

# The Sixth Form at George Abbot

'Academic excellence within a vibrant community.'

Subject: Computer Science

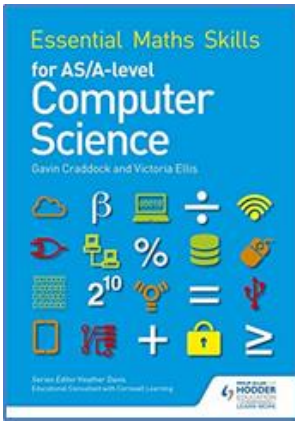
Head of Department: Mr Hunter [jhunter@georgeabbot.surrey.sch.uk](mailto:jhunter@georgeabbot.surrey.sch.uk)

## Pre Sixth Form Tasks

Task	Detail	Demonstrated		
		Yes	Partially	No
Organisation	<p>Prepare the following for storing lesson notes:</p> <ul style="list-style-type: none"> <li>• Large Ring-binder</li> <li>• Dividers</li> <li>• Plastic wallets</li> <li>• Multi-coloured pens</li> <li>• Highlighters</li> <li>• Ruler</li> </ul> <p>Complete the tasks below.</p>			
Further Reading	<p><b>Books</b></p> <p><i>Trigger Happy: The inner life of videogames</i> - Stephen Poole. A witty, comprehensive and passionate discourse on the videogame explosion. Essential reading for anyone with an interest in this industry.</p> <p><i>Accidental Empires – Robert X Cringely.</i> An insider's account of the origins and growth of the micro-computing industry from the earliest times to the present day; acerbic and funny in equal measure.</p> <p><b>Magazines:</b> Wired New Scientist</p> <p><b>Websites:</b> <a href="http://www.tnmoc.org/">http://www.tnmoc.org/</a> <a href="http://pcpro.com">http://pcpro.com</a> <a href="http://www.theregister.co.uk/">http://www.theregister.co.uk/</a></p>			
Additional task(s)	<p>Complete the 'Computer Science – Skeleton Code Task' activity.</p> <p>Print out the questions below and answer them on the sheet.</p> <p>Bring the work to the first lesson.</p>			

## Suggested Reading List and Subject Resource

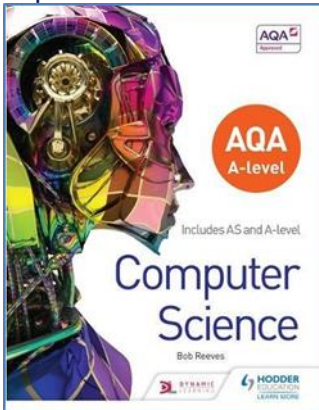
Essential Maths Skills for AS/A-Level Computer Science



Either of the following textbooks are beneficial to the course:

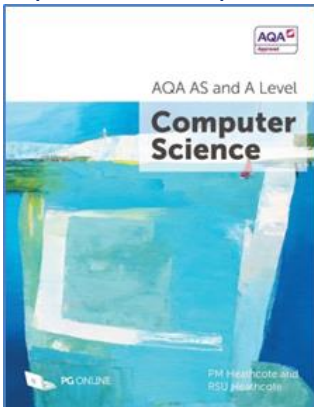
AQA A level Computer Science

Paperback – 26 June 2015



AQA AS and A Level Computer Science

Paperback – 24 Apr 2016



All tasks completed	Yes	No
Subject Teacher Signature		

## Pre-Course Knowledge Recap and Coding Tasks

### **INSTRUCTIONS:**

**Answer the questions in sections 1-4, which will test your understanding and consolidate your knowledge of key areas.**

**Use the space provided to write your answers to each question.**

**For the programming task, take screenshots of both the program code and also the tests you carry out.**

# 1. Iteration

Program A		Program B	
01	INPUT Num	01	Password = "none"
02	FOR i = 1 to Num	02	WHILE Password != "turing" INPUT
03	OUTPUT i	03	Password
04	NEXT i	04	END WHILE
		05	OUTPUT "Password Correct"

1. Which one of the two programs shown above features an example of a condition-controlled loop? (1)

2. Give the line number of the condition from the program you identified in your answer to the previous question. (1)

3. Which one of the two programs shown above features an example of a count-controlled loop? (1)

4. Describe the purpose of Program A. (3)

5. Describe the purpose of Program B. (3)

6. Explain the difference between REPEAT UNTIL and WHILE loops. (3)

7. Rewrite Program A using a WHILE loop. (3)

## 2. Subroutines

Program A		Program B		Program C	
01	_____areaCalc(W, H)	01	_____average(A, B, C)	01	_____compare(A, B)
02	Area = W * H	02	Total = A + B + C	02	IF A > B THEN
03	OUTPUT Area	03	Average = Total / 3	03	OUTPUT A
04	END _____	04	RETURN Average	04	ELSE
05	areaCalc(10, 8)	05	END _____	05	OUTPUT B
		06	average(4, 3, 4)	06	END _____
				07	compare(6, 4)

1. **Identify a program that contains a function from the three shown above. (1)**

2. **Identify the parameters that are defined in Program B. (3)**

3. **Identify the arguments that are passed to the areaCalc subroutine in Program A. (2)**

4. **Identify the arguments that are passed to the compare subroutine in Program C. (2)**

5. **What would be the output of the areaCalc subroutine based on the call in Program**

**A? (1)**

6. **What would be the output of the compare subroutine based on the call in Program**

**C? (1)**

7. **Describe the difference between a procedure and a function. (2)**

### 3. Binary and Hexadecimal

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1. Convert the decimal number 45 into binary. (2)

128	64	32	16	8	4	2	1

2. Convert the binary number 01100101 into decimal. (2)

3. Convert the decimal number 165 into hexadecimal. (2)

4. Convert the hexadecimal number B6 into decimal. (2)

5. Convert the hexadecimal number 9B into binary. (2)

6. Convert the binary number 10010010 into hexadecimal. (1)

## 4. Arrays

Use the names array shown below to help you to answer the following questions:

Index	0	1	2	3	4	5	6
Value	Susan	Ian	Barbara	Steven	Ben	Polly	Sarah

1. State the value of names[3]. (1)

2. State the value of names[1]. (1)

3. How can the value 'Ben' be accessed in the names array? (1)

4. How can the value 'Sarah' be accessed in the names array? (1)

5. Create the names array using pseudocode. (2)

6. Write a FOR loop that will cycle through the names array, outputting each name in turn. (3)

Use the scores array shown below to help you to answer the following questions:

	0	1	2	3
0	45	71	34	55
1	23	82	57	37
2	18	31	53	57
3	32	58	97	43

7. State the value of scores[3][1]. (1)

8. State the value of scores[1][2]. (1)

9. How can the value 71 be accessed in the scores array? (1)

10. How can the value 97 be accessed in the scores array? (1)

11. Create the scores array using pseudocode. (3)



## Python Programming Task:

The algorithm, represented using pseudo-code below, outputs a series of integers or the message `No result`. The output depends upon the value entered by the user.

```
OUTPUT "Enter an integer greater than 1: "  
INPUT X  
  
Product ← 1  
  
Factor ← 0  
WHILE Product < X  
    Factor ← Factor + 1  
  
    Product ← Product * Factor  
ENDWHILE  
IF X = Product THEN  
    Product ← 1  
  
    FOR N ← 1 TO Factor  
        Product ← Product * N  
        OUTPUT N  
    ENDFOR  
ELSE  
    OUTPUT "No result"  
ENDIF
```

### What you need to do:

#### Task 1

Write a program to implement the algorithm.

#### Task 2

Test that your program works:

- run your program, then enter the number `720`
- run your program, then enter the number `600`

### Evidence that you need to provide

- (a) Your PROGRAM SOURCE CODE for **Task 1**. (9)
- (b) SCREEN CAPTURE(S) showing the tests described in **Task 2**. (1)
- (c) What is true for all valid inputs for `x` that output a number of numbers which is not true for all other valid inputs that output `No result`? (1)

**(Total 11 marks)**