OCR GCSE (9-1)
Computer Science

Component 2:

Computational thinking, algorithms & programming

Retrieval Practice Revision Booklet

How to get the most out of this booklet

This booklet contains a range of different retrieval practice activities for each Component 2 topic. To get the most out of the activities, you should complete the activities at least several weeks after you have finished the learning the corresponding topic. You may decide to do this in your own time, or your teacher may ask you to complete them as a starter or as homework.

The aim of each activity is to give you an opportunity to identify what you can easily remember without using notes, a course book, or the Internet. By doing this, you are solidifying facts in your long term memory and identifying what you need to spend more time revising.

Once you have completed as much of an activity as you can, your teacher may go through the answers, or you can check the answers using your notes, course book or the Internet. For any parts of the activity you answered incorrectly or left blank, make use of flash cards to test yourself further. These activities should not be treated as a test - they are simply a tool to make your revision smarter.

Why do I need to do the activities several weeks after I have finished the topic?

Over time, you remember fewer details about the topics you have learnt: some details get committed to long term memory and some details fade away. If you were to complete an activity on the same day as or close to finishing a topic, you would complete each one successfully and with ample detail. By waiting and completing the activities later, it highlights what you have committed to long term memory and what you may need to review again.

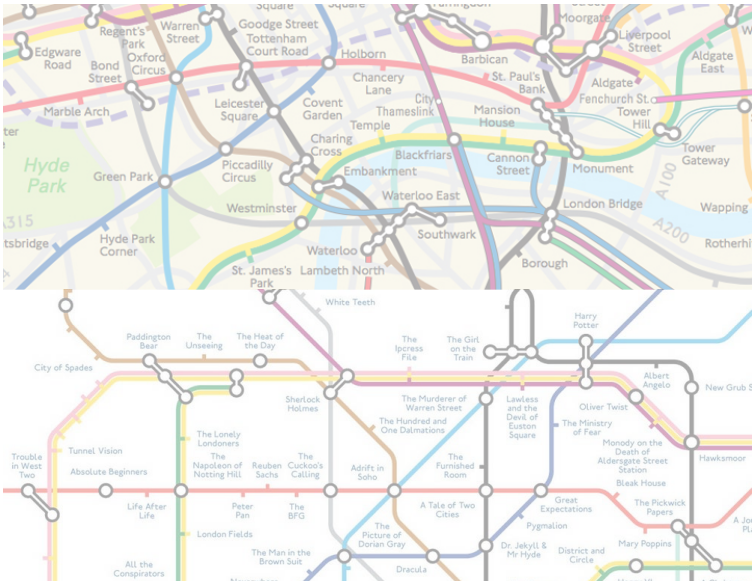
Should I highlight or re-read these activities at a later date?

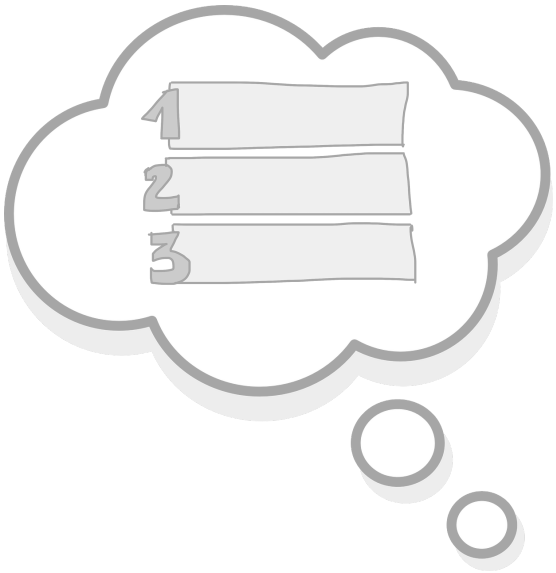
Research suggests that using highlighters and re-reading past notes and activities is not as effective as retrieval practice.

Activities

Computational Thinking: Picture Prompt

There are three branches of computational thinking. Use the picture prompts to help you identify all three. For each one, explain what it is and give an example of how they can be used in real life. Write your answers on top of the corresponding picture





Date completed: _____

How do you feel about this topic?

😀 ☐ 😐 ☐ 😕 ☐

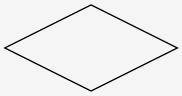
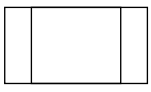
Reflection: What did you do well? What do you need to revise?

Pseudocode & Flowcharts: Brain Dump

Write as much as you can about pseudocode and flowcharts in the boxes below. This activity is to help you identify what you can remember about the topic.

What is the purpose of Pseudocode?

What is the purpose of a Flowchart?

Symbol	What does it represent?
	
	
	
	
	

Draw a simple flowchart to show how someone might decide to take an umbrella out with them.

Date completed: _____

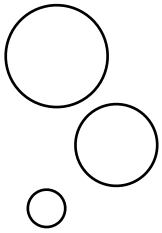
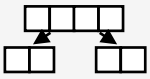
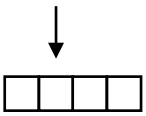
How do you feel about this topic?

Reflection: What did you do well? What do you need to revise?

Sorting algorithms: Lists

List the different steps the following sorting algorithms use to organise data.

Algorithm	Steps
	
	
	

Date completed: _____

How do you feel about this topic?

😀 ☐ 😐 ☐ 🙁 ☐

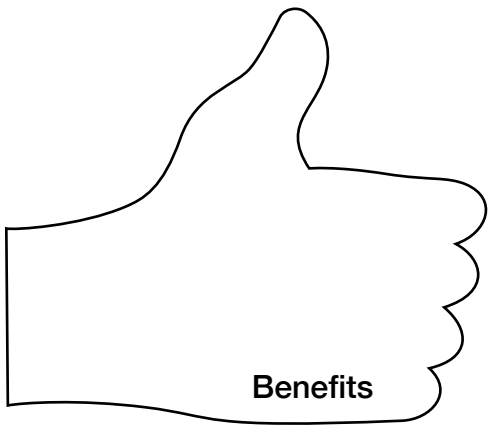
Reflection: What did you do well? What do you need to revise?

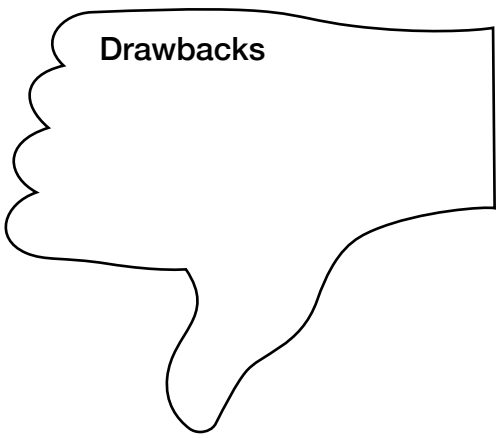
Search Algorithms: Brain Dump

Write as much as you can about the process of carrying out a binary and linear search, then outline the benefits and drawbacks of each. This activity is to help you identify what you can remember about the topic.

Binary Search

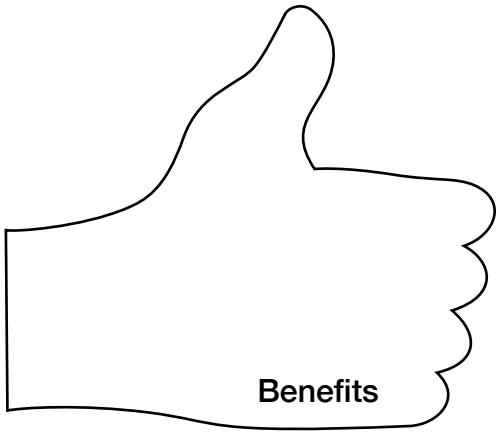
Steps

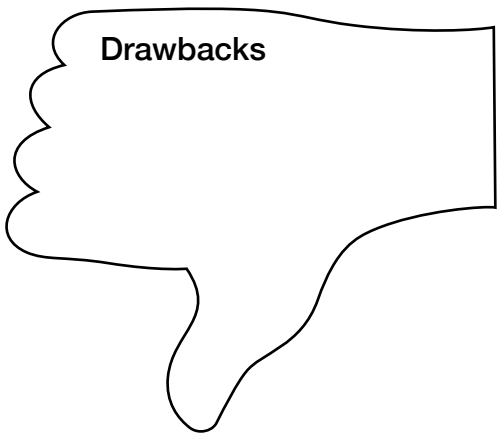




Linear Search

Steps





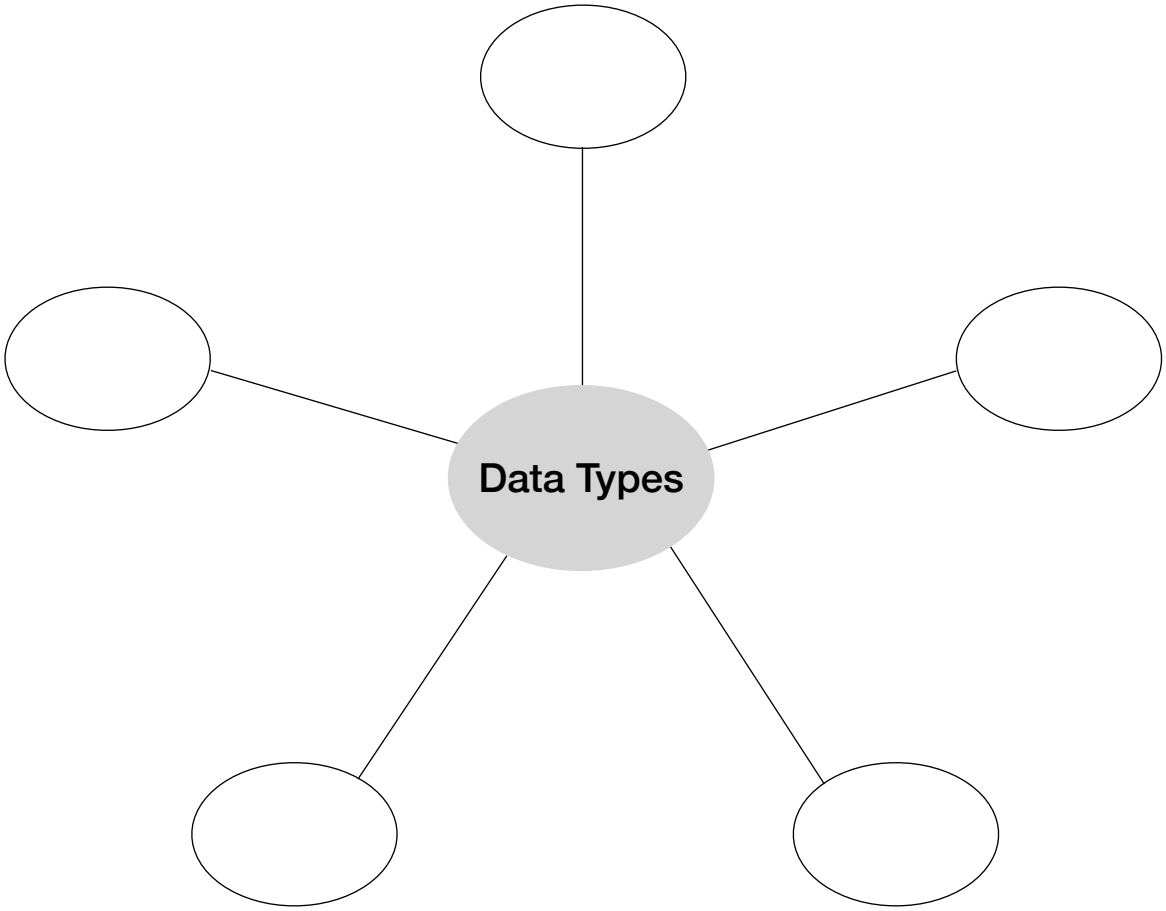
Date completed: _____

How do you feel about this topic?

Reflection: What did you do well? What do you need to revise?

Data Types: Mind Map

Label the sub-nodes for the 5 common data types and add branches to give examples and details for each type. For example, data types may have length limits and limitations.



Date completed: _____

How do you feel about this topic?

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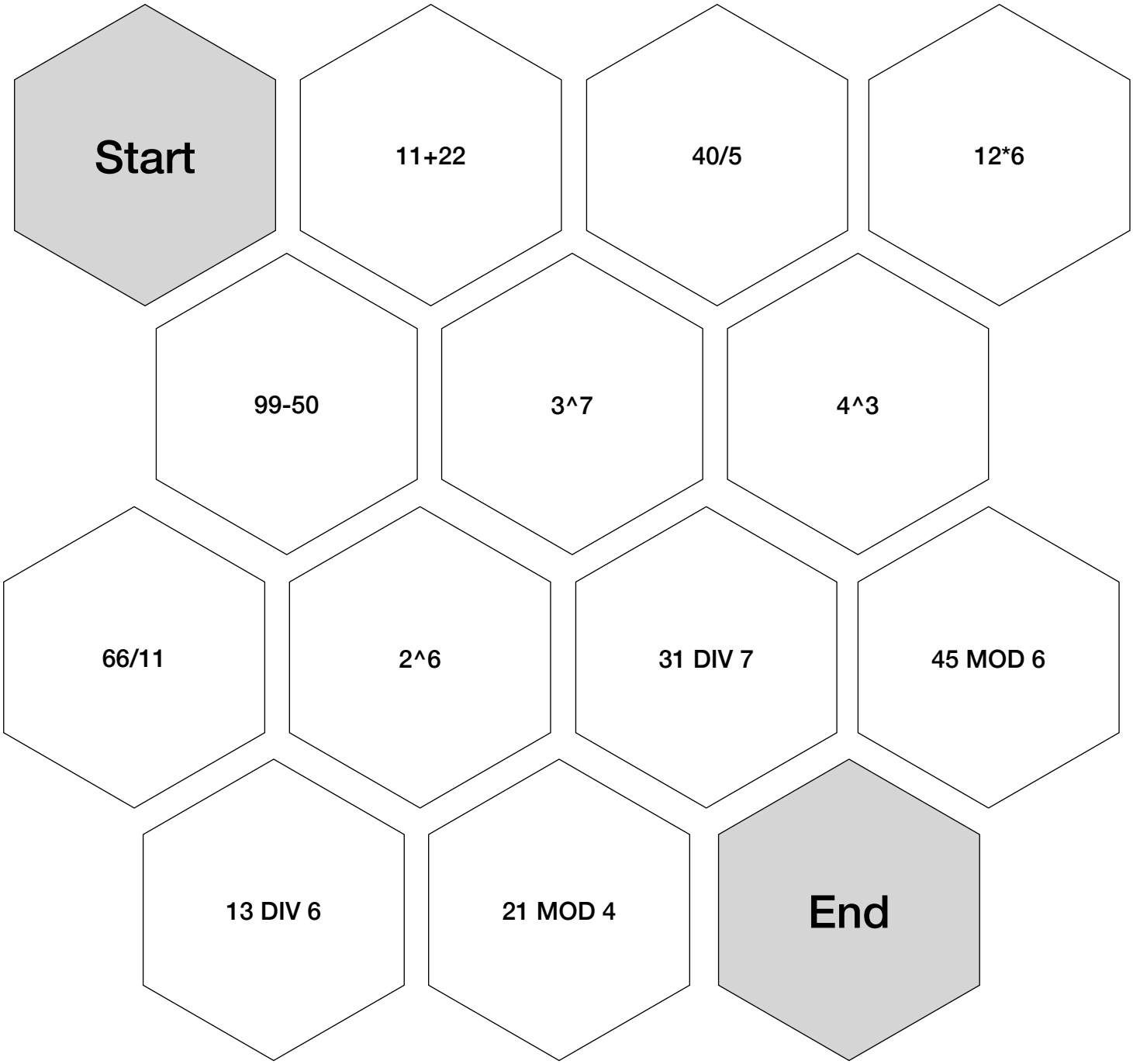
Reflection: What did you do well? What do you need to revise?

Arithmetic Operators: Blockbusters

Starting in the top left hand corner, make a path of correct answers to the end point in the bottom right hand corner. Use those you cannot answer to aid your revision. Write down the answers if you find it beneficial.



Date completed: _____

How do you feel about this topic?

😀 ☐ 😐 ☐ 😕 ☐

Reflection: What did you do well? What do you need to revise?

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Programming Terminology: Cops & Robbers

In the cops column (middle) write as much as you can remember about each programming term. In the robbers column (right), steal something you forgot from a neighbour (or book if you are working independently).

		
Sequence		
Iteration		
Selection		
Variable		
Constant		
Sub-routine		
Scope		

Date completed: _____

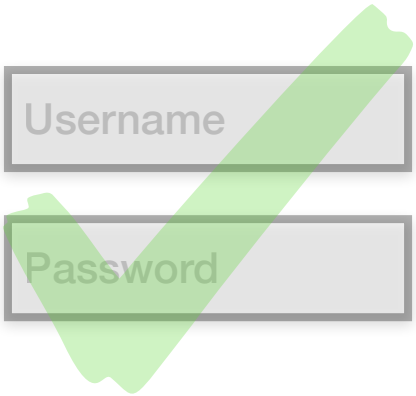
How do you feel about this topic?

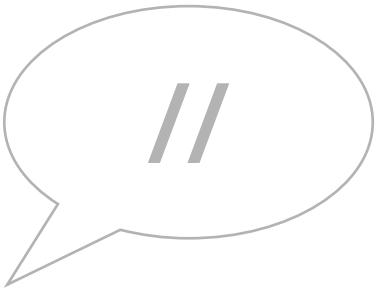
 ☐  ☐  ☐

Reflection: What did you do well? What do you need to revise?

Defensive Design & Maintaining Programs: Picture Prompt

There are steps that programmers can take to ensure their applications are secure, and to ensure that their applications are easy to maintain. Use the picture prompts to help you identify these steps. For each one, explain its importance and how it can be used to secure or help maintain an application.





Date completed: _____

How do you feel about this topic?

😀 ☐ 😐 ☐ 🙁 ☐

Reflection: What did you do well? What do you need to revise?

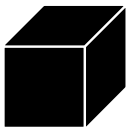
Testing: Brain Dump

Write as much as you can remember for each box below. This activity is to help you identify what you can remember about the topic.

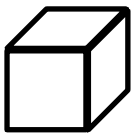
What is the purpose of a test plan?

Why do programs need to be tested before they are released?

Black Box Testing



White Box Testing



Date completed: _____

How do you feel about this topic?

😀 ☐ 😐 ☐ 😕 ☐

Reflection: What did you do well? What do you need to revise?

Binary Logic: Brain Dump

Fill in the table for the three logic gates then fill in the boxes beneath the table. This activity is to help you identify what you can remember about the topic.

Gate	Symbol	Notation	Example
NOT			
AND			
OR			

Explain the purpose of a truth table

Draw an example of a simple truth table

Date completed: _____

How do you feel about this topic?

😀 ☐ 😐 ☐ 😕 ☐

Reflection: What did you do well? What do you need to revise?

_____

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Binary Logic: Challenge Grid

Work your way through the questions. Try and get as many points as you can. Write the answers in the boxes

Truth Table: A AND B **1 Point**	Truth Table: A OR B **1 Point**	Truth Table: NOT A **1 Point**	Truth Table: NOT A OR B **2 Points**
Logic Diagram: A AND B **1 Point**	Logic Diagram: A OR B **1 Point**	Logic Diagram: NOT A **1 Point**	Logic Diagram: NOT A OR B **2 Points**
Logic Diagram: A AND B AND NOT C **3 Points**	Logic Diagram: NOT A OR B AND C **3 Points**	Truth Table: NOT A AND B OR C **3 Points**	Truth Table: NOT A AND B AND C **3 Points**

Date completed: _____

How do you feel about this topic?

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Reflection: What did you do well? What do you need to revise?

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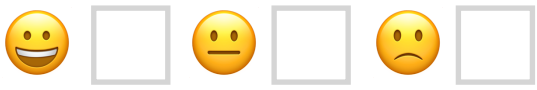
Low & High Level Programming Languages: Retrieval Grid

Fill in each box in the grid with what you can remember about the features of main memory.

What is assembly language directly translated to?	What are the benefits of assembly language over how computers were programmed previously?	With assembly languages, one instruction equals....	What are the advantages of low level languages?
What are the drawbacks of low level languages?	Give three examples of high level languages.	What is the main benefit of programming with a high level languages as opposed to low level languages?	With a high level languages, one instruction equals...
What are the advantages of high level programming languages?	What are the drawbacks of high level languages?	Which programs are more likely to be platform agnostic: those written in low level languages or high level languages?	Which programs are more memory efficient: those written in low level languages or high level languages?

Date completed: _____

How do you feel about this topic?



Reflection: What did you do well? What do you need to revise?

Assemblers, Compliers, Interpreters: Cops & Robbers

In the cops column (middle) write as much as you can remember about the different translators. In the robbers column (right), steal something you forgot from a neighbour (or book if you are working independently).

		
Assemblers		
Compilers		
Interpreters		

Date completed: _____

How do you feel about this topic?

 ☐  ☐  ☐

Reflection: What did you do well? What do you need to revise?

Integrated Development Environments: Lists

List the different features IDEs offer and the ways they can help programmers.

List the features that can be found in IDEs

Admin$ _

List different ways the IDEs can make a programmer's job easier

Date completed: _____

How do you feel about this topic?

Reflection: What did you do well? What do you need to revise?

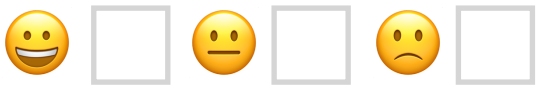
Units: Challenge Grid

Work your way through the questions. Try and get as many points as you can. Write the answers in the boxes

How many bits are there in a nibble? **1 Point**	How many bits are there in a byte? **1 Point**	How many bytes are there in a kilobyte? **1 Point**	How many bits are there in a kilobyte? **2 Points**
How many bits are there in a megabyte? **2 Points**	How many kilobytes are there in a megabyte? **1 Point**	How many megabytes are there in a terabyte? **2 Points**	How many kilobytes are there in a terabyte? **3 Points**
How many nibbles are there in a megabyte? **3 Points**	How many bits are there in 2 megabytes? **3 Points**	How many megabytes are there in 10 terabytes? **3 Points**	How many nibbles are there in a byte? **1 Points**

Date completed: _____

How do you feel about this topic?



Reflection: What did you do well? What do you need to revise?

Binary vs Decimal: Brain Dump

Read the questions and answer each as best you can for both Binary and Decimal number systems

Binary

What numbers does the binary number system use?

Why is binary well suited for use by computers?

Why is binary poorly suited for use by humans?

Decimal

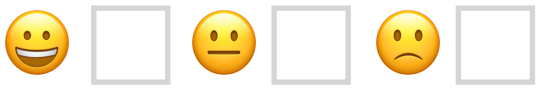
What numbers does decimal number system use?

Why is decimal well suited for use by humans?

Why is decimal poorly suited for use by computers?

Date completed: _____

How do you feel about this topic?



Reflection: What did you do well? What do you need to revise?

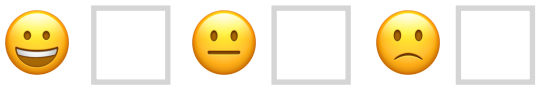
Binary to Decimal (and back again): Challenge Grid

Work your way through the questions. Try and get as many points as you can. Write the answers in the boxes

Convert 1011 to Decimal **1 Point**	Convert 1111 to Decimal **1 Point**	Convert 0011 1100 to decimal **2 Points**	Convert 1101 1100 to decimal **2 Points**
Convert 12 to binary **1 Point**	Convert 9 to binary **1 Point**	Convert 71 to binary **2 Points**	Convert 113 to binary **2 Points**

Date completed: _____

How do you feel about this topic?



Reflection: What did you do well? What do you need to revise?

Hexadecimal: Tell me 4

Write down 4 things about hexadecimal. The box headings will help you retrieve the key information.

1. Which numbers does Hexadecimal use?

2. Why is Hexadecimal useful for representing binary numbers?

3. How many bits can each Hexadecimal digit represent?

4. List examples of practical Hexadecimal applications.

Date completed: _____

How do you feel about this topic?

Reflection: What did you do well? What do you need to revise?

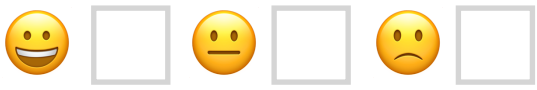
Binary to Hexadecimal (and back again): Challenge Grid

Work your way through the questions. Try and get as many points as you can. Write the answers in the boxes

Convert 1101 to Hexadecimal **1 Point**	Convert 1001 to Hexadecimal **1 Point**	Convert 0101 1001 to Hexadecimal **2 Points**	Convert 0101 1001 to Hexadecimal **2 Points**
Convert A9 to binary **1 Point**	Convert 6F to binary **1 Point**	Convert AF to binary **2 Points**	Convert BE to binary **2 Points**

Date completed: _____

How do you feel about this topic?



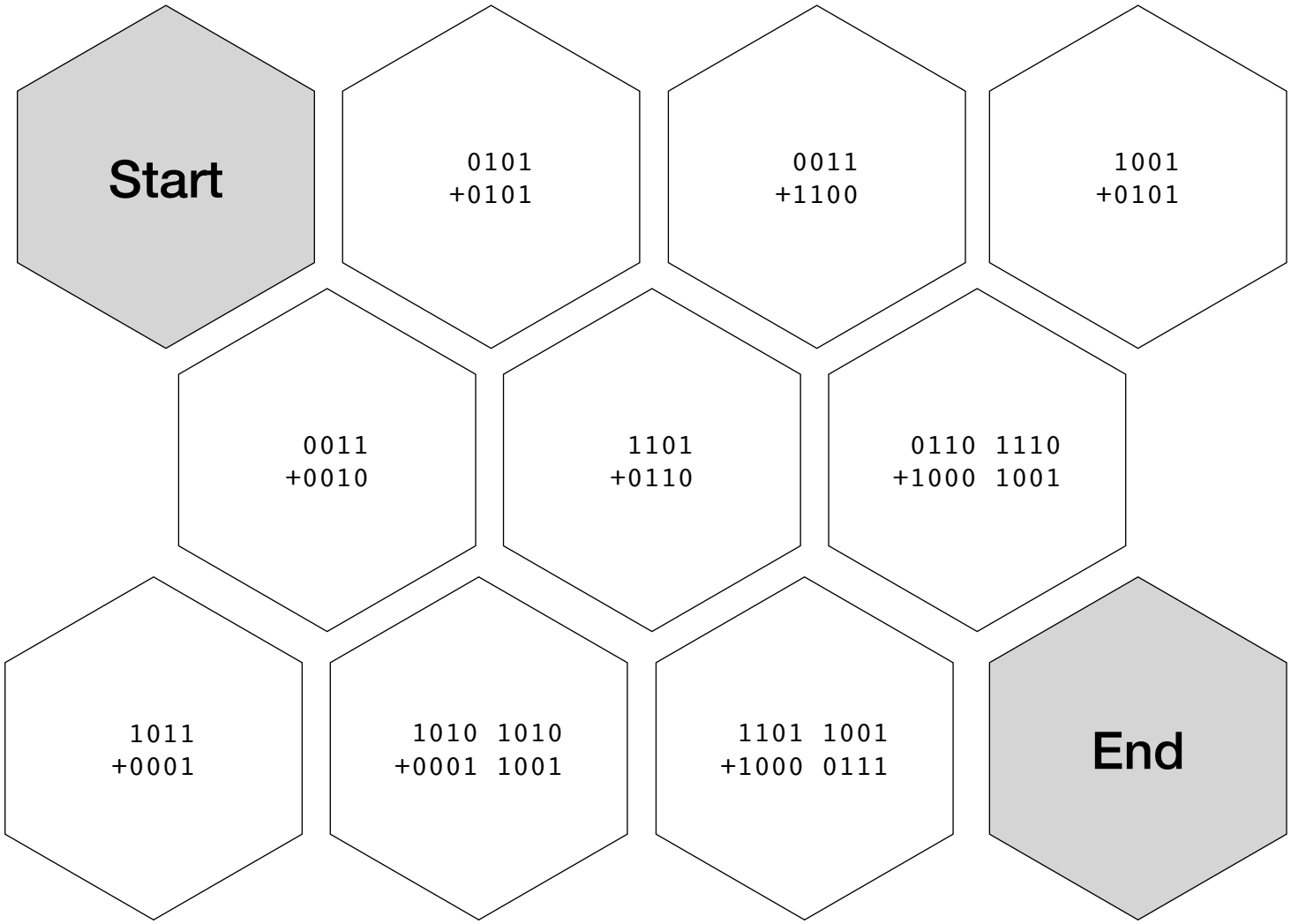
Reflection: What did you do well? What do you need to revise?

Binary Addition: Blockbuster

Write in the rules for binary addition at the top in the boxes provided then starting in the top left hand corner try to make a path of correct answers to the end point in the bottom right hand corner. Write down the answers if you find it beneficial.

0+0 = ☐ 0+1 = ☐ 1+0 = ☐

1+1 = ☐ 1+1+1 = ☐



Date completed: _____

How do you feel about this topic?

😀 ☐ 😐 ☐ ☹ ☐

Reflection: What did you do well? What do you need to revise?

Binary Shift: Create your own questions

Create a question that would satisfy the statement on each row, use 8 bit binary numbers for all your questions. Once you have question for each row, swap with a partner so they can check your questions.

Statement	Question
The answer is double the original number	0011 0011 Shift to the left once
The answer is 4 times the original number	
The answer is half the original number	
The answer overflows	
The answer underflows	
The answer is an eighth the original number without underflowing	

Date completed: _____

How do you feel about this topic?

😀 ☐ 😐 ☐ 🙁 ☐

Reflection: What did you do well? What do you need to revise?

Characters: Cops & Robbers

In the cops column (middle) write as much as you can remember about the three different topics on characters. In the robbers column (right), steal something from a neighbour (or book if you are working independently).

		
Problems before we used ASCII		
ASCII		
Unicode		

Date completed: _____

How do you feel about this topic?

😀 ☐ 😐 ☐ 😕 ☐

Reflection: What did you do well? What do you need to revise?

Graphics: Brain Dump

Write as much as you can remember about the different graphics terms below. This activity is to help you identify what you can remember about the topic.

Term	What you know
Pixels	
Resolution	
Colour Depth	
Meta Data	
Compression	

Date completed: _____

How do you feel about this topic?

 ☐  ☐  ☐

Reflection: What did you do well? What do you need to revise?

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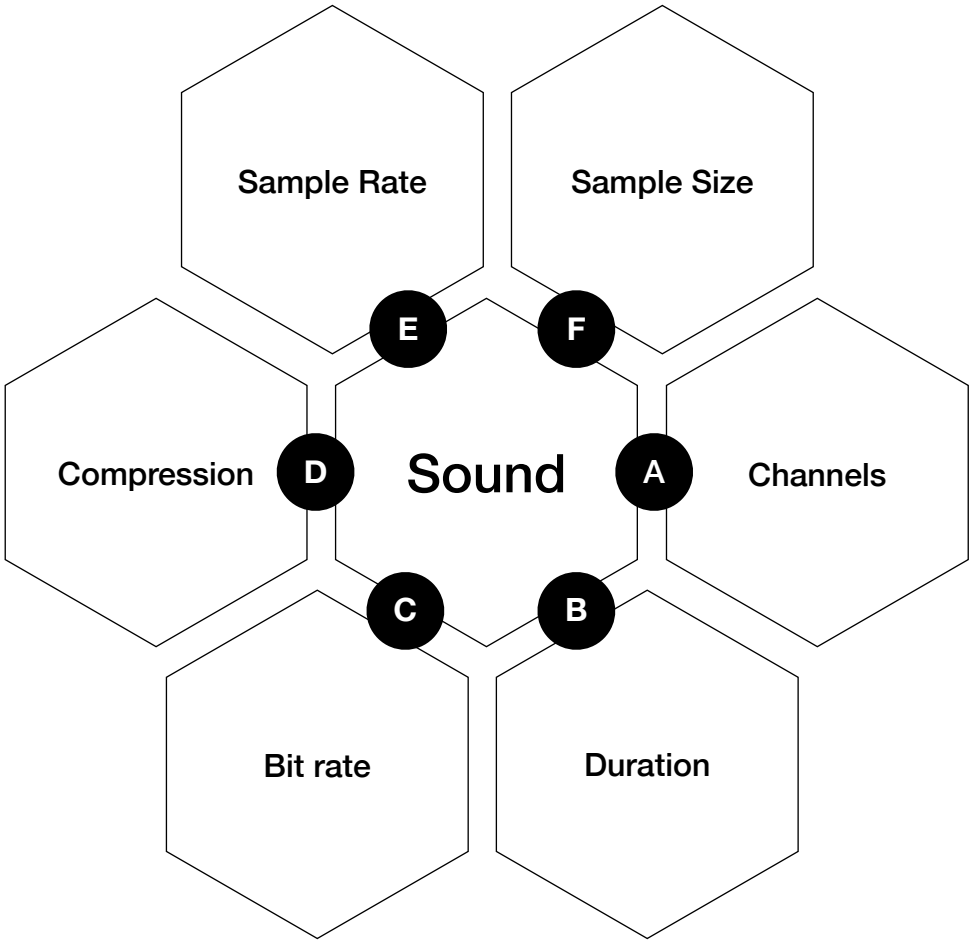
Sound: Connections

The size and quality of sound files can be impacted by a range of different factors. Explain how each of the following factors can affect the size and quality of a recorded sound file.



	Factor
A	
B	
C	

	Factor
D	
E	
F	

Date completed: _____

How do you feel about this topic?

😀 ☐ 😐 ☐ 😕 ☐

Reflection: What did you do well? What do you need to revise?