Data, algorithms and digital power

IB DP Digital Society Data, algorithms and digital power full package

Data, algorithms and digital power

- explain how the course joins seven concepts, seven **content** areas and seven contexts;
- ask each concept as a question about a real case;
- distinguish data from information, and explain **collection**, **processing**, storage and privacy;

Data, algorithms and digital power (2)

- explain what an algorithm is and why biased data gives biased results;
- write a focused inquiry question and plan a Paper 1 answer.

The course: concepts, content and contexts

- You do not study these 21 items one by one.
- Every inquiry takes one or two from each column and joins them to a real case.

Seven concepts as questions

- A concept is a question you ask about a case:
- Check the conditions before using the result.

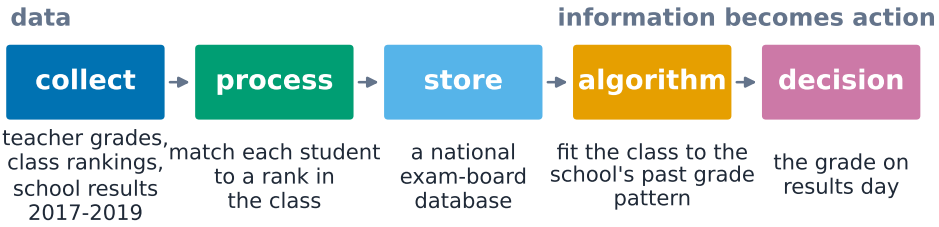
Data

- **Collection** : what is recorded, and what is left out. A ranking records the teacher's order of students, not how hard each one worked during the pandemic.
- **Processing** : cleaning, joining and analysing the data.
- **Storage** : who keeps the data, where and for how long.

Algorithms

- The 2020 grading formula used each school's past results as an input, so students at schools with weaker histories were held down, whatever their own work.
- Amazon tested a computer **system** for choosing job applicants, trained on ten years of CVs, most of them from men. It learned to give lower scores to CVs that included the word "women's" (as in "women's chess club"). Amazon stopped using it (Reuters reported this in 2018).

Figure: Algorithms



- Each stage has makers; bias that enters at the start reaches the decision at the end.
- Match each part of the diagram to the text.

Focusing an inquiry

- **Concept only**: an essay about power in general, with no real case.
- **Case only**: the story of 2020, with no concept to explain it.
- **Context dump**: a lot about schools and politics, but no **digital system** in view.

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:

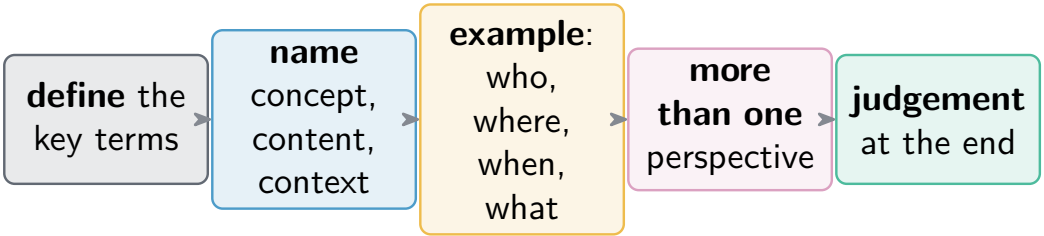
- ✗ concept only — no case
- ✗ case only — no concept
- ✗ context dump — no digital system

- 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**.

Figure: Answering Paper 1



- The shape of a long Paper 1 answer.
- Match each part of the diagram to the text.

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).

Common errors

- Writing about a concept such as power in general, with no real **digital system** or example.
- Telling the story of a case without using a concept to explain it.
- Treating data and information as the same thing; information is data organised so that it means something.

Common errors (2)

- Saying an algorithm is "neutral because it is maths"; it uses the data and rules people chose, so it can repeat past unfairness.
- Giving a vague example ("social media is bad for **privacy**") instead of who, where, when and what happened.
- Ending an "examine" or "evaluate" answer without a judgement.

Key terms

- **Digital system**: a set of connected hardware, software, data and people that works together for a purpose.
- **Concept**: one of seven big ideas (**change**, **expression**, **identity**, power, space, systems, values and ethics) used to ask questions about a case.
- **Data**: raw facts and figures, such as numbers or clicks, before they are organised.

Key terms (2)

- **Information**: data organised so that it means something.
- **Algorithm**: a set of step-by-step rules that turns inputs into outputs.
- **Bias in, bias out**: an algorithm trained on or fed with unfair data repeats that unfairness.
- **Privacy**: a person's right to control information about themselves.

Check yourself

- 1.
- A smartwatch records 72, 75, 140, 138.
- Which part is data, and what would turn it into information? 2.
- Which concept asks "who decides, and who benefits?" Apply it to the 2020 grading formula. 3.