

2.1 Algorithms with Selection and Repetition

Name: _____ Class: _____ Date: _____

Total: 9 marks

Objective

Build the skills to answer exam questions on **algorithms with selection and repetition**.

You must be able to:

- express an algorithm using **sequencing** 顺序, **selection** 选择, and **repetition** 重复
- explain how selection lets an algorithm make choices
- explain how repetition lets an algorithm repeat steps

1 Worked examples

Study these first. Each one shows the method for a question type used later.

■ Three building blocks

Every algorithm is built from:

- **Sequencing** —running steps in order.
- **Selection** —choosing between paths (an **if** statement).
- **Repetition** —repeating steps (a loop).

■ Example

”For each score, if it is above 50, print it” uses **repetition** (for each) plus **selection** (if above 50).

2 Practice

2.1 Name the three building blocks of an algorithm.

[2]

2.2 State what selection lets an algorithm do.

[1]

2.3 State what repetition lets an algorithm do. [1]

3 Exam-style questions

3.1 Choosing between paths in an algorithm is [1]

- **A** sequencing
 - **B** selection
 - **C** repetition
 - **D** casting
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3.2 Repeating a block of steps is [1]

- **A** sequencing
 - **B** selection
 - **C** repetition
 - **D** overloading
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3.3 An algorithm checks each of 10 scores and prints those above 50.

(a) Name the building block that repeats the check. [1]

(b) Name the building block that decides "above 50". [1]

(c) Name the building block that runs steps in order. [1]

4 Go further

- work through the **2.1 Algorithms with Selection and Repetition** lesson on the **Learn** page;
- read the **Boolean Expressions and if Statements** section of the AP Computer Science A handout on the **Know** page.

Solutions

2.1 sequencing, selection, repetition.

2.2 it lets the algorithm choose between different paths based on a condition.

2.3 it lets the algorithm repeat a block of steps.

3.1 B.

3.2 C.

3.3 (a) repetition. (b) selection. (c) sequencing.