1. Creative Development

Weeks 1–5

创造性开发

They should be able to

1. Explain how computing innovations are improved through collaboration. [Skill 1.C]
2. Explain how computing innovations are developed by groups of people. [Skill 1.C]
3. Demonstrate effective interpersonal skills during collaboration. [Skill 1.C]
4. Describe the purpose of a computing innovation. [Skill 1.A]
5. Explain how a program or code segment functions. [Skill 4.A]
6. Identify input(s) to a program. [Skill 3.A]
7. Identify output(s) produced by a program. [Skill 3.A]
8. Develop a program using a development process. [Skill 1.B]
9. Design a program and its user interface. [Skill 1.B]
10. Describe the purpose of a code segment or program by writing documentation. [Skill 4.A]
11. Acknowledge code segments used from other sources. [Skill 1.C]
12. For errors in an algorithm or program:
13. Identify inputs and corresponding expected outputs or behaviors that can be used to check the correctness of an algorithm or program. [Skill 4.C]

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 01 (10 questions, answers on sheet 2)	
Teach the new content	Handout 01 Slide deck 01 Vocabulary list 01	
Practice guided then independent	Exercise sheets 1.1, 1.2, 1.3, 1.4 Past-paper sheets 1.2, 1.3, 1.4	
Check before they leave	Unit test 1 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

2. Data

Weeks 6–10

数据

They should be able to

1. Explain how data can be represented using bits. [Skill 3.C]
2. Explain the consequences of using bits to represent data. [Skill 1.D]
3. For binary numbers:
4. Compare data compression algorithms to determine which is best in a particular context. [Skill 1.D]
5. Describe what information can be extracted from data. [Skill 5.B]
6. Describe what information can be extracted from metadata. [Skill 5.B]
7. Identify the challenges associated with processing data. [Skill 5.D]
8. Extract information from data using a program. [Skill 2.B]
9. Explain how programs can be used to gain insight and knowledge from data. [Skill 5.B]

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 02 (10 questions, answers on sheet 2)	
Teach the new content	Handout 02 Slide deck 02 Vocabulary list 02	
Practice guided then independent	Exercise sheets 2.1, 2.2, 2.3, 2.4	
Check before they leave	*nothing in the Library for this stage yet*	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

3. Algorithms and Programming

Weeks 11–20

算法与编程

They should be able to

1. Represent a value with a variable. [Skill 3.A]
2. Determine the value of a variable as a result of an assignment. [Skill 4.B]
3. Represent a list or string using a variable. [Skill 3.A]
4. For data abstraction:
5. Express an algorithm that uses sequencing without using a programming language. [Skill 2.A]
6. Represent a step-by-step algorithmic process using sequential code statements. [Skill 2.B]
7. Evaluate expressions that use arithmetic operators. [Skill 4.B]
8. Evaluate expressions that manipulate strings. [Skill 4.B]
9. For relationships between two variables, expressions, or values:
10. For relationships between Boolean values:
11. Express an algorithm that uses selection without using a programming language. [Skill 2.A]
12. For selection:
13. For nested selection:
14. Express an algorithm that uses iteration without using a programming language. [Skill 2.A]
15. For iteration:
16. Compare multiple algorithms to determine if they yield the same side effect or result. [Skill 1.D]
17. For algorithms:
18. For list operations:
19. For algorithms involving elements of a list:
20. For binary search algorithms:
21. For procedure calls:
22. Explain how the use of procedural abstraction manages complexity in a program. [Skill 3.C]
23. Develop procedural abstractions to manage complexity in a program by writing procedures. [Skill 3.B]
24. Select appropriate libraries or existing code segments to use in creating new programs. [Skill 2.B]
25. For generating random values:
26. For simulations:
27. For determining the efficiency of an algorithm:
28. Explain the existence of undecidable problems in computer science. [Skill 1.A]

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 03 (10 questions, answers on sheet 2)	
Teach the new content	Handout 03 Slide deck 03 Vocabulary list 03	

Stage	Use	Your notes
Practice guided then independent	Exercise sheets 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9, 3.10, 3.11, 3.12, 3.13, 3.14, 3.15, 3.16, 3.17, 3.18 Past-paper sheets 3.2, 3.5, 3.6, 3.8, 3.9, 3.10, 3.12, 3.13	
Check before they leave	Unit test 3 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

4. Computer Systems and Networks

Weeks 21–24

计算机系统与网络

They should be able to

1. Explain how computing devices work together in a network. [Skill 5.A]
2. Explain how the Internet works. [Skill 5.A]
3. Explain how data are sent through the Internet via packets. [Skill 5.A]
4. Describe the differences between the Internet and the World Wide Web. [Skill 5.A]
5. For fault-tolerant systems, like the Internet:
6. For sequential, parallel, and distributed computing:
7. Describe benefits and challenges of parallel and distributed computing. [Skill 1.D]

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 04 (10 questions, answers on sheet 2)	
Teach the new content	Handout 04 Slide deck 04 Vocabulary list 04	
Practice guided then independent	Exercise sheets 4.1, 4.2, 4.3	
Check before they leave	*nothing in the Library for this stage yet*	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

5. Impact of Computing

Weeks 25–30

计算的影响

They should be able to

1. Explain how an effect of a computing innovation can be both beneficial and harmful. [Skill 5.C]
2. Explain how a computing innovation can have an impact beyond its intended purpose. [Skill 5.C]
3. Describe issues that contribute to the digital divide. [Skill 5.C]
4. Explain how bias exists in computing innovations. [Skill 5.E]
5. Explain how people participate in problem-solving processes at scale. [Skill 1.C]
6. Explain how the use of computing can raise legal and ethical concerns. [Skill 5.E]
7. Describe the risks to privacy from collecting and storing personal data on a computer system. [Skill 5.D]
8. Explain how computing resources can be protected and can be misused. [Skill 5.E]
9. Explain how unauthorized access to computing resources is gained. [Skill 5.E]

Stage	Use	Your notes
Starter 10 min · retrieval practice	Topic quiz 05 (10 questions, answers on sheet 2)	
Teach the new content	Handout 05 Slide deck 05 Vocabulary list 05	
Practice guided then independent	Exercise sheets 5.1, 5.2, 5.3, 5.4, 5.5, 5.6	
Check before they leave	*nothing in the Library for this stage yet*	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	