

Unit 2.1 – Algorithms

MCQS

The numbers after the question are an approximate estimation of relative difficulty, broadly based around the new GCSE Numbering System. Please note that these were produced before final guidance was released regarding levels of difficulty and as such should be used as a rough guide only.

Lessons 1,2

Question 1: Identify the search algorithm (1-2)	✓
Random search	
Binary search	
Denary search	
Next Item search	
Question 2: Identify the description of a linear search (4-5)	✓
Put the elements in order, check each item in turn	
Put the elements in order, compare to the middle value, split the list in order and repeat	
Elements do not need to be in order, check each item in turn	
Elements do not need to be in order, compare to the middle value, split the list in order and repeat	
Question 3: Identify the description of a binary search (4-5)	✓
Put the elements in order, check each item in turn	
Put the elements in order, compare to the middle value, split the list in order and repeat	
Elements do not need to be in order, check each item in turn	
Elements do not need to be in order, compare to the middle value, split the list in order and repeat	
Question 4: Define the term computational thinking (1-2)	✓
Using a computer	
Developing an algorithm to solve a problem	
Making a computer use artificial intelligence	
Google is computational thinking	
Question 5: Which of the following is not a component of computational thinking? (1-2)	✓
Abstraction	
Typing	
Decomposition	
Algorithmic thinking	
Question 6: Define the term abstraction within computational thinking (4-5)	✓
Adding together numbers	
Taking a real world problem and designing a computer program that exactly replicates every part of that problem in the computer	
Performing multiple calculations on a list of variables	
Representing real world problems in a computer program, using symbols and removing unnecessary elements	

Question 7: Define the term decomposition within computational thinking (1-2)		✓							
The breaking down of a program until it no longer exists									
The creation of music that can be played on a computer									
The breaking down of a problem into smaller problems									
The breaking down of waste to make compost									
Question 8: Identify which statement describes algorithmic thinking (1-2)		✓							
Thinking like a computer									
Writing binary numbers									
Identifying the steps involved in solving a problem									
Identifying what problems need to be solved									
Question 9: A linear search is to be performed on the list:		✓							
<table><tr><td>12</td><td>6</td><td>8</td><td>1</td><td>3</td></tr></table>			12	6	8	1	3		
12	6	8	1	3					
How many comparisons would it take to find the number 1? (6-9)									
1									
2									
3									
4									
Question 10: A binary search is to be performed on the list:		✓							
<table><tr><td>3</td><td>5</td><td>9</td><td>10</td><td>23</td></tr></table>			3	5	9	10	23		
3	5	9	10	23					
How many comparisons would it take to find the number 9? (4-5)									
0-1									
2-3									
4-5									
It can't find the number 9									
Question 11: A binary search is to be performed on the list:		✓							
<table><tr><td>1</td><td>5</td><td>10</td><td>13</td><td>48</td><td>68</td><td>100</td><td>101</td></tr></table>			1	5	10	13	48	68	100
1	5	10	13	48	68	100	101		
How many comparisons would it take to find the number 101? (4-5)									
0-1									
1-2									
3-4									
4-5									
Question 12: Identify the search performed by the following algorithm: (9)		✓							
for x = 0 to 9									
if (array[x]==10) then									
print("Found it")									
endif									
next x									
Linear									
Binary									
Both linear and binary									
Neither, it does not work									

MCQS

Lessons 3, 4 and 5

Question 1: Which of the following is not a sorting algorithm? (1-2)		✓				
Bubble						
Insertion						
Binary						
Merge						
Question 2: Which sorting algorithm is described by: moving through a list repeatedly, swapping elements that are in the wrong order. (1-2)		✓				
Merge						
Bubble						
Insertion						
None of the above						
Question 3: Which sorting algorithm is described by: split a list into individual lists, then combine these, two lists at a time. (1-2)		✓				
Merge						
Bubble						
Insertion						
None of the above						
Question 4: Which sorting algorithm is described by: take each item in turn, compare it to the items in the sorted list and place it in the ordered position in the sorted list. (1-2)		✓				
Merge						
Bubble						
Insertion						
None of the above						
Question 5: What is the first action in an insertion sort? (4-5)		✓				
Make a new list						
Mark the first item as the ordered list						
Compare the first and second elements						
Put the first element in the correct place						
Question 6: The following two lists are to be merged, which element first goes into the new merged list (4-5)						
List 1:						
<table><tr><td>2</td><td>4</td><td>8</td><td>9</td></tr></table>		2	4	8	9	✓
2	4	8	9			
List 2:						
<table><tr><td>1</td><td>6</td><td>8</td><td>4</td></tr></table>		1	6	8	4	
1	6	8	4			
0						
1						
2						
3						

Question 7: The following list is to be sorted using a bubble sort:

12	6	8	1	3
----	---	---	---	---

✓

What will the list look like after the first iteration through the list. (9)

6	8	1	3	12
---	---	---	---	----

6	12	1	8	3
---	----	---	---	---

1	3	6	8	12
---	---	---	---	----

6	8	1	12	3
---	---	---	----	---

Question 8: Which sorting algorithm needs to go through the list repeatedly? (4-5)

✓

Merge

Bubble

Insertion

None of them do

Question 9: Which sorting algorithm splits a list of items into individual lists. (1-2)

✓

Merge

Bubble

Insertion

None of them do

Question 10: Which sorting algorithm takes an item from the list, and puts it in the correct place in a sorted list? (4-5)

✓

Merge

Bubble

Insertion

None of them do

MCQS

Lessons 6 and 7

Question 1: Identify the correct definition for 'algorithm'. (1-2)

✓

A problem

A solution to a problem

The steps that are taken to solve a problem

The words to enter when typing

Question 2: Identify the purpose of the following flowchart symbol: (1-2)



✓

Input/Output

Output

Start/Stop

Decision

Question 3: Identify the purpose of the following flowchart symbol: (1-2)



✓

Input/Output

Sub-process

Process

Decision

Question 4: Define the term computational thinking (1-2)



✓

Input/Output

Sub-process

Process

Decision

Question 5: Which of the following is not a component of computational thinking? (1-2)



✓

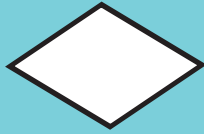
Process

Input/Output

Sub-process

Decision

Question 6: Identify the purpose of the following flowchart symbol: (1-2)



✓

Process	
Input/Output	
Sub-process	
Decision	

Question 7: How many arrows should come out of a decision symbol in a flowchart? (1-2)

✓

0

1

2

3

Question 8: The following algorithm should take as input and add together two numbers, outputting the result.

✓

Identify the correct algorithm. (4-5)

num1 = input("Enter the first number") num2 = input("Enter the second number") num3 = num1 + num2 print(num3)	
num1 = input("Enter the first number") num2 = input("Enter the second number") num3 = num1 + num2 print(num3)	
num1 = input("Enter the first number") num3 = input("Enter the second number") num3 = num1 + num2 print(num3)	
num1 = input("Enter the first number") num2 = input("Enter the second number") num3 = num1 + num2 print(num2)	

Question 9: The following algorithm should take as input on number, and output the 12 times table for that number.

✓

Identify the correct algorithm. (9)

```
number = input("Enter a number")
for x = 1 to 12
    print(number * x)
next x
```

```
number = input("Enter a number")
for x = 0 to 12
    print(number * x)
next x
```

```
number = input("Enter a number")
for x = 1 to 12
    print(number X x)
next x
```

```
number = input("Enter a number")
for x = 1 to 12
    print(number * number)
next x
```

Question 10: The following algorithm should take as input two numbers, add them together, multiply the answer by 11, add 4, then divide by 2. It should output the result.

✓

Identify the correct algorithm. (9)

```
number = input("Enter a number")
number = input("Enter the second number")
final = (((number + number) * 11) + 4) / 2
print (final)
```

```
number = input("Enter a number")
number2 = input("Enter the second number")
final = (((number + number2) * 11) + 4) * 2
print (final)
```

```
number = input("Enter a number")
number2 = input("Enter the second number")
final = number + number2 + 4 * 11 / 2
print (final)
```

```
number = input("Enter a number")
number2 = input("Enter the second number")
final = (((number + number2) * 11) + 4) / 2
print (final)
```

MCQS ANSWERS

Lessons 1,2

Question 1: Identify the search algorithm (1-2)	✓
Random search	
Binary search	✓
Denary search	
Next Item search	
Question 2: Identify the description of a linear search (4-5)	✓
Put the elements in order, check each item in turn	
Put the elements in order, compare to the middle value, split the list in order and repeat	
Elements do not need to be in order, check each item in turn	✓
Elements do not need to be in order, compare to the middle value, split the list in order and repeat	
Question 3: Identify the description of a binary search (4-5)	✓
Put the elements in order, check each item in turn	
Put the elements in order, compare to the middle value, split the list in order and repeat	✓
Elements do not need to be in order, check each item in turn	
Elements do not need to be in order, compare to the middle value, split the list in order and repeat	
Question 4: Define the term computational thinking (1-2)	✓
Using a computer	
Developing an algorithm to solve a problem	✓
Making a computer use artificial intelligence	
Google is computational thinking	
Question 5: Which of the following is not a component of computational thinking? (1-2)	✓
Abstraction	
Typing	✓
Decomposition	
Algorithmic thinking	
Question 6: Define the term abstraction within computational thinking (4-5)	✓
Adding together numbers	
Taking a real world problem and designing a computer program that exactly replicates every part of that problem in the computer	
Performing multiple calculations on a list of variables	
Representing real world problems in a computer program, using symbols and removing unnecessary elements	✓
Question 7: Define the term decomposition within computational thinking (1-2)	✓
The breaking down of a program until it no longer exists	
The creation of music that can be played on a computer	
The breaking down of a problem into smaller problems	✓
The breaking down of waste to make compost	

Question 8: Identify which statement describes algorithmic thinking (1-2)		✓
Thinking like a computer		
Writing binary numbers		
Identifying the steps involved in solving a problem		✓
Identifying what problems need to be solved		
Question 9: A linear search is to be performed on the list:		
12 6 8 1 3		✓
How many comparisons would it take to find the number 1? (6-9)		
1		
2		
3		
4		✓
Question 10: A binary search is to be performed on the list:		
3 5 9 10 23		✓
How many comparisons would it take to find the number 9? (4-5)		
0-1		✓
2-3		
4-5		
It can't find the number 9		
Question 11: A binary search is to be performed on the list:		
1 5 10 13 48 68 100 101		✓
How many comparisons would it take to find the number 101? (4-5)		
0-1		
1-2		
3-4		✓
4-5		
Question 12: Identify the search performed by the following algorithm: (9)		
for x = 0 to 9 if (array[x]==10) then print("Found it") endif next x		
Linear		✓
Binary		
Both linear and binary		
Neither, it does not work		

MCQS ANSWERS

Lessons 3, 4 and 5

Question 1: Which of the following is not a sorting algorithm? (1-2)		✓				
Bubble						
Insertion						
Binary		✓				
Merge						
Question 2: Which sorting algorithm is described by: moving through a list repeatedly, swapping elements that are in the wrong order. (1-2)		✓				
Merge						
Bubble		✓				
Insertion						
None of the above						
Question 3: Which sorting algorithm is described by: split a list into individual lists, then combine these, two lists at a time. (1-2)		✓				
Merge		✓				
Bubble						
Insertion						
None of the above						
Question 4: Which sorting algorithm is described by: take each item in turn, compare it to the items in the sorted list and place it in the ordered position in the sorted list. (1-2)		✓				
Merge						
Bubble						
Insertion		✓				
None of the above						
Question 5: What is the first action in an insertion sort? (4-5)		✓				
Make a new list						
Mark the first item as the ordered list		✓				
Compare the first and second elements						
Put the first element in the correct place						
Question 6: The following two lists are to be merged, which element first goes into the new merged list (4-5)						
List 1:						
<table><tr><td>2</td><td>4</td><td>8</td><td>9</td></tr></table>		2	4	8	9	✓
2	4	8	9			
List 2:						
<table><tr><td>1</td><td>6</td><td>8</td><td>4</td></tr></table>		1	6	8	4	
1	6	8	4			
0						
1		✓				
2						
3						

Question 7: The following list is to be sorted using a bubble sort:

12	6	8	1	3
----	---	---	---	---

✓

What will the list look like after the first iteration through the list. (9)

6	8	1	3	12
---	---	---	---	----

✓

6	12	1	8	3
---	----	---	---	---

1	3	6	8	12
---	---	---	---	----

6	8	1	12	3
---	---	---	----	---

Question 8: Which sorting algorithm needs to go through the list repeatedly? (4-5)

✓

Merge

Bubble

✓

Insertion

None of them do

Question 9: Which sorting algorithm splits a list of items into individual lists. (1-2)

✓

Merge

✓

Bubble

Insertion

None of them do

Question 10: Which sorting algorithm takes an item from the list, and puts it in the correct place in a sorted list? (4-5)

✓

Merge

Bubble





Insertion

✓

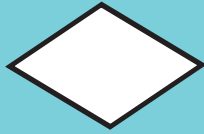
None of them do

MCQS ANSWERS

Lessons 6 and 7

Question 1: Identify the correct definition for 'algorithm'. (1-2)		✓
A problem		
A solution to a problem		
The steps that are taken to solve a problem		✓
The words to enter when typing		
Question 2: Identify the purpose of the following flowchart symbol: (1-2)		
		✓
Input/Output		
Output		
Start/Stop		✓
Decision		
Question 3: Identify the purpose of the following flowchart symbol: (1-2)		
		✓
Input/Output		✓
Sub-process		
Process		
Decision		
Question 4: Define the term computational thinking (1-2)		
		✓
Input/Output		
Sub-process		✓
Process		
Decision		
Question 5: Which of the following is not a component of computational thinking? (1-2)		
		✓
Process		✓
Input/Output		
Sub-process		
Decision		

Question 6: Identify the purpose of the following flowchart symbol: (1-2)



✓

Process	
Input/Output	
Sub-process	
Decision	✓

Question 7: How many arrows should come out of a decision symbol in a flowchart? (1-2)

✓

0

1

2

✓

3

Question 8: The following algorithm should take as input and add together two numbers, outputting the result.

✓

Identify the correct algorithm. (4-5)

```
num1 = input("Enter the first number")
num2 = input("Enter the second number")
num3 = num1 + num2
print(num3)
```

```
num1 = input("Enter the first number")
num2 = input("Enter the second number")
num3 = num1 + num2
print(num3)
```

✓

```
num1 = input("Enter the first number")
num3 = input("Enter the second number")
num3 = num1 + num2
print(num3)
```

```
num1 = input("Enter the first number")
num2 = input("Enter the second number")
num3 = num1 + num2
print(num2)
```

COMPUTER SCIENCE

MCQs and Answers

Question 9: The following algorithm should take as input on number, and output the 12 times table for that number.

✓

Identify the correct algorithm. (9)

```
number = input("Enter a number")
for x = 1 to 12
  print(number * x)
next x
```

✓

```
number = input("Enter a number")
for x = 0 to 12
  print(number * x)
next x
```

```
number = input("Enter a number")
for x = 1 to 12
  print(number X x)
next x
```

```
number = input("Enter a number")
for x = 1 to 12
  print(number * number)
next x
```

Question 10: The following algorithm should take as input two numbers, add them together, multiply the answer by 11, add 4, then divide by 2. It should output the result.

✓

Identify the correct algorithm. (9)

```
number = input("Enter a number")
number = input("Enter the second number")
final = (((number + number) * 11) + 4) / 2
print (final)
```

```
number = input("Enter a number")
number2 = input("Enter the second number")
final = (((number + number2) * 11) + 4) * 2
print (final)
```

```
number = input("Enter a number")
number2 = input("Enter the second number")
final = number + number2 + 4 * 11 / 2
print (final)
```

```
number = input("Enter a number")
number2 = input("Enter the second number")
final = (((number + number2) * 11) + 4) / 2
print (final)
```

✓

We'd like to know your view on the resources we produce. By clicking on '[Like](#)' or '[Dislike](#)' you can help us to ensure that our resources work for you. When the email template pops up please add additional comments if you wish and then just click 'Send'. Thank you.

If you do not currently offer this OCR qualification but would like to do so, please complete the Expression of Interest Form which can be found here: www.ocr.org.uk/expression-of-interest

OCR Resources: the small print

OCR's resources are provided to support the teaching of OCR specifications, but in no way constitute an endorsed teaching method that is required by the Board and the decision to use them lies with the individual teacher. Whilst every effort is made to ensure the accuracy of the content, OCR cannot be held responsible for any errors or omissions within these resources. We update our resources on a regular basis, so please check the OCR website to ensure you have the most up to date version.

© OCR 2016 - This resource may be freely copied and distributed, as long as the OCR logo and this message remain intact and OCR is acknowledged as the originator of this work.

OCR acknowledges the use of the following content: n/a

Please get in touch if you want to discuss the accessibility of resources we offer to support delivery of our qualifications: resources.feedback@ocr.org.uk