1. Using Objects and Methods

Weeks 1–6

使用对象与方法

They should be able to

1. Represent patterns and algorithms found in everyday life using written language or diagrams.
2. Explain the code compilation and execution process.
3. Identify types of programming errors.
4. Identify the most appropriate data type category for a particular specification.
5. Develop code to declare variables to store numbers and Boolean values.
6. Develop code to generate output and determine the result that would be displayed.
7. Develop code to utilize string literals and determine the result of using string literals.
8. Develop code for arithmetic expressions and determine the result of these expressions.
9. Develop code for assignment statements with expressions and determine the value that is stored in the variable as a result of these statements.
10. Develop code to read input.
11. Develop code to cast primitive values to different primitive types in arithmetic expressions and determine the value that is produced as a result.
12. Describe conditions when an integer expression evaluates to a value out of range.
13. Describe conditions that limit accuracy of expressions.
14. Develop code for assignment statements with compound assignment operators and determine the value that is stored in the variable as a result.
15. Identify the attributes and behaviors of a class found in the libraries contained in an API.
16. Describe the functionality and use of code through comments.
17. Identify the correct method to call based on documentation and method signatures.
18. Describe how to call methods.
19. Develop code to call class methods and determine the result of those calls.
20. Develop code to write expressions that incorporate calls to built-in mathematical libraries and determine the value that is produced as a result.
21. Explain the relationship between a class and an object.
22. Develop code to declare variables to store reference types.
23. Identify, using its signature, the correct constructor being called.
24. Develop code to declare variables of the correct types to hold object references.
25. Develop code to create an object by calling a constructor.
26. Develop code to call instance methods and determine the result of these calls.
27. Develop code to create string objects and determine the result of creating and combining strings.
28. Develop code to call methods on string objects and determine the result of calling these methods.

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	

Stage	Use	Your notes
Practice guided then independent	Exercise sheets 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 1.8, 1.9, 1.10, 1.11, 1.12, 1.13, 1.14, 1.15 Past-paper sheets 1.3, 1.14, 1.15	
Check before they leave	Unit test 1 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

2. Selection and Iteration

Weeks 7–11

选择与迭代

They should be able to

1. Represent patterns and algorithms that involve selection and repetition found in everyday life using written language or diagrams.
2. Develop code to create Boolean expressions with relational operators and determine the result of these expressions.
3. Develop code to represent branching logical processes by using selection statements and determine the result of these processes.
4. Develop code to represent nested branching logical processes and determine the result of these processes.
5. Develop code to represent compound Boolean expressions and determine the result of these expressions.
6. Compare equivalent Boolean expressions.
7. Develop code to compare object references using Boolean expressions and determine the result of these expressions.
8. Identify when an iterative process is required to achieve a desired result.
9. Develop code to represent iterative processes using ‘while‘ loops and determine the result of these processes.
10. Develop code to represent iterative processes using ‘for‘ loops and determine the result of these processes.
11. Develop code for standard and original algorithms (without data structures) and determine the result of these algorithms.
12. Develop code for standard and original algorithms that involve strings and determine the result of these algorithms.
13. Develop code to represent nested iterative processes and determine the result of these processes.
14. Calculate statement execution counts and informal run-time comparison of iterative statements.

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, 2.5, 2.6, 2.7, 2.8, 2.9, 2.10, 2.11, 2.12 Past-paper sheets 2.1, 2.2, 2.3, 2.7, 2.8, 2.9, 2.10, 2.11	
Check before they leave	Unit test 2 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

3. Class Creation

Weeks 12–17

类的创建

They should be able to

1. Represent the design of a program by using natural language or creating diagrams that indicate the classes in the program and the data and procedural abstractions found in each class by including all attributes and behaviors.
2. Explain the social and ethical implications of computing systems.
3. Develop code to designate access and visibility constraints to classes, data, constructors, and methods.
4. Develop code to declare instance variables for the attributes to be initialized in the body of the constructors of a class.
5. Develop code to define behaviors of an object through methods written in a class using primitive values and determine the result of calling these methods.
6. Develop code to define behaviors of an object through methods written in a class using object references and determine the result of calling these methods.
7. Develop code to define behaviors of a class through class methods.
8. Develop code to declare the class variables that belong to the class.
9. Explain where variables can be used in the code.
10. Develop code for expressions that are self-referencing and determine the result of these expressions.

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	
Practice guided then independent	Exercise sheets 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 3.9 Past-paper sheets 3.1, 3.3, 3.4, 3.5, 3.6, 3.7	
Check before they leave	Unit test 3 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	

4. Data Collections

Weeks 18–30

数据集合

They should be able to

1. Explain the risks to privacy from collecting and storing personal data on computer systems.
2. Explain the importance of recognizing data quality and potential issues when using a data set.
3. Identify an appropriate data set to use in order to solve a problem or answer a specific question.
4. Represent patterns and algorithms that involve data sets found in everyday life using written language or diagrams.
5. Develop code used to represent collections of related data using one-dimensional (1D) array objects.
6. Develop code used to traverse the elements in a 1D array and determine the result of these traversals.
7. Develop code for standard and original algorithms for a particular context or specification that involves arrays and determine the result of these algorithms.
8. Develop code to read data from a text file.
9. Develop code to use ‘Integer‘ and ‘Double‘ objects from their primitive counterparts and determine the result of using these objects.
10. Develop code for collections of related objects using ‘ArrayList‘ objects and determine the result of calling methods on these objects.
11. Develop code used to traverse the elements of an ‘ArrayList‘ and determine the results of these traversals.
12. Develop code for standard and original algorithms for a particular context or specification that involve ‘ArrayList‘ objects and determine the result of these algorithms.
13. Develop code used to represent collections of related data using two-dimensional (2D) array objects.
14. Develop code used to traverse the elements in a 2D array and determine the result of these traversals.
15. Develop code for standard and original algorithms for a particular context or specification that involves 2D arrays and determine the result of these algorithms.
16. Develop code used for linear search algorithms to search for specific information in a collection and determine the results of executing a search.
17. Determine the result of executing each step of sorting algorithms to sort the elements of a collection.
18. Determine the result of calling recursive methods.
19. Determine the result of executing recursive algorithms that use strings or collections.
20. Determine the result of each iteration of a binary search algorithm used to search for information in a collection.
21. Determine the result of each iteration of the merge sort algorithm when used to sort a collection.

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, 4.4, 4.5, 4.6, 4.7, 4.8, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14, 4.15, 4.16, 4.17 Past-paper sheets 4.4, 4.5, 4.9, 4.10, 4.11, 4.12, 4.13, 4.14	

Stage	Use	Your notes
Check before they leave	Unit test 4 (with mark scheme)	
Homework set from the Library	Any unused exercise sheet above Holiday homework pack	