

## Summary

### Unit 2 Computer organization

Subject	Year	Start date	Duration
Computer Science	IB1	Week 1, October	6 weeks

#### Course Part

#### Description

This unit develops student's knowledge of computer architecture and how the instructions are fetched, processed and outputted to users. Students will discover the working aspects of hardware and responsibilities of different part of the computer. Students will be able to distinguish the differences between memories in computer systems. Students will uncover the differences between OS and Application software. Students will go further and learn about how data is represented and the different methods of converting binary numbers to data used by common users. Lastly students will get involved in using logic gates to solve complex problems identifying outputs based on given inputs processed by a set of logic gates.

## Inquiry & Purpose

### Inquiry / Higher Order Questions

Type	Inquiry Questions
Debatable	Discuss the characteristics of various computer systems including single users and multi-users, in both single-tasking and multi-tasking environments.
Concept-based	Research and develop a list of discussion questions to describe the purpose and requirements of different parts of a computer system
Skills-based	Research and construct logic circuits for different types of situations providing solutions to complex problems.

## Curriculum

### Aims

Engender an awareness of the need for, and the value of, effective collaboration and communication in resolving complex problems

Develop an appreciation of the possibilities and limitations associated with continued developments in IT systems and computer science

## ◇ Objectives

### Know and understand

appropriate methods and techniques

### Apply and use

relevant design methods and techniques

### Construct, analyse, evaluate and formulate

success criteria, solution specifications including task outlines, designs and test plans

## 📖 Syllabus Content

### Core

#### Topic 2 - Computer organization

##### 2.1 Computer organization

###### Computer architecture

2.1.1 Outline the architecture of the central processing unit (CPU) and the functions of the arithmetic logic unit (ALU) and the control unit (CU) and the registers within the CPU.

2.1.2 Describe primary memory.

2.1.3 Explain the use of cache memory.

2.1.4 Explain the machine instruction cycle.

###### Secondary memory

2.1.5 Identify the need for persistent storage.

###### Operating systems and application systems

2.1.6 Describe the main functions of an operating system.

2.1.7 Outline the use of a range of application software.

2.1.8 Identify common features of applications.

###### Binary representation

2.1.9 Define the terms: bit, byte, binary, denary/decimal, hexadecimal.

2.1.10 Outline the way in which data is represented in the computer.

###### Simple logic gates

2.1.11 Define the Boolean operators: AND, OR, NOT, NAND, NOR and XOR.

2.1.12 Construct truth tables using the above operators.

2.1.13 Construct a logic diagram using AND, OR, NOT, NAND, NOR and XOR gates.

IB DP IB1 CS\_KAA HL (IB1)

## ATL Skills

### Approaches to Learning



#### Thinking

- In this unit, we will
  - give students time to think through their answers before asking them for a response
  - help students to make their thinking more visible (for example, by using a strategy such as a thinking routine)
  - include a reflection activity



#### Research

- In this unit, we will
  - reward or encourage correct citing and referencing
  - provide opportunities for students to reflect on how they determine the quality of a source, or analyse contradictory sources
  - give students advice on (or provide an opportunity for students to practise) narrowing the scope of a task to make it more manageable



## Developing IB Learners

### Learner Profile



Inquirers



Knowledgeable



Thinkers



Open-minded



Reflective

## Assessment

### Assessment criteria

#### External Assessment

Paper 1

A: Short answer questions

B: Structured questions

#### Description

During this unit student's progress will be monitored dialogue and one to one discussions. Students will also conduct group and class discussions. A variety of assessment strategies will be used to ensure all types of learner are catered for and to provide an engaging interaction. Students will also demonstrate learning by working in groups to prepare and present a slide show of a topic they are interested in within this unit, this will allow students to complete further research. All the formal summative evaluations will be marked according to IB criteria that ranges from grade 1 (very poor) to grade 7 (excellent performance).

Students assessment will include the following:

- Mini quizzes with automated feedback will be provided to ensure key skills/ concepts are reinforced.
- Project based learning will ensure students complete further research. These will include, oral presentations, podcasts, blog entries, leaflets, posters, discussion forums.
- Short question and answers based on paper 1 relevant to the topic covered.
- Students to prepare Starter/Activities to promote and engage other students in class
- Homework will be assigned as extension to learning objectives to ensure students complete further research outside of class.
  
- End of Unit Assessment will be carried out. This will provide students a final unit grade and opportunity to reflect on any improvements they need to make within this unit.