1.2 Optional themes: knowledge and technology, knowledge and language

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

KEY WORDS knowledge and technology • knowledge and language • algorithm • loaded language • translation

Objective

Study two **optional themes**: **knowledge and technology** (how technology changes what and how we know) and **knowledge and language** (how language shapes and limits knowledge).

You must be able to:

- explain how technology extends and changes knowing
- evaluate trust in algorithms and AI as sources of knowledge
- explain how language shapes thought and classification
- explain how translation can change knowledge
- use real-life examples for each theme

1 Key knowledge and worked examples

■ Knowledge and technology

Technology **extends** our senses (telescopes, microscopes), **stores** knowledge (libraries, the internet), and increasingly **produces** knowledge claims (search rankings, AI systems). Questions: Can we trust what we cannot check? Who designs the tools? Does easy access to information make us know more, or only *feel* we know more?

Example. In 2020 the AI system AlphaFold predicted protein structures with accuracy close to laboratory methods. It is useful, but scientists cannot always see *why* a prediction is right: knowledge without full explanation.

■ Knowledge and language

Language gives us **categories**: words divide the world (colours, kinship). The **Sapir–Whorf hypothesis**: language influences how we think (strong forms are rejected by most linguists; weak forms have some support, e.g. studies of colour discrimination). **Loaded language** frames knowledge: "freedom fighter" or "terrorist". **Translation** can lose or change meaning.

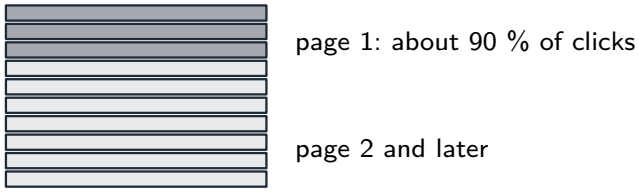
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> **Worked example.** Russian has separate basic words for light blue (*goluboy*) and dark blue (*siniy*). In a 2007 study, Russian speakers were faster at telling apart two blues that fall across this boundary, which suggests language can affect perception slightly.

2 Practice

2.1 Explain how technology can **extend** human knowledge, with **one** example. [2]

2.2 A search engine shows 10 results on the first page; a study finds about 90 % of clicks go to the first page. Explain what this means for **who decides** what we know, and suggest **one** safeguard. [3]



2.3 Explain the **Sapir–Whorf hypothesis**, and the difference between its strong and weak forms. [4]

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2.4 Evaluate the claim that knowledge produced by AI is less trustworthy than knowledge produced by humans. [6]

3 Exam-style questions

3.1 *(Essay-style.)* "Language does not just describe knowledge; it shapes it." Discuss with reference to **one** optional theme and **one** area of knowledge. [10]



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3.2 Explain how **loaded language** can affect knowledge in news reports, with an example. [5]

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Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

technology lets us observe or calculate beyond the limits of human senses or minds; e.g. telescopes reveal distant galaxies / microscopes show cells / computers model climate

2.2

most people see only what the ranking algorithm puts first; so the designers of the algorithm and commercial interests shape knowledge for millions; safeguard, e.g. checking several sources; comparing search engines; transparency about ranking

2.3

the idea that the language we speak influences how we think; strong form: language determines thought; we cannot think what our language cannot say; weak form: language influences perception and memory in some ways; evidence: most linguists reject the strong form; some studies (e.g. Russian blues) support a weak form

2.4

for: AI can produce confident errors and is often not explainable; bias from training data; against: AI can match or beat experts in some tasks, e.g. AlphaFold; humans also have biases and errors; trust depends on testing and track record, not on who produced the claim; a reasoned judgement

3.1

Mark with the TOK markbands (out of 10): [9-10] excellent: clear, focused, convincing links, well-chosen examples, implications explored; [7-8] good: focused, mostly clear links, relevant examples; [5-6] satisfactory: some focus, links partly explained; [3-4] basic: limited links, description more than analysis; [1-2] rudimentary. Points that may be included: clear understanding of the claim; example from language: categories, framing, translation; example from an area of knowledge, e.g. scientific terms, historical labels ("discovery" of America); counter-claim: reality constrains language; translation is possible; evaluation of the counter-claim; implications for how we know

3.2

loaded language carries emotional or evaluative meaning; example pair, e.g. "freedom fighter" / "terrorist", "protest" / "riot"; it shapes how readers judge events before they see evidence; it reflects the perspective of the writer; readers can compare reports to notice it