

6.1 Automated systems

Name: _____ Class: _____ Date: _____

Total: 7 marks

Objective

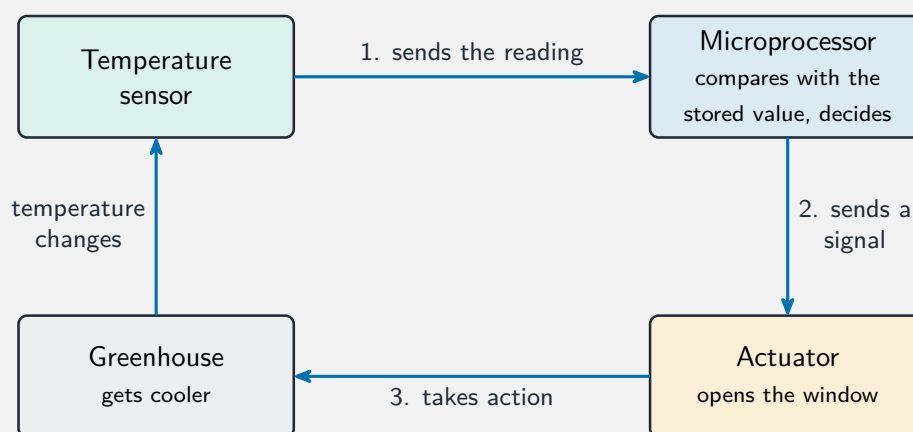
Build the skills to answer exam questions on **automated systems** 自动化系统—the roles of **sensors** 传感器, **microprocessors** 微处理器 and **actuators** 执行器, and the pros and cons.

You must be able to:

- describe the role of the sensor, microprocessor and actuator
- describe the control loop
- give advantages and disadvantages of automated systems

1 Worked examples

■ The control loop



Sensor reads data → microprocessor compares with stored values → signals actuator → the loop repeats

- **sensor:** measures a quantity; **microprocessor:** decides; **actuator:** causes action.

2 Practice

2.1 State the role of a sensor in an automated system. [1]

2.2 State the role of an actuator. [1]

3 Exam-style questions

3.1 In an automated greenhouse, the part that decides whether to open a window is the: [1]

- **A** sensor
 - **B** microprocessor
 - **C** actuator
 - **D** window
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3.2 A greenhouse is too hot.

(a) Describe the steps the system takes to cool it. [3]

(b) State one disadvantage of automated systems. [1]

4 Go further

You are now ready for the real exam questions on this subtopic. Open the **6.1 Automated systems** past-paper sheet in the Library, or try these in **Practice mode**:

- 0478/13 N25 —Q1 (automated systems)
- 0478/13 J25 —Q6 (sensors / control)

Solutions

2.1 it measures a physical quantity and sends the data.

2.2 it receives a signal and causes movement or action.

3.1 B. The microprocessor compares the data and decides.

3.2 (a) the temperature sensor sends the reading to the microprocessor; the microprocessor compares it with the stored value; it signals an actuator to open a window.

(b) any of: high cost; can break down; may replace jobs; cannot react to unplanned situations.