

# Summary

U Summary				
Unit 5 Abstract dat	a structures			
Subject	Year	Start date	Duration	
Computer Science	IB1	Week 1, December	12 weeks 23 hours	
Course Part				
Description				
Students should be able to	o describe the most com	imon data structures (arrays, stacks, que	eues, linked lists, binary trees) and the	е

most common data processing operations on each of the basic data structures (addition, deletion and retrieval of data, traversal, searching for a given data, sorting of data into some order).

## Curriculum

## 💮 Aims

Provide a body of knowledge, methods and techniques that characterize computer science

Develop logical and critical thinking as well as experimental, investigative and problem-solving skills

### Objectives

### Know and understand

relevant facts and concepts

appropriate methods and techniques

computer science terminology

### Apply and use

relevant facts and concepts

relevant design methods and techniques

### Construct, analyse, evaluate and formulate

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

### Syllabus Content

#### Additional higher level

Topic 5 - Abstract data structures

5.1 Abstract data structures

Thinking recursively



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- 5.1.1 Identify a situation that requires the use of recursive thinking.
- 5.1.2 Identify recursive thinking in a specified problem solution.
- 5.1.3 Trace a recursive algorithm to express a solution to a problem.

Abstract data structures

- 5.1.4 Describe the characteristics of a two-dimensional array.
- 5.1.5 Construct algorithms using two-dimensional arrays.
- 5.1.6 Describe the characteristics and applications of a stack.
- 5.1.7 Construct algorithms using the access methods of a stack.
- 5.1.8 Describe the characteristics and applications of a queue.
- 5.1.9 Construct algorithms using the access methods of a queue.
- 5.1.10 Explain the use of arrays as static stacks and queues.

Linked lists

- 5.1.11 Describe the features and characteristics of a dynamic data structure
- 5.1.12 Describe how linked lists operate logically.
- 5.1.13 Sketch linked lists (single, double and circular).

#### Trees

- 5.1.14 Describe how trees operate logically (both binary and non-binary).
- 5.1.15 Define the terms: parent, left-child, right-child, subtree, root and leaf.
- 5.1.16 State the result of inorder, postorder and preorder tree traversal.
- 5.1.17 Sketch binary trees.

#### Applications

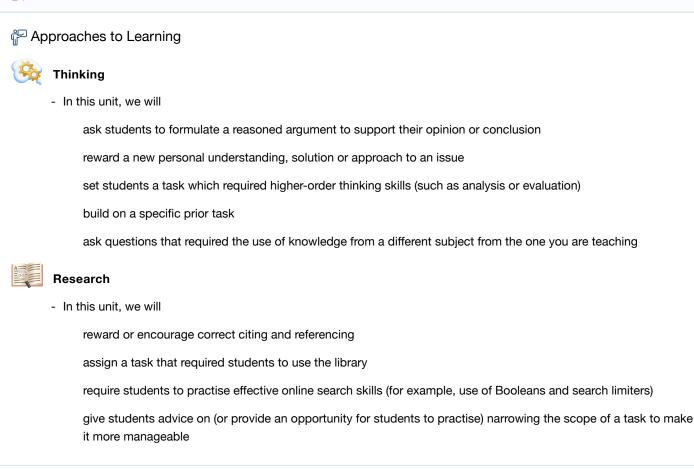
- 5.1.18 Define the term dynamic data structure.
- 5.1.19 Compare the use of static and dynamic data structures.
- 5.1.20 Suggest a suitable structure for a given situation.



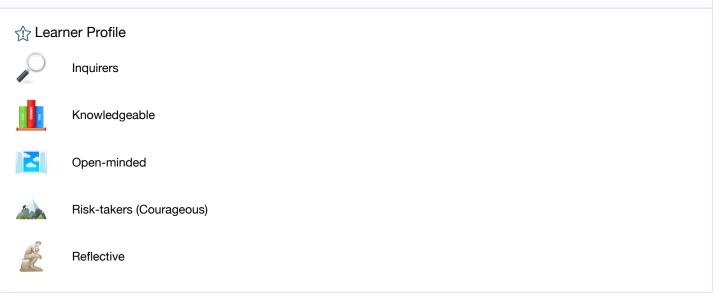
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# 🍦 ATL Skills



# 💑 Developing IB Learners





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# Assessment

🖹 Assessment criteria

## **External Assessment**

Paper 1

A: Short answer questions

**B:** Structured questions

Description