Exercise walk-through

1.2 Computers, networks and the internet

International Baccalaureate · IB Diploma · Digital Society · SL

Figure: Focusing an inquiry



Did the 2020 grading formula move the power to decide a grade from teachers to the formula's designers?

failure modes:

- ✗ concept only — no case
- ✗ case only — no concept
- ✗ context dump — no digital system

- All four parts at once make a question worth asking; drop one and the inquiry fails.
- Match each part of the diagram to the text.

Answering Paper 1

- **Context**: political (or social).
- Example: the Cambridge Analytica case: a quiz app collected data about its users' friends, who never agreed.
- Concern: young people share likes and friend lists freely; they may not know that the data can be moved and used to target them.
- Link: data collected for one purpose was used for another (data, 3.1), which is a question of power and of **values and ethics**.

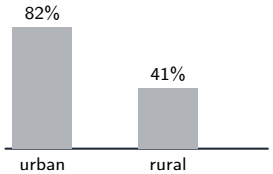
Sources for this lesson

- International Baccalaureate, *Digital Society guide* (first assessment 2024) and subject brief.
- Ofqual, *Awarding GCSE, AS, A level, advanced extension awards and extended project qualifications in summer 2020: interim report* (August 2020).
- US Federal Trade Commission, settlement with Facebook (July 2019); UK Information Commissioner's Office, *Investigation into the use of data analytics in political campaigns* (2018).
- J. Dastin, "Amazon scraps secret AI recruiting tool that showed bias against women", Reuters (10 October 2018).

Exercises 2.1·2.2

2.1 Distinguish the **internet** from the **World Wide Web**. [2]

2.2 In a country of 50 million people, 82 % of urban residents and 41 % of rural residents use the internet. 60 % of the people live in cities. Calculate the number of people offline, and explain **one** cause of the gap. [3]



Exercises 2.1·2.2

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2.1

the internet is the global network of networks: the cables, routers and rules that carry data; the Web is one service on the internet: linked pages viewed in a browser

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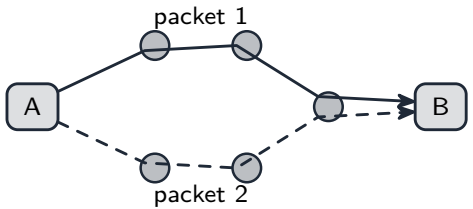
2.2

urban: 30 million $\times 0.18 = 5.4$ million; rural: 20 million $\times 0.59 = 11.8$ million; total offline $=$ **17.2** million; a cause, e.g. fewer masts and cables in rural areas, because they are less profitable for companies / lower incomes / fewer digital skills

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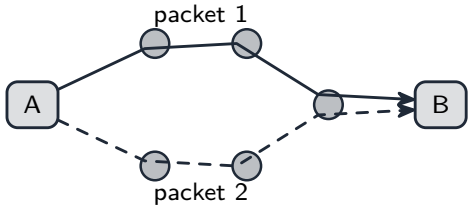
Exercise 2.3

2.3 Explain how a message is sent across the internet in **packets**, and **one** advantage of this method. [4]



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the message is split into small packets, each with the destination address and a number; routers send each packet along a path, which can differ between packets; at the destination the packets are put back in order; advantage, e.g. if one route fails or is busy, packets take another route, so the network is robust

Exercise 2.4

2.4 Evaluate the use of **cloud computing** by a school to store students' work and records. [6]

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benefits: access from any device, at home and school; automatic backup protects against lost devices; lower cost of local servers; concerns: privacy: student data held by a company, possibly in another country; dependence on the internet and on one provider; a judgement, e.g. beneficial if the school chooses a provider with strong data protection and keeps control of the data

Exercise 3.1

3.1 *(Paper 1 style.)* "Reducing the digital divide is mainly a question of building infrastructure." Discuss with reference to **one** real-world example. [15]



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3.1

Mark with the markbands: [13-15] clearly focused on the question, accurate and relevant knowledge and real-world examples used as evidence, concepts applied, well-developed critical analysis, different perspectives evaluated, a reasoned conclusion; [10-12] focused, mostly accurate knowledge, analysis with some evaluation; [7-9] some focus, relevant knowledge, mostly narrative or description with limited analysis; [4-6] little focus, limited knowledge, mostly narrative; [1-3] little understanding of the question. Points that may be included: definition of the digital divide; a real-world example in detail, e.g. rural broadband programmes, community internet centres, mobile money in East Africa; for: without cables, masts and electricity there is no access; about 2.6 billion people offline in 2023 (ITU); mobile networks transformed access in many low-income countries; against: affordability: devices and data cost too much for many; skills: people need digital literacy to benefit; relevance: content in local languages and useful services; gender and age gaps remain where infrastructure exists; concepts used, e.g. power, space, values and ethics; conclusion: a judgement, e.g. infrastructure is necessary but not sufficient