

Reason and argue

Supported ideas, meaningful numbers

01

5 LESSONS + ANSWERS

1. A claim is not an argument
2. Percent or percentage points?
3. Two things that vary together

Before you begin

Five short chapters on building an argument, interpreting percentages, questioning a relationship, preparing a talk and analysing an error. This cross-subject resource uses fictional situations with answers. It is not a complete high-school curriculum or comprehensive exam preparation. Follow your course requirements first and use these activities as additional practice.

03 / 1. A claim is not an argument

04 / 2. Percent or percentage points?

05 / 3. Two things that vary together

06 / 4. Prepare a clear presentation

07 / 5. Learn from an error

Answers on the final page.

1. A claim is not an argument

Saying ‘this proposal is better’ expresses a judgement. To argue for it, identify the criterion and offer something that can be discussed. Better for whom, in which context and compared with what?

A paragraph can follow four steps: an idea, a reason, an example or evidence, and a limitation. Fictional example: opening a study room at lunchtime would give pupils who want it a quiet place. The proposal would, however, require supervision, available space and fair access.

An example illustrates an idea; it does not automatically prove that the idea applies everywhere. Personal experience can be useful, but its scope should remain clear.

Reread your paragraph without phrases such as ‘obviously’ or ‘everyone knows’. If the argument loses all its force, an explanation may be missing. Look for an explicit connection between your reason and the conclusion you support.

YOUR TURN

Write four sentences proposing a book exchange at a school, including one condition needed for it to work.

2. Percent or percentage points?

A proportion rising from 20% to 30% increases by 10 percentage points. Its relative increase is 50%, because $(30 - 20) \div 20 = 0.5$. Both descriptions refer to the same change but use different reference points.

Always identify the starting value and what the percentage represents. Ten pupils out of fifty represent 20%. If the total number changes, comparing counts alone can mislead.

Two successive changes do not always cancel out. A quantity of 100 increased by 10% becomes 110. Reducing that result by 10% gives 99, because the reduction applies to 110.

Before discussing a graph, read its title, axes, units, dates and scope. A shortened axis can make a difference look larger; calculation lets you describe the change without relying only on the visual impression.

YOUR TURN

A proportion rises from 40% to 50%. Calculate the percentage-point difference and the relative percentage increase.

3. Two things that vary together

Observing two things together does not prove that one causes the other. In a fictional example, ice-cream sales and beach attendance both rise during certain weeks. Hot weather might contribute to both changes.

When discussing an explanation, ask whether another factor is involved, whether the time order is known and whether the data support the comparison. Does the observed group resemble the group to which you want to apply the conclusion?

A controlled experiment, where appropriate and properly conducted, can help investigate causation. Each situation has constraints, though; randomly assigning people is not always possible or acceptable.

In your writing, match the strength of your language to the evidence. ‘The variables are associated in these data’ is different from ‘A causes B’. That precision strengthens your reasoning by showing where the evidence stops.

YOUR TURN

Pupils attending an optional workshop obtain better results. Give a possible explanation other than the workshop’s effectiveness.

4. Prepare a clear presentation

A presentation is more than a written text read aloud. Listeners cannot always go back, so they need signposts. Begin with your question and explain the route you will take.

For a short talk, choose two or three ideas that answer the question directly. Attach an example to each. A slide should help explain one point, not contain everything you plan to say. If you show a number, give its source and unit.

Practise with a timer and adjust to the required length. If you run over, do not simply remove the conclusion; first find repetition and secondary details.

Prepare a transition and an honest response to questions you cannot answer. 'I cannot draw that conclusion from the data I have' is better than an invented figure. Clarity includes distinguishing what you know from what still needs checking.

YOUR TURN

Outline a three-minute talk about a reading space: question, two ideas, an example and a conclusion.

5. Learn from an error

A useful correction does more than replace a wrong answer. Find the first step where your reasoning diverges from the expected approach. Does the problem concern a concept, an instruction, a calculation or a missing justification?

Suppose you added percentages applied to different bases. Copying the correct number does not explain the issue. Instead, write: 'I treated two different bases as though they were the same.' Then try a new example with simple numbers.

Keep a short record: error, explanation, corrected example and a checking question. The question should require you to recognise the mechanism, not merely remember the previous result.

Later, attempt a similar exercise without looking at the solution. If the difficulty continues, show the record to someone who can help. It will reveal what you tried and exactly where you became stuck.

YOUR TURN

Correct this claim: 'A 20% rise followed by a 20% fall always returns to the initial value.' Start with 100.

Answers and suggestions

1. One answer: a book exchange could broaden reading discoveries. Participants would bring books they want to pass on. Grouping them by category would make choosing easier. Donation rules and someone responsible for organising the books would be needed.
2. $50 - 40 = 10$ percentage points. $(50 - 40) \div 40 \times 100 =$ a 25% relative increase.
3. Volunteers may already be more motivated or better prepared. This does not prove the workshop is ineffective; it prevents a conclusion from that observation alone.
4. Different outlines work if they answer the question, connect examples to ideas and fit the time.
5. $100 \times 1.20 = 120$; $120 \times 0.80 = 96$. The fall applies to 120, leaving a result 4% below 100.

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