

4.2 The Scientific Revolution

Name: _____ Class: _____ Date: _____ **Total: 11 marks**

KEY WORDS scientific revolution 科学革命

Objective

Build the skills to explain the **Scientific Revolution** 科学革命.

You must be able to:

- state what changed about how nature was investigated
- explain the role of observation, experiment and mathematics
- describe the conflict with established authority
- state what did not change

1 Worked examples

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

■ What changed

Authority for a claim about nature shifted from inherited texts to reproducible observation and mathematical demonstration. The change is in the standard of proof, not only in the conclusions.

■ Method

Controlled observation isolates a factor; experiment produces the conditions rather than waiting for them; mathematics states the regularity and permits prediction. All three together make a claim testable by others.

■ Conflict with authority

Where a finding contradicted an established reading of scripture or of Aristotle, the question became who decides. Institutional authorities and investigators both understood this, which is why some findings were contested far beyond their content.

■ What did not change

Most investigators remained religious and saw their work as describing an ordered creation. The revolution was in method and authority, not in belief.

2 Practice

2.1 State what changed about the standard of proof. [2]

2.2 Explain what experiment adds to observation. [2]

2.3 A finding contradicts an established reading of an ancient authority.

(a) State the underlying question at issue. [1]

(b) State why the dispute exceeded the finding's content. [1]

3 Exam-style questions

3.1 Mathematics contributed to natural philosophy by [1]

- **A** replacing observation
- **B** stating regularities and permitting prediction
- **C** ending experiment
- **D** confirming texts

3.2 Most investigators of the period were [1]

- **A** opposed to religion
- **B** religious, seeing their work as describing an ordered creation
- **C** indifferent to method
- **D** classical scholars only

3.3 A claim is accepted after it is reproduced by others.

(a) State the standard being applied.

[1]

(b) Explain how it differs from the older standard.

[2]

Solutions

2.1 authority shifted from inherited texts to reproducible observation and mathematical demonstration.

2.2 experiment produces the conditions rather than waiting for them, so a factor can be isolated and varied deliberately.

2.3 (a) who decides what is true about nature. (b) the answer determines authority over all future findings, not only this one.

3.1 B. regularity and prediction are what mathematics supplies.

3.2 B. method changed; belief largely did not.

3.3 (a) reproducibility by independent investigators. (b) the older standard rested on the authority of a text or its interpreter, which no amount of independent observation could override.