# 1.3 Areas of knowledge: the natural and human sciences

Name: _____ Class: _____ Date: _____ **Total: 30 marks**

**KEY WORDS** natural sciences • human sciences • falsifiability • paradigm shift • provisional • replication

## Objective

Study two **areas of knowledge**: the **natural sciences** and the **human sciences**: how they produce knowledge, why their claims are **provisional**, and the special problems of studying people.

**You must be able to:**

- explain the role of hypothesis, experiment and falsification
- explain why scientific knowledge is provisional
- explain paradigm shifts (Kuhn)
- explain why studying humans is harder than studying objects
- compare the methods of the two areas

## 1 Key knowledge and worked examples

### ■ Natural sciences

Scientists form **hypotheses**, test them with **observation** and **experiment**, and share results for **peer review**. Karl Popper: a scientific claim must be **falsifiable**: some observation could show it is wrong. Thomas Kuhn: science sometimes changes through **paradigm shifts** (e.g. from Newton's physics to Einstein's relativity for very high speeds and strong gravity). So scientific knowledge is **provisional**: the best current explanation, open to change.

### ■ Human sciences

Psychology, economics, sociology and anthropology study people, who **think**, **change** and **react** to being studied. Problems: the **observer effect** (people behave differently when watched); ethics limit experiments; results may depend on culture. The **replication crisis**: in a 2015 project, about 36 % of 100 published psychology results were replicated with statistically significant results.

**Worked comparison.** A chemist can repeat an experiment with identical samples;



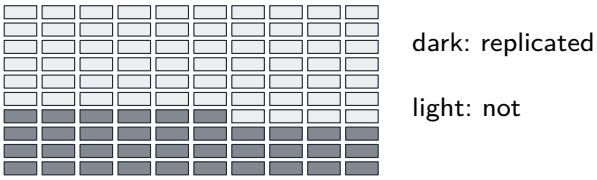
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a psychologist cannot find two identical people. So human sciences rely more on **statistics**, large samples and careful design.

## 2 Practice

**2.1** Explain what Popper meant by **falsifiability**. [2]

**2.2** In a 2015 project, 100 psychology studies were repeated and about 36 gave statistically significant results again. Calculate the percentage that did **not**, and explain what this suggests about knowledge in the human sciences. [3]




**2.3** Explain Kuhn's idea of a **paradigm shift**, with an example. [4]



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**2.4** Compare the methods of the natural and human sciences, and evaluate whether the human sciences are "less scientific". [6]

## 3 Exam-style questions

**3.1** *(Essay-style.)* "In the natural sciences, the aim is certainty; in the human sciences, the aim is understanding." Discuss. [10]






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**3.2** Explain **two** ethical limits on producing knowledge in the human sciences. [5]



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