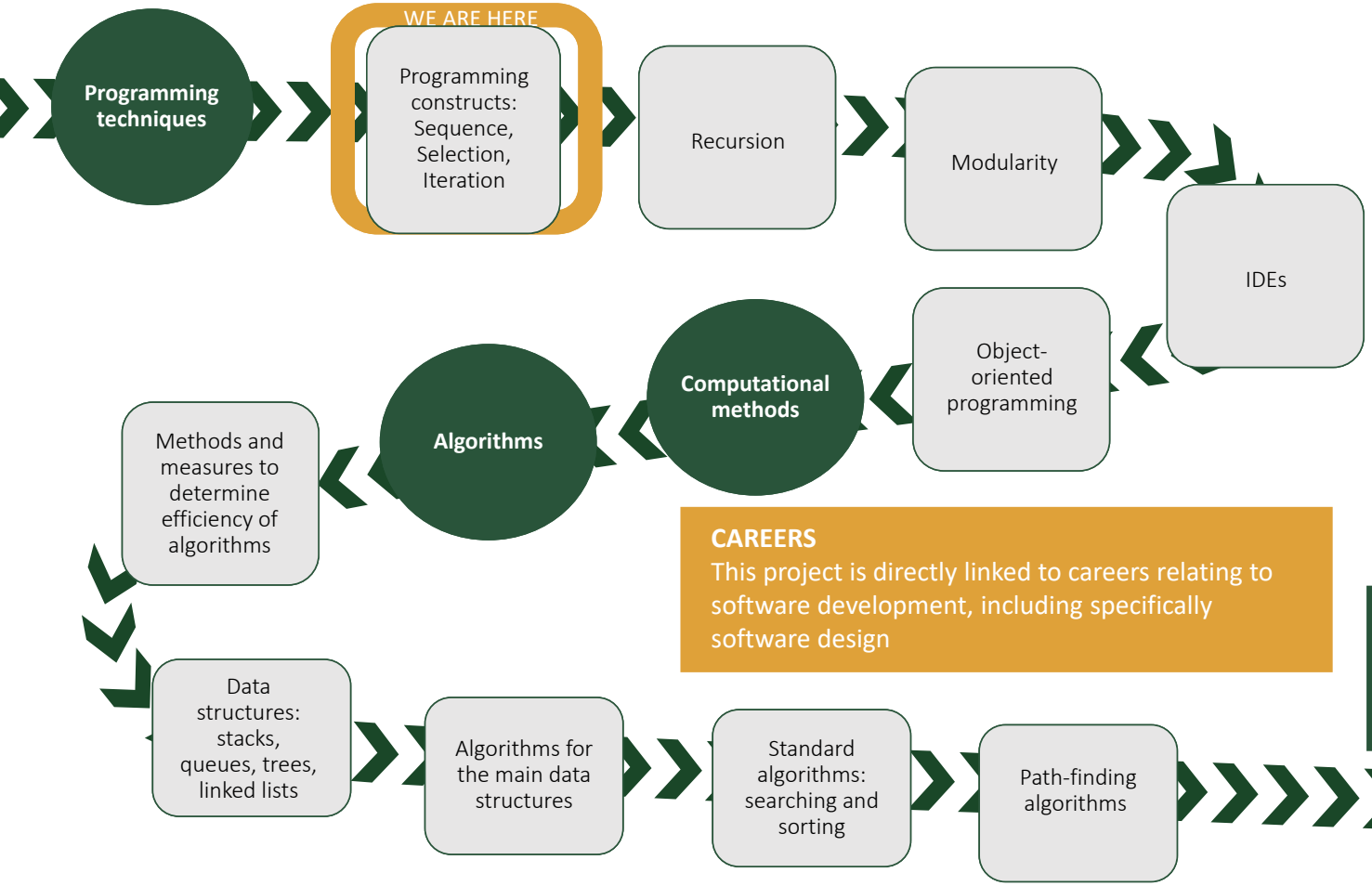
Year 12 Autumn

# LEARNING JOURNEY A LEVEL COMP SCI

## PROGRAMMING TECHNIQUES AND ALGORITHMS




In this journey, you will learn about the context of algorithms in computational thinking and its application in solving a wide variety of problems. The principles of solving problems by computational methods necessarily involve "standard" algorithms and approaches; you will be learning about these approaches on this journey, including: Big O Notation (constant, linear, polynomial, exponential and logarithmic complexity); algorithms for the main data structures, (stacks, queues, trees, linked lists, depth-first (post-order) and breadth-first traversal of trees); standard algorithms (bubble sort, insertion sort, merge sort, quick sort, Dijkstra's shortest path algorithm, A* algorithm, binary search and linear search).

**VOCABULARY: Programming techniques, computational methods, algorithms, efficiency**

**CAREERS**
This project is directly linked to careers relating to software development, including specifically software design

**TUDOR HABITS**
You will develop resilience and problem-solving skills as you proceed along this journey, along with the ability to think metacognitively about problem-solving.

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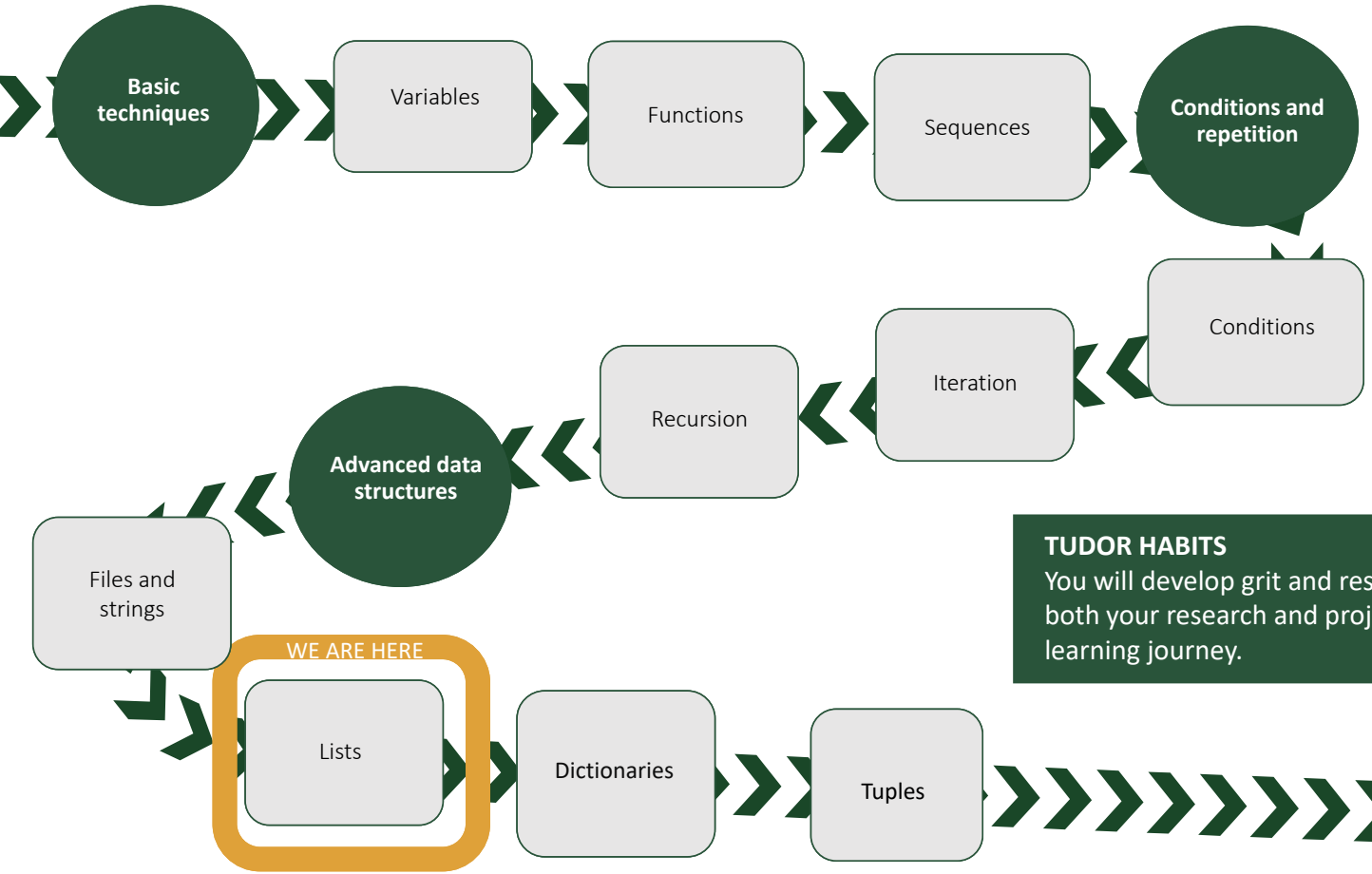
# LEARNING JOURNEY A LEVEL COMP SCI

## HOW TO THINK LIKE A COMPUTER SCIENTIST (PROGRAMMING)




This learning journey will introduce you to the programming techniques you will need to tackle the programming project in year 13. It also teaches you the thinking skills required to solve complex problems. In doing so, it links to the overarching learning journey in A level Computer Science of "computational thinking". The journey starts with basic techniques such as variables and functions, and moves on to more advanced techniques such as recursion and object-oriented programming.

**VOCABULARY: Variable, Function, Sequence, Selection/Branching, Iteration**

**TUDOR HABITS**
You will develop grit and resilience as you develop both your research and project skills on this learning journey.