

INFORMATION TECHNOLOGY & COMPUTING

STUDY PACK

HCUC

A merger between Uxbridge College and Harrow College

Harrow
COLLEGE

UC
UXBRIDGE
COLLEGE

CREATIVE MEDIA PRODUCTION

CREATE THE FUTURE DIGITALLY!

Welcome to the fantastic world of Information Technology & Computing.

This Study Pack is to help you with your transition to college from school and give you a taste of what there is waiting for you at Harrow College & Uxbridge College (HCUC)

The activities here are typical of what students will be tasked with in college – See if you can complete all of the challenges!

Challenge 1: PROBLEM SOLVING SKILLS – WHODUNNIT?

Use your problem-solving skills to see who committed the crime
This is called **Pseudo-code** and is used to develop large programs

THE SUSPECTS

- Professor Plum
- Reverend Green
- Miss Scarlet
- Mrs Peacock
- Mr Black

Doctor Pink has been found murdered downstairs in the Kitchen, battered by some lead piping, at 20:00 hours. By a process of elimination find out **whodunnit** by looking at the following pseudo-code.

```
IF TimeFound < 21:00 THEN
    IF (Location = Downstairs) AND (weapon=knife) THEN
        Reverend Green = innocent
    END IF
    IF (Location = Downstairs) OR (weapon=knife) THEN
        Mr Black = innocent
    ELSE
        Miss Scarlet=Innocent
    ENDIF
ELSE
    Professor Plum = innocent
END IF

IF Location<>Conservatory THEN
    IF Location=Kitchen THEN
        CASE Weapon of
            Gun: Mr Black=innocent
            Candlestick: Reverend Green = innocent
            Lead Piping: Mrs Peacock = innocent
            Rope: Professor Plum=innocent
        END CASE
    END IF
    IF (location<> upstairs) AND (TimeFound>12:00) Then
        Professor Plum = innocent
        IF location=kitchen THEN
            Miss Scarlet=innocent
        ENDIF
    ELSE
        Mr Black = innocent
    ENDIF
END IF
```

THE CULPRIT WAS: _____

Challenge 2: FUN WITH EMERGING TECHNOLOGIES!

Now for some fun – Using your knowledge of new technologies and your imagination, go through the table below and describe the usual purpose these items have.

Describe the benefits of them and.... Think how you could use these devices / items elsewhere to good effect!

A lot of the time, Computer devices are introduced for entertainment purposes (like games) or to make life a little easier (like microwave ovens).

However, the aims of HCI relate to more important factors. This can range from enabling a system to be accessed by all or even saving lives.

TASK

Go through the HCI developments below and identify their purpose and benefits provided.

To further build your task, describe how these devices could be used in an alternate way to provide even more support.

HCI Name:	Main Purpose and Benefits:	Alternative Uses:
iPhone Siri		
Q.R Codes		
Mind-Control Gaming Headset		
Oculus Rift VR Headset		
Google Translate		
Hubble Telescope		
Mars Rover		
Augmented Reality		
Kinect Sensor		

Challenge 3: DO YOU KNOW?

Interesting facts on Computing and technology – See how many you can answer correctly

1. Who was the very first programmer?
2. What is the difference between a current CPU and a Quantum processor? (This is a tough one!)
3. Which company makes the XBOX? (Not as obvious as you may think)
4. What is the longest word that you can write only using the letters on one row of your keyboard?
5. Name 5 operating systems – and explain why your favourite is ‘better’ than the rest – Use the icons below as a guide



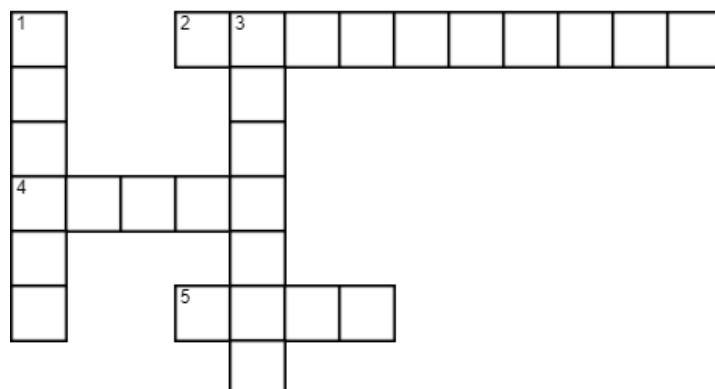
6. Who launched the company Pixar?
7. Fill in the gaps to reveal computer devices

- a. H _ _ D D _ _ V _
- b. P _ _ C E _ S O _
- c. K _ _ B O A _ _
- d. _ O U _ _
- e. M O _ I T _ _

8. See if you can find the Office Applications in the crossword below

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Office Applications



Challenge 4: THE ULTIMATE CHALLENGE!

This is a tough one! This is called Cryptarithmic and the oldest form of Encryption that there is. All encryption today works on the same principles as this.

Study the rules and try and complete the tasks – If you get stuck there are Cryptarithmic calculators online.

CRYPTARITHMETIC

What is cryptarithmic?

Cryptarithmic is the science and art of creating and solving cryptarithms. A cryptarithm is a genre of mathematical puzzle in which the digits are replaced by letters of the alphabet or other symbols.

The invention of Cryptarithmic has been ascribed to ancient China. This art was originally known as letter arithmetic or verbal arithmetic. In India, during the Middle Ages, were developed the arithmetical restorations or “skeletons” a type of cryptarithms in which most or all of the digits have been replaced by asterisks.

A type of alphametic addition puzzle termed “doubly-true” was introduced in 1945 by Alan Wayne. It is made up of “number words” that, when read, also form a valid sum.

Rules

- Single left-hand digit always 1 in addition
- Each letter or symbol represents only one digit throughout the problem;
- When letters are replaced by their digits, the resultant arithmetical operation must be correct;
- The numerical base, unless specifically stated, is 10;
- Numbers must not begin with a zero;
- There must be only one solution to the problem
- Two same digits added together must always equal an even number

Work out these examples:

Example 1

$$\begin{array}{r}
 \\
 + \\
 \hline
 0
 \end{array}$$

0	1	2	3	4	5	6	7	8	9

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Example 2

$$\begin{array}{r}
 \\
 + \\
 \hline

 \end{array}$$

Example 3

$$\begin{array}{r}
 \\
 + \\
 \hline

 \end{array}$$

MPLES

COMPUTER SCIENCE

Subjects:

- Principles of Computer Science
- Fundamentals of Computer Systems
- Planning and Management of Computing Projects
- Software Design and Development Project
- Building Computer Systems
- IT Systems Security
- IT Systems Security and Encryption
- Human-computer Interaction
- Website Development
- Object-oriented Programming
- Mobile Apps Development
- Relational Database Development
- Web Application Development
- Computer Forensics
- Business Applications of Social Media
- The Impact of Computing

SOFTWARE DEVELOPMENT

Subjects:

- Communication & Employability Skills
- Computer Systems
- Information Systems
- Software Design & Development
- Event Driven Programming
- I.T Project Management
- Database Development
- Computer Games Development
- Human Computer Interaction
- Maintaining Computer Systems
- Website Production
- Installing and Upgrading Software
- Digital Graphics
- Computer Animation
- 2D Animation Production
- Computer Game Design
- Spreadsheet Modelling
- Computer Game Platforms

COMPUTING & CYBER

Subjects:

- Communication & Employability Skills
- Computer Systems
- Information Systems
- Computer Networks
- Managing Networks
- Software Design & Development
- I.T Project Management
- Database Development
- Human Computer Interaction
- Maintaining Computer Systems
- Installing and Upgrading Software
- Spreadsheet Modelling
- Communication Technologies
- I.T Troubleshooting
- I.T Systems Support
- Network Systems Security
- Organisational Systems Security
- Computer Systems Architecture

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