WELCOME TO A LEVEL COMPUTER SCIENCE

TODAY

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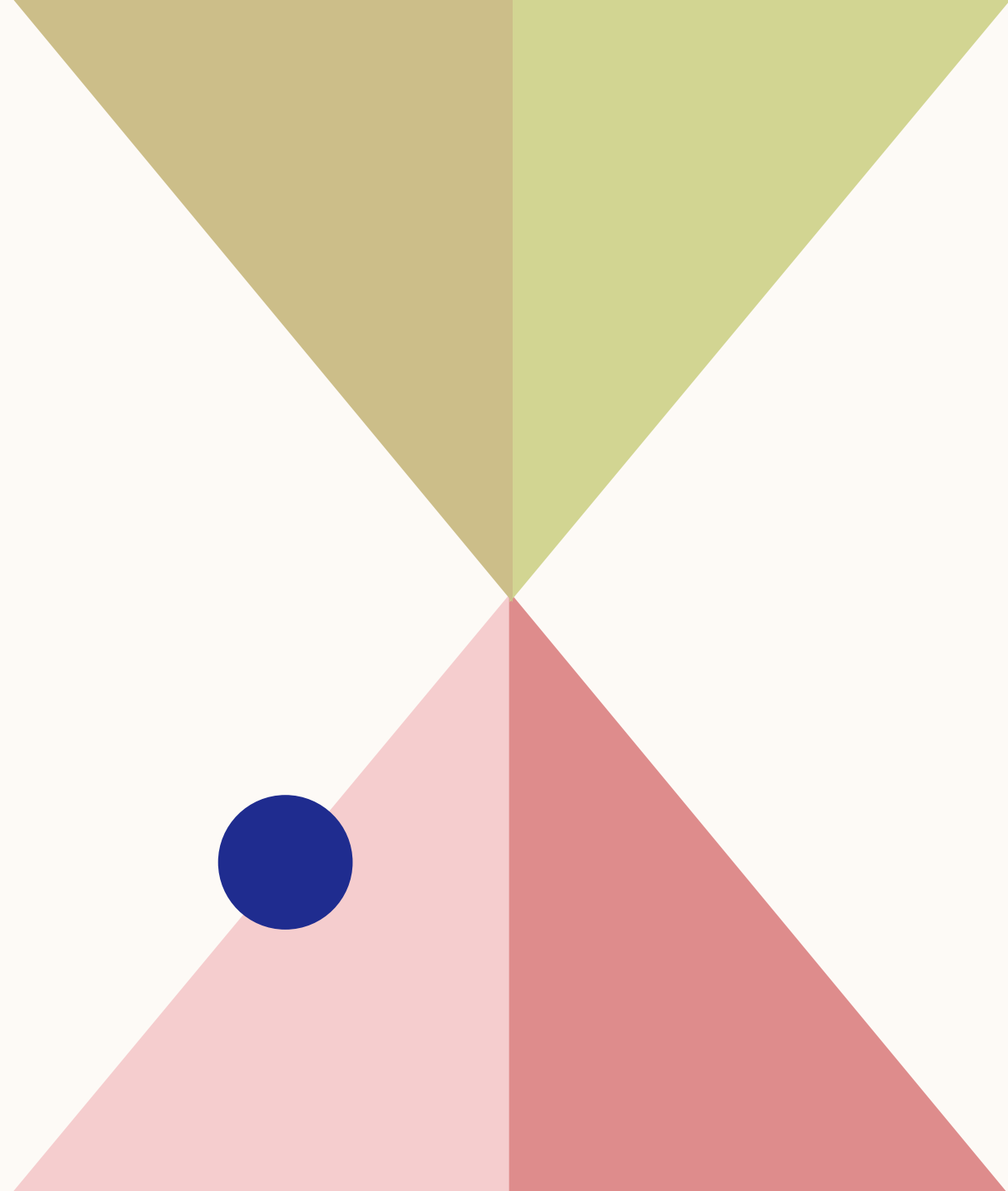


Mrs Murfin
(Head of the computer Science department)

Mrs Jacobs
(Computer Science teacher)

WELCOME TO COMPUTER SCIENCE

The Computer Science course is 10 lessons over a 2 week cycle (teaching time) taught in room 201.

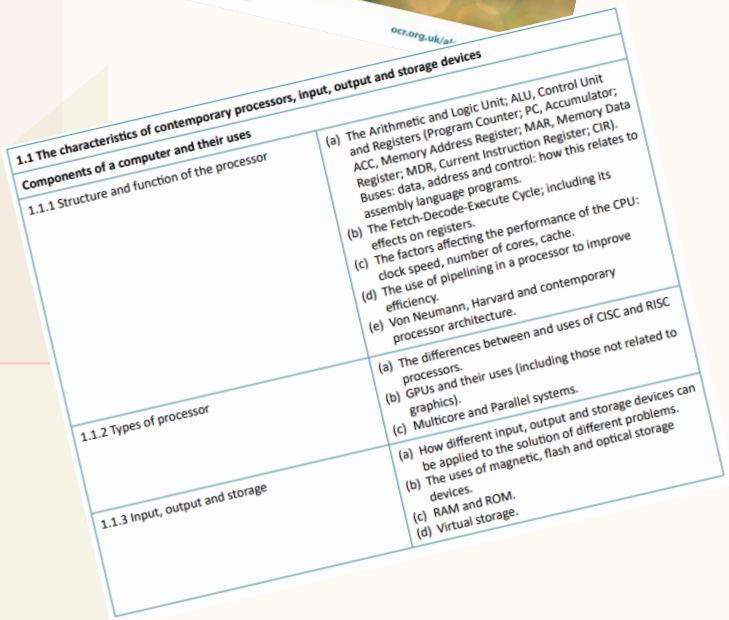
The lessons are split between Mrs Murfin and Mrs Jacobs (5 lessons each over 2 weeks).

Mrs Murfin teaches paper 2 and a section of paper 1 (exchanging data) & the project.

Mrs Jacobs teaches paper 1 & the project

SPECIFICATION

Computer systems (01)	Algorithms and programming (02)	Programming project 03
1.1 The characteristics of contemporary processors	2.1 Elements of computational thinking	Analysis of the problem
1.2 Software and software development	2.2 Problem solving and programming	Design of the solution
1.3 Exchanging data	2.3 Algorithms to solve problems and standard algorithms	Developing the solution
1.4 Data types, data structures and algorithms		Evaluation
1.5 Legal, moral, cultural and ethical issues		



1.1 The characteristics of contemporary processors, input, output and storage devices	
Components of a computer and their uses	
1.1.1 Structure and function of the processor	(a) The Arithmetic and Logic Unit; ALU, Control Unit and Registers (Program Counter; PC, Accumulator; ACC, Memory Address Register; MAR, Memory Data Register; MDR, Current Instruction Register; CIR). Buses: data, address and control: how this relates to assembly language programs. (b) The Fetch-Decode-Execute Cycle; including its effects on registers. (c) The factors affecting the performance of the CPU: clock speed, number of cores, cache. (d) The use of pipelining in a processor to improve efficiency. (e) Von Neumann, Harvard and contemporary processor architecture.
1.1.2 Types of processor	(a) The differences between and uses of CISC and RISC processors. (b) GPUs and their uses (including those not related to graphics). (c) Multicore and Parallel systems.
1.1.3 Input, output and storage	(a) How different input, output and storage devices can be applied to the solution of different problems. (b) The uses of magnetic, flash and optical storage devices. (c) RAM and ROM. (d) Virtual storage.

Download the specification for more information
https://www.ocr.org.uk/Images/170844-specification-accredited-a-level-gce-computer-science-h446.pdf

ASSESSMENT

Content Overview	Assessment Overview	
• The characteristics of contemporary processors, input, output and storage devices • Software and software development • Exchanging data • Data types, data structures and algorithms • Legal, moral, cultural and ethical issues	Computer systems (01) 140 marks 2 hours and 30 minutes written paper (no calculators allowed)	**40%** of total A level
• Elements of computational thinking • Problem solving and programming • Algorithms to solve problems and standard algorithms	Algorithms and programming (02*) 140 marks 2 hours and 30 minutes written paper (no calculators allowed)	**40%** of total A level
The learner will choose a computing problem to work through according to the guidance in the specification. • Analysis of the problem • Design of the solution • Developing the solution • Evaluation	Programming project 03* – Moderated upload or 04* – Moderated postal or 80 – Carry forward (2018 onwards)* 70 marks Non-exam assessment	**20%** of total A level

DAY TO DAY LESSONS

In computer Science we use a flip learning approach to deliver the course

How Flipped Learning Work?

1. Before Class:

You will watch the Craig and Dave video lectures This introduces you to new concepts at your own pace.

You will be expected to make notes using the cornel notes method or use your own method of note taking on the set video.

2. During Class: (following lessons)

Class time is used for discussions, problem-solving, group work, and hands-on activities. At this point we will provide guidance and personalized support.

3. After Class:

You may reflect, complete projects, or extend your learning by reading around topics.

Benefits of flipped learning

Encourages active learning and student engagement

Allows for personalized instruction

Frees up class time for collaboration and deeper understanding

Students can review materials as needed

ASSESSMENTS: IN CLASS

SLRS (student learning records)

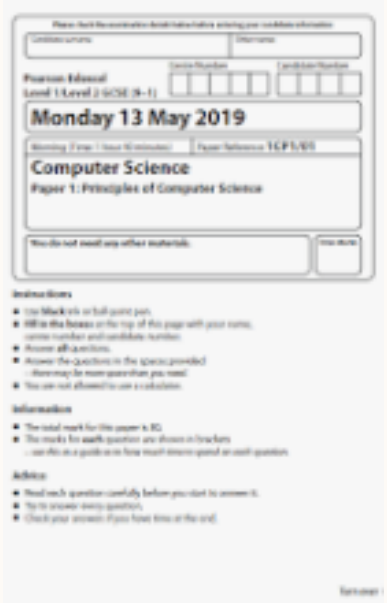
At the end of every topic you will complete a student learning record that is mapped back to the specification. These SLRs are graded by your teachers.

Here is an example of a SLR

SLR1 (AS & A) - Structure and function of the processor

End of unit assessments

At the end of each unit you will be assessed by your teacher



Mock exams

You will have at least 1 mock exam in the spring/summer term based on everything you have learnt the year so far,

Benefits of flipped learning

Encourages active learning and student engagement

Allows for personalized instruction

Frees up class time for collaboration and deeper understanding

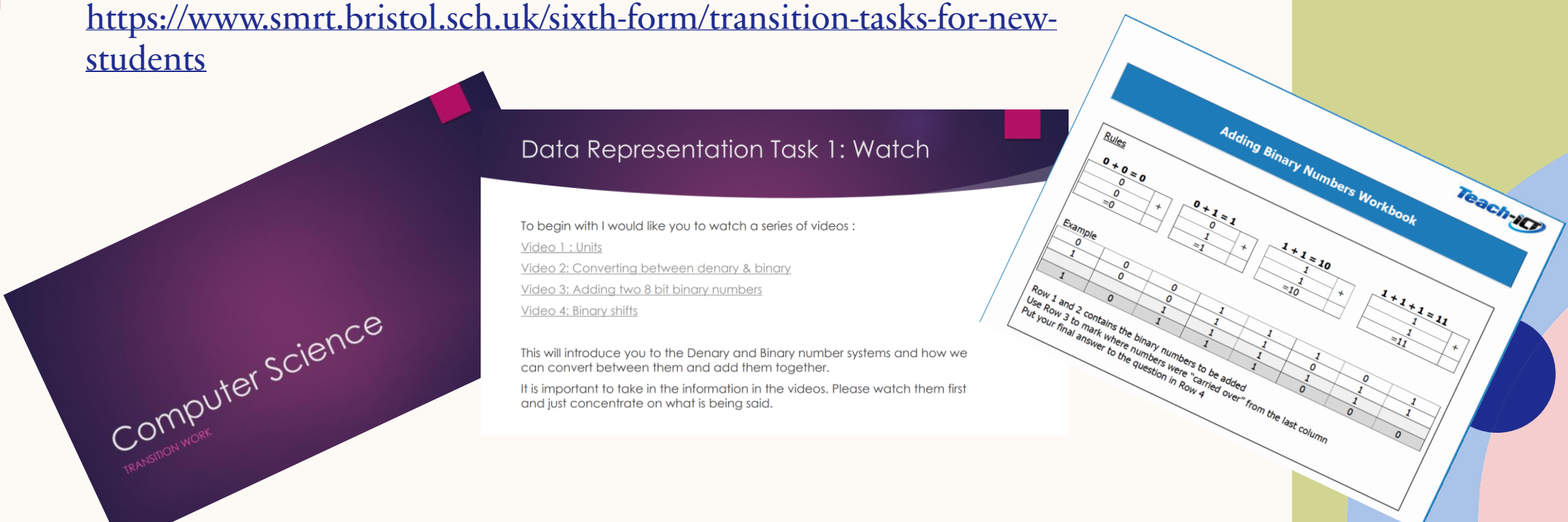
Students can review materials as needed

TRANSITION TASK

Access the transition task via this link.

The transition task will give you a taster of a theory lesson in computer Science.

https://www.smrt.bristol.sch.uk/sixth-form/transition-tasks-for-new-students



RESOURCES

Learn python

This is an Introduction to Programming course and the Advanced Course in Programming from the Department of Computer Science at the University of Helsinki.

https://programming-24.mooc.fi/part-1/1-getting-started

Another course you could use to help you learn python

https://www.w3schools.com/python/

Craig and Dave website and resources

https://craigndave.org/

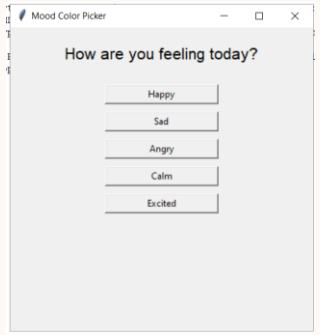
Course textbook

- OCR AS and A Level Computer Science by Pm Heathcote
- Essential algorithms and data structures by Mr David Hillyard (Author), Mr Craig Sargent (Author), Mr Andrew Fenn (Editor)

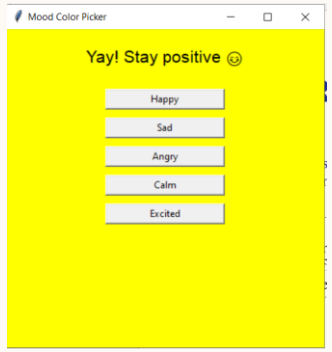
PROGRAMMING FUN
MOOD APP

Advanced programmers

Create a mood app in python using the GUI Tkinter



This is an example of the first screen you need to code.



When you click on a button the screen will change colour and a message will appear above the buttons

Intermediate Programmers

Open the file below in python and complete the following

- **Change the colours**
- **Change the buttons name**
- **Change the messages above the button**

Here is the file

Mood app

PLEASE CONTACT US IF YOU HAVE ANY QUESTIONS

Please contact us if you have any questions

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