b)			
Be able to define a 'computer system'						
Understand and be able to discuss importance of computer systems in modern world						
Understand need for robustness and reliability and be able to discuss						
<b>3.1.8.2 Hardware</b>	5(a)	6(b)	1(f)(i), 1(f)(ii)			
Be able to describe and explain fundamental pieces of hardware required						
Be able to discuss developments in Technologies (including memory and processor) leading to exciting innovative products						
Be able to categorise devices as input/output						
<b>3.1.8.3 CPU (Central Processing Unit)</b>	2(a), 2(b), 2(c), 5(b), 6	6(b), 6(c)	8			
Describe purpose of the CPU						
Understand how components link to a processor (ROM, RAM, I/O, storage, etc.)						
Explain the effects of clock speed, core numbers, cache size/types on performance						
<b>3.1.8.4 Memory</b>	2(a), 2(b), 2(c), 5(b), 6	6(b), 6(d), 6(e)				
Know the difference between volatile and non-volatile memory						
Understand the purpose of both and when each should be used						
Be able to explain the purpose of virtual memory and cache memory						
Be able to explain the concept that data and instructions are stored in memory and processed by CPU						
<b>3.1.8.5 Secondary storage</b>	2(a), 2(b), 2(c), 5(b), 6	6(d)				
Understand what secondary storage is and why it is required						
Be able to describe most common types of secondary storage						
Understand how optical, magnetic and solid-state media works						

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<b>3.1.9 Algorithms</b>	7(a), 7(b), 12(a), 12(b)	3(a), 3(b)(i), 3(b)(ii), 3(b)(iii), 3(b)(iv), 7(c), 9, 10(a)(i), 10(a)(ii), 10(b)	3(b), 3(b), 10(a), 10(d), 10(e)			
Understand that algorithms are Computational solutions that always finish and return an answer						
Be able to interpret simple algorithms and deduce their function						
Be able to create algorithms to solve simple problems						
Be able to detect and correct errors in simple algorithms						
<b>3.1.10 Data representation</b>	1(a), 1(b), 1(c), 1(d), 1(e), 1(f)	1(a), 1(b), 1(c), 1(d), 1(e), 1(f)	1(a), 1(b), 1(c), 1(d), 2(a), 2(b), 2(c), 2(d)			
Understand that computers use binary to represent all data and instructions						
Understand the terms bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte						
Understand what a binary code could represent						
Understand how to represent a positive integer up to 255 in binary						
Understand how sound and bitmaps can be represented in binary						
Understand how characters are represented in binary and be familiar with ASCII						
Understand use of and conversion from/to hexadecimal						
<b>3.1.11 Software development life cycle</b>	10	4(a), 4(b)(i)				
Understand the software development life cycle						
Explain what happens at each stage						
Identify at which stage a given step would occur						
Understand that there are different models that can be used						
Be able to discuss advantages/disadvantages of these models						

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<b>3.1.11.1 Prototyping</b>	9(c)	4(b)(i), 4(b)(ii)				
Understand what prototyping is						
Discuss advantages/ disadvantages of prototyping						
Have experience of using prototyping to solve problems						
<b>3.1.12 Application testing</b>	9(c)		3(a)(i), 3(a)(ii), 5(a)			
Understand the need for rigorous testing						
Understand the different types of tests, including unit/modular testing						
Be able to create and use suitable test plans						
Be able to hand test simple algorithms using trace tables						
<b>3.1.13 Networking</b>	4(a)	8	4(a)(i), 4(a)(ii)			
Understand what a computer network is						
Discuss advantages/ disadvantages of using a network						
Describe and explain bus, ring and star topologies						
Discuss advantages/ disadvantages of these topologies						
<b>3.1.13.1 Client server</b>	4(b)		4(b)			
Understand the client-server model						
Explain in simple terms the handshake process used in most modern protocols						
Be able to explain the difference between coding for client server and standalone						
<b>3.1.13.2 Web application concepts</b>	4(b)					
Understand the concept of coding at client and server ends						
Know what can be coded at server end						
Know what can be coded at client end						
Have experience of coding simple web applications						

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<b>3.1.14 Use of external code sources</b>	11					
Know of the existence of external code sources						
Know how to integrate code from these sources into own						
Be able to explain advantages and disadvantages						
<b>3.1.15 Database concepts</b>	8(a), 8(b)	5(a)(i), 5(a)(ii), 5(a)(iii)	9(a)(i), 9(a)(ii), 9(a)(iii), 9(c)			
Understand the basic concepts of Relational database						
Be able to explain the terms record, field, table, query, primary key, relationship, index and search criteria						
<b>3.1.15.1 Query methods (SQL)</b>	8(b)(i), 8(b)(ii)	5(b), 5(c)	9(b)			
Be able to create simple SQL statements to extract, add and edit data						
Have experience of using SQL in your own solutions						
<b>3.1.15.2 Connecting to databases from applications and web based apps</b>						
Be able to use databases from within their own web based applications						
<b>3.1.16 The use of computer technology in society</b>						
Be able to evaluate the effectiveness of computer programs/solutions						
Be able to evaluate the impact and issues related to the use of computer technology in society						