Computing - Summer workbook

Welcome to the Computing course!! You are obviously curious about how computers work and want to build real tech skills, and this is why our Level 3 Extended Certificate in Computing is a great choice!

You'll learn about coding, computer science, network security, and how people interact with technology (HCI).

The course is hands-on and helps you solve real problems using logic and creativity. You'll explore how to protect systems from cyber threats, understand how data is encrypted, and design user-friendly apps and websites. Whether you want to go to university, start an apprenticeship, or get a job in tech, this course gives you the skills to succeed.

Past students have gone on to study exciting subjects like Ethical Hacking and Game Development or joined top companies like Amazon and AstraZeneca!

Within the course you will discover the core principles that underpin all areas of computer science and develop computational-thinking and coding skills which will be put to the test as you solve problems. You will explore computer network security and encryption methods investigating network types, security threats, and encryption techniques.

Contents

Course details:

Full course title: Pearson BTEC Level 3 National Extended Certificate in Computing (AAQ)

Exam Board: Edexcel

What you will be studying:

There are 4 mandatory units.

Two externally examined units (assessed by written examination) worth 66% of the course:

- Unit 1: Programming Fundamentals
- Unit 2: Computer Network Security and Encryption

The units assessed internally (coursework) worth 34% of the course are:

- Unit 3: Human-Computer Interaction (HCI)
- Unit 4: Practical Programming

Why did you choose Computing?

In this task you get the opportunity to tell me your choices and reasons behind choosing to study Computing. Please answer all questions as best you can.

1. Why did you choose to study BTEC Level 3 Computing?

2. What other courses have you chosen to study at Key Stage 5, and what made you choose this combination?

3. What are you hoping to achieve from studying BTEC Computing?

4. How would you describe yourself as a learner at GCSE? What skills where you good at, what areas would you like to improve on?

5. What are your other hobbies and interests outside of school? Anything related to Computing?

Investigating Human-Computer Interfaces

Your objective is to Understand the concept, evolution, and future of Human-Computer Interfaces (HCIs)

Research Topics (Choose One or More):

1. The Evolution of Human-Computer Interfaces
   How have HCIs changed from the 1960s to today?
2. Touchscreens and Gesture-Based Interfaces
   How do modern devices use touch and gestures to interact with users?
3. Voice and Natural Language Interfaces
   How do systems like Siri, Alexa, or Copilot understand and respond to human speech?
4. Brain-Computer Interfaces (BCIs)
   What are BCIs, and how might they change the way we interact with technology?
5. Designing Accessible Interfaces
   How can HCIs be designed to support users with disabilities?

Research Steps:

- Start with a Reliable Source
  Visit this page to get an overview of interface design:
  - Ada Computer Science – Design Interfaces
- Define Key Terms
  Write down definitions for:
  - Human-Computer Interface (HCI)
  - User Interface (UI)
  - Usability
  - Accessibility
- Find Real-World Examples
  Look for 2–3 examples of your chosen topic in action (e.g., smartphones, VR headsets, assistive tech).
  - Make a list of all the websites or books you used as part of your research
    1. < https://adacomputerscience.org/concepts/design_interfaces>
- Explore the Impact
  Consider how your topic affect:

  - Everyday users
  - People with disabilities
  - Future technology trends

- Summarise Your Findings
  Create a short summary (written or visual) that includes:
  - What you learned
  - Why it matters
  - One question you still have

An introduction to the basics of programming

Learning to "code" is a fun and essential part of BTEC Computing.

This task is ideal if you haven't done the GCSE in Computer Science, or you simply want a nice refresher ahead of starting your BTEC Computing course.

1. Head over to the web site: https://www.learnpython.org/
2. Complete the following python tutorials under the heading:

    - Hello, World!
    - Variables and Types
    - Lists
    - Basic Operators
    - String Formatting
    - Basic String Operations
    - Conditions
    - Loops
    - Functions

Each section presents you with theory, code to run and exercises to try out.

If you want to practice writing your own python programs you can download and install a simple python development tool here: https://www.python.org/downloads/

Taking it further

There are some amazing online courses to take your coding further, such as

Python Tkinter - GeeksforGeeks .

If you attempt any coding projects, please tell us about those you try, and add details about what you have done here!!