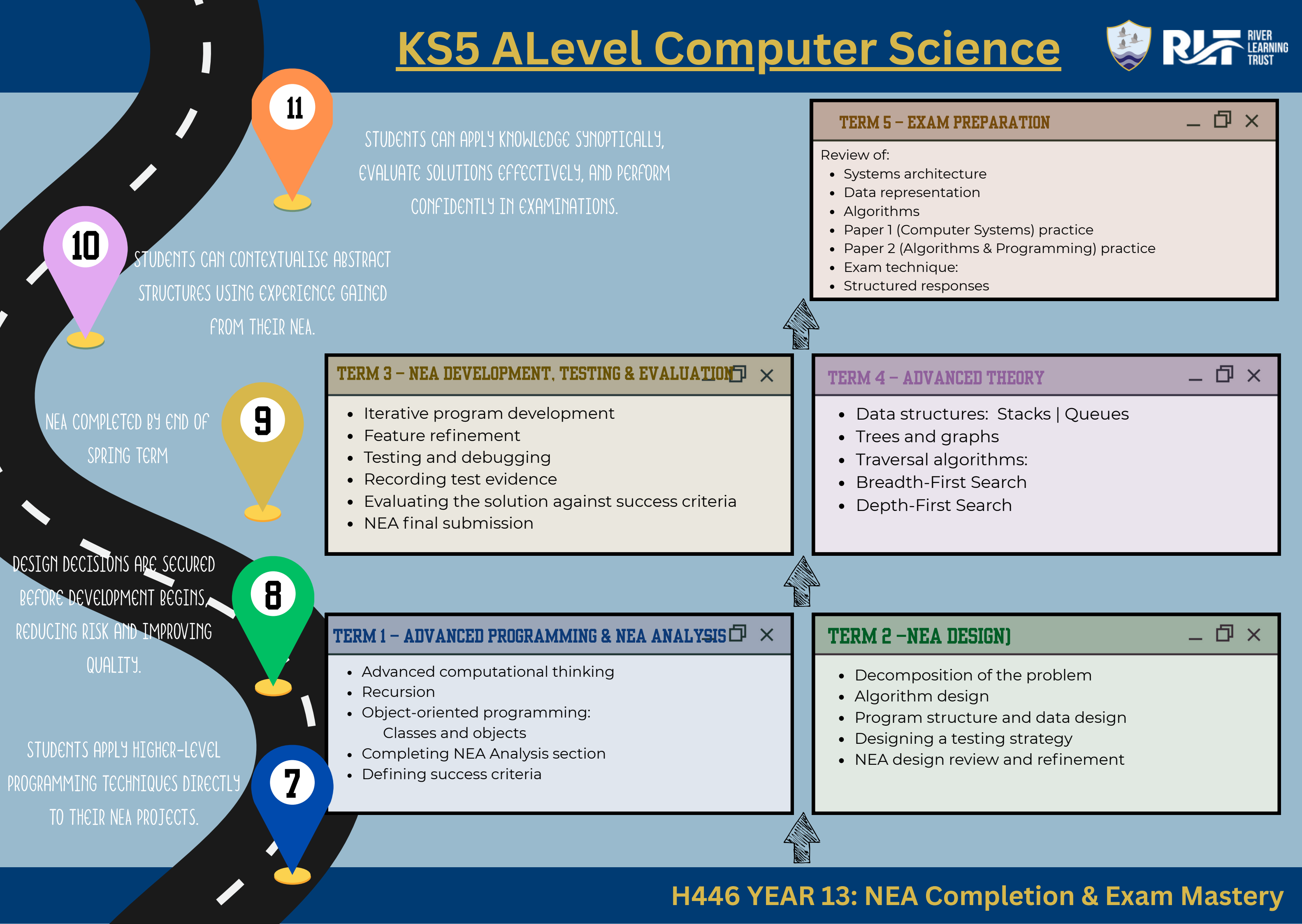


KS5 ALevel Computer Science



STUDENTS ARE CONFIDENT PROGRAMMERS WITH SECURE THEORETICAL KNOWLEDGE AND ARE READY TO UNDERTAKE THE NEA.

6

5

ETHICAL EVALUATION IS MORE MEANINGFUL ONCE STUDENTS UNDERSTAND HOW SYSTEMS OPERATE.

4

ALGORITHMS ARE INTRODUCED ONCE STUDENTS CAN ALREADY PROGRAM AND UNDERSTAND DATA REPRESENTATION.

3

STUDENTS NEED TO UNDERSTAND HOW DATA IS STORED AND TRANSMITTED BEFORE ANALYSING ALGORITHMS AND EFFICIENCY.

2

UNDERSTANDING HOW HARDWARE WORKS SUPPORTS LATER LEARNING IN DATA REPRESENTATION AND PERFORMANCE ANALYSIS.

1

STUDENTS MUST BECOME CONFIDENT PROGRAMMERS EARLY SO LATER TOPICS (ALGORITHMS, DATA STRUCTURES, NEA) ARE ACCESSIBLE.

KS5 ALevel Computer Science

TERM 5 – PROGRAMMING DEPTH & ETHICS

- File handling
- Validation and sanitisation
- Testing strategies
- Social, moral, ethical and legal issues:
- Data protection
- Computer misuse
- Impact of technology on society

TERM 6 – NEA PREPARATION

- Introduction to the NEA
- Understanding NEA requirements
- Identifying suitable problems
- Stakeholders and user needs
- Research into existing solutions
- Begin NEA analysis

TERM 3 – DATA REPRESENTATION & NETWORKS

- Number systems: Binary and hexadecimal
- Data representation: Characters (ASCII, Unicode), Images (bitmaps, file size calculations), Sound
- Networks:
 - Network types (LAN, WAN)
 - Topologies
 - Basic network concepts

TERM 4 – ALGORITHMS & EFFICIENCY

- Algorithm design and tracing
- Searching algorithms: Linear search | Binary search
- Sorting algorithms: Bubble sort | Insertion sort
- Algorithm efficiency: Big-O notation

TERM 1 – PROGRAMMING & COMPUTATIONAL THINKINGS

- Computational thinking: Abstraction | Decomposition
- Programming fundamentals:
 - Variables & data types
 - Input/output
 - Selection (if / else)
 - Iteration (for / while loops)
 - Subroutines (procedures & functions)

TERM 2 – SYSTEMS ARCHITECTURE

- CPU structure and components
- Fetch–Decode–Execute cycle
- Factors affecting CPU performance
- Memory:
 - RAM, ROM, cache
- Secondary storage and compression