

ICONIC GAMES

YEAR 8

HOMework CLUB

PRINTABLE WORKBOOK

Imagine • Plan • Build • Act

English • Mathematics & Statistics
Science • Social Studies • Technology

36 weeks • 4 terms

Aligned with the New Zealand Curriculum

Name: _____

School: _____

Year: _____

Started: _____

READ · REASON · MAKE · REFLECT

Welcome to your next level

A workbook made to grow with you

This Year 8 book is designed for learners aged about 10–13. It gives you 36 weeks of reading, writing, mathematics and applied thinking across four nine-week terms. You do not need a screen or internet access for the core tasks.

Some questions have one answer. Others ask you to weigh evidence, explain a choice and recognise uncertainty. An honest, well-supported answer matters more than a confident guess.

Your book. Your way.

Write here or in an exercise book. Use a pencil, ruler and eraser. A calculator is useful when a question involves large values; show the method as well as the result. Ask a trusted adult for support when you need it.

PDF and online are different

The printable workbook and online Homework Club are very different learning experiences. Both are designed to support learning aligned with the New Zealand Curriculum. Activities, examples, order and interaction may differ; neither version is a page-for-page copy of the other.

A clear alignment claim

This is an independent supplementary learning resource, not an official Ministry publication, approved textbook or complete curriculum. English and mathematics tasks support Phase 3 (Years 7–8) learning. Science, social studies and technology provide connected contexts; a teacher can adapt them to the school programme.

Safe, fictional cases

Case-study datasets and scenario accounts are fictional or simplified unless clearly identified as historical or scientific explanations. Use fictional people for wellbeing, money and relationships work. Do not share private experiences or identifying information. Laboratory, electrical, hazard and expedition tasks are paper models, not instructions for unsupervised real-world experiments.

THREE SHORT SESSIONS

How to use each week

Session 1 · Read and investigate

Read the passage and teaching note. Read the evidence on the writing page too. Answer the four reading questions, using details rather than guesses.

Session 2 · Write and communicate

Plan a short piece for a clear purpose and audience. Use two or more evidence items. Draft, check and improve the writing.

Session 3 · Maths and application

Study the worked example, then solve the seven maths tasks. Apply the week's ideas on paper and add a small step to your term project.

Suggested weekly time: 60–75 minutes. Split this across days; take longer when useful. A learner may complete fewer maths questions first and return for extension.

Writing space and expectations

Aim for 140–200 words for the main writing task, or an equivalent labelled design, speech script or structured response. Use an exercise book when you need more room. Quality of explanation and revision matters more than word count.

Check without copying

Use the separate answer guide after an honest attempt. Maths answers include methods. Reading and writing guidance accepts different defensible responses. Correct mistakes in another colour and explain what changed.

Support and stretch

Support: read aloud together, explain vocabulary, use a number line, or dictate an initial plan. Stretch: test an alternative, show a second method, or challenge a source's limitation. These options change the support, not the learner's worth.

FOUR TERMS · 36 WEEKS

Your learning map

Term 1 · REALITY CHECK

How do I know what to trust, what influences me, and what choices are actually mine?

Media · identity · digital life · money · relationships

Paper project: THE REALITY PROJECT. Create something that helps other rangatahi navigate information, digital life, money, wellbeing or safety.

Term 2 · POWER & PLACE

How do power, people and place shape the world we live in?

Aotearoa · history · civics · geography · economy

Paper project: OUR PLACE · OUR STORY. Investigate a place, event, movement or community story and turn evidence into an exhibition, documentary, podcast script, paper display.

Term 3 · SYSTEMS UNDER PRESSURE

What happens when a system is pushed — and how can we understand, repair or improve it?

Science · engineering · environment · survival

Paper project: RESILIENT SYSTEMS CHALLENGE. Choose a biological, environmental, physical, engineered or community-infrastructure system; map it, find weak points, model disruption, design an improvement, test, revise and present a more resilient solution.

Term 4 · MAKE YOUR MOVE

What can I create, improve or start — and how do I turn an idea into something real?

Creativity · enterprise · technology · future

Paper project: START SOMETHING. Turn an idea into a tested creation, service, campaign, digital experience, community solution or venture.

Mīharo alongside your learning

Optional companion reading: Mīharo Book Five: Te Māramatanga. The series increases in reading challenge as learners grow. The core workbook tasks stand alone; you do not need the novel to complete them.

ENGLISH TOOLKIT

Read like an investigator

Before reading

Preview the title. Predict a question the text may answer. Notice who is speaking and whether the text is a report, explanation, advertisement or argument.

While reading

Underline a key claim. Circle unfamiliar words. Use context, meaningful word parts or a dictionary. Distinguish what is stated directly from what you infer.

After reading

Summarise the central idea. Compare it with the evidence. Ask whether another source supports it independently or merely repeats it.

Build an explanation

Claim → evidence → reasoning → limitation. Example: “The later caption makes a stronger claim than the original upload. It supplies no new source, so repetition does not establish the cause of the light.”

Write for an audience

Choose a purpose: explain, persuade, report, design or reflect. Plan connected paragraphs. Use precise subject words and link cause, contrast and consequence.

Revise with intent

Check meaning before spelling. Does every claim have support? Have you represented a counterpoint fairly? Then check sentences, punctuation, spelling, vocabulary and paragraph order.

MATHEMATICS & STATISTICS TOOLKIT

Maths methods worth keeping

Percentage change

$(\text{new} - \text{original}) \div \text{original} \times 100$. A fall gives a negative change; describe its size as a percentage decrease.

Fractions and ratios

Use common denominators to add or subtract. Multiply numerators and denominators to multiply. Divide by multiplying by a reciprocal. A ratio compares parts; it is not always a fraction of the whole.

Rates and scale

Unit rate = $\text{amount} \div \text{number of units}$. Distance = $\text{speed} \times \text{time}$. Time = $\text{distance} \div \text{speed}$. Keep units consistent; 30 minutes is 0.5 hours.

Geometry and measurement

Rectangle area = $\text{length} \times \text{width}$. Triangle area = $\frac{1}{2} \times \text{base} \times \text{perpendicular height}$. Cuboid volume = $\text{length} \times \text{width} \times \text{height}$. Triangle angles total 180° .

Statistics and probability

Mean = $\text{total} \div \text{count}$. Median is the middle ordered value. Range = $\text{largest} - \text{smallest}$. Probability = $\text{favourable} \div \text{total equally likely outcomes}$; a model must state its assumptions.

Reasonableness

Estimate first. Show working, units and rounding. Substitute an equation solution back into the original. A graph's scale and a sample's selection affect interpretation.

A LITTLE PROGRESS EACH WEEK

Build a paper project

Your four projects can be a stapled booklet, annotated poster, exhibition labels, written pitch, paper prototype or illustrated system diagram. Simple pencil diagrams are enough; polished artwork is not required.

Week 1: Choose a focused question and audience.

Week 2: Define important terms and evidence criteria.

Week 3: Collect and label useful printed evidence.

Week 4: Make a first outline or model.

Week 5: Add numbers with context and units.

Week 6: Consider a counterpoint and limitation.

Week 7: Test or self-review your draft.

Week 8: Revise and explain the change.

Week 9: Present a qualified conclusion and reflect.

Respect people and place

Do not invent quotations or present fictional data as real research. Acknowledge source perspectives and gaps. Avoid treating Māori, migrants or other communities as a single viewpoint. Do not copy cultural symbols without appropriate context and permission. Use a fictional place when you cannot verify a local claim.

COMPLETION IS A RECORD, NOT A RANKING

Track your progress

Tick R (reading), W (writing), M (maths) and A (application) after an honest attempt. Add a small note about what you want to improve.

Term 1

Week 01 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 02 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 03 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 04 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 05 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 06 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 07 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 08 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 09 R ☐ W ☐ M ☐ A ☐ Next step: _____

Term 2

Week 01 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 02 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 03 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 04 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 05 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 06 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 07 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 08 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 09 R ☐ W ☐ M ☐ A ☐ Next step: _____

Term 3

Week 01 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 02 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 03 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 04 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 05 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 06 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 07 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 08 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 09 R ☐ W ☐ M ☐ A ☐ Next step: _____

Term 4

Week 01 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 02 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 03 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 04 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 05 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 06 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 07 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 08 R ☐ W ☐ M ☐ A ☐ Next step: _____

Week 09 R ☐ W ☐ M ☐ A ☐ Next step: _____

Learner signature: _____
 Support person (optional): _____

TERM 1 • PLAN YOUR INQUIRY

REALITY CHECK

How do I know what to trust, what influences me, and what choices are actually mine?

Create something that helps other rangatahi navigate information, digital life, money, wellbeing or safety.

The nine-week route

1. The Story Behind the Story
2. Feed Engine
3. Persuasion Lab
4. Money Under Pressure
5. Human Systems
6. Consent, Pressure & Power
7. The Newsroom: Context Matters
8. Publish or Pull It?
9. Reality Check: Case Closed

Project question:

Audience and purpose:

What I already know / what I need to find out:

TERM 1 · WEEK 1 · THE STORY BEHIND THE STORY

Read & investigate

Same event, different story

Three reports described the same public event. All used the same initial statement, but one headline implied a cause that the statement did not establish. Another report included the full dataset, which showed that the highlighted result was unusual but not unprecedented. A commentary segment argued that the event reflected a wider problem, while clearly identifying that conclusion as interpretation rather than established fact. Comparing the coverage requires separating shared evidence from framing, emphasis and opinion.

Teaching note

Year 8 Reality Check adds a second layer. Do not only ask “Is this source reliable?” Ask what the source actually contributes, what it leaves out, who created it, when it was created and what evidence it can access. Then compare it with independent sources. Two reports can share the same facts but create different impressions through headlines, images, scale, emphasis or omission. A strong judgement separates established evidence from interpretation and states what remains uncertain.

1. Identify the main claim or problem. Give one detail that helps a reader understand it.

2. Use “Primary statement” and “Commentary clip” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 1 · WEEK 1 · THE STORY BEHIND THE STORY

Maths & reasoning

Worked example

A count rises from 80 to 92. Find the percentage increase.

Increase $\div$ original $\times 100 = 12 \div 80 \times 100 = 15\%$. Answer: 15%

1. A count rises from 80 to 88. Find the percentage increase.

2. A count rises from 140 to 168. Find the percentage increase.

3. Split 75 counters in the ratio 9:6. How many belong in each group?

4. Solve $5x + 3 = 48$. Show how you check x .

5. A rectangle is 13 cm by 7 cm. Find its perimeter and area, with units.

6. A learner gives this answer: “15%” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A count rises from 120 to 138. Find the percentage increase.

7. A value rises from 48 to 66. What is the percentage increase, rounded to the nearest whole percent?

TERM 1 · WEEK 1 · THE STORY BEHIND THE STORY

Apply & reflect

Make thinking visible

Make a three-column evidence audit: CLAIM | WHAT SUPPORTS IT | WHAT LIMITS IT. Include three claims from this week. Mark one claim that needs a more cautious wording. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Choose a focused question and a fictional audience. Record why the question matters.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Optimising one number can change the whole system

A fictional platform changed its recommendation model to give more weight to predicted interest and watch completion. Average viewing time increased, but a small user test reported more repetition. The engineering team argued that the model was successful because it met the engagement target. A safety reviewer replied that a useful feed also needs quality, diversity, privacy and user control. Both statements can be true: a model can achieve the metric it was designed to maximise while still creating costs elsewhere. Auditing the system means checking the formula, the data used, the limits of the testing and the values built into the objective.

Teaching note

A recommendation model can assign different WEIGHTS to signals. For example, $\text{Score} = 2 \times \text{Interest} + \text{Completion} + \text{Share} - 2 \times \text{Repetition}$. Changing a weight changes the output. A system can be accurate at maximising engagement and still create other problems, so an audit asks both “Does the model work as designed?” and “Is the design goal appropriate, safe and fair?”

1. Summarise the passage in two sentences. Keep facts separate from opinion or inference.

2. Use “Model specification” and “Marketing claim” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 1 · WEEK 2 · FEED ENGINE

Maths & reasoning

Worked example

Solve $4x + 4 = 24$. Show how you check x .

Subtract 4, then divide by 4; check $4 \times 5 + 4 = 24$. Answer: $x = 5$.

1. Solve $4x + 3 = 19$. Show how you check x .

2. Solve $7x + 5 = 26$. Show how you check x .

3. Data: 3, 5, 5, 7, 10. Find the mean, median and range.

4. Two angles in a triangle are 50° and 60° . Find the third and explain.

5. Fixed costs are \$108; price is \$11; unit cost is \$6. Find the minimum whole sales to break even.

6. A learner gives this answer: " $x = 10$." to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. Solve $6x + 4 = 64$. Show how you check x .

7. A ranking rule is $\text{Score} = 2I + C + S - 2R$. For a clip, $I=4$, $C=3$, $S=1$ and $R=2$. What is the score?

TERM 1 · WEEK 2 · FEED ENGINE

Apply & reflect

Make thinking visible

Make a three-column evidence audit: CLAIM | WHAT SUPPORTS IT | WHAT LIMITS IT. Include three claims from this week. Mark one claim that needs a more cautious wording. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Define three key terms and decide what counts as convincing evidence.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

When design makes the decision feel smaller

A fictional online store promotes a product through a creator partnership. The sponsorship is labelled, but the checkout also contains a pre-selected add-on and a countdown that resets whenever the page is reopened. A banner says “people like you choose this option”, yet no data source is shown. Designers sometimes use defaults, urgency, social proof and personalised messages because these can increase conversion. An ethical audit asks whether users still receive clear information, genuine choice and an easy way to refuse.

Teaching note

Persuasion tries to influence a choice; manipulation reduces the quality of that choice through deception, hidden information, pressure or obstructive design. Audit PURPOSE → TARGETING → NUDGE → DISCLOSURE → AUTONOMY. Ask what the user can see, what is hidden, what is pre-selected, and whether the evidence matches the claim.

1. Explain a cause-and-effect relationship in the passage. Use a specific detail.

2. Use “Resetting countdown” and ““People like you choose this”” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Write & communicate

Evidence desk · Read these alongside the passage.

Resetting countdown: Testing shows the “10 minutes left” countdown restarts when the page is reopened, so the scarcity cue is not a real deadline.

Pre-selected add-on: A \$12 protection plan is already ticked before the user reaches checkout.

Sponsored post: The creator says the product is gifted and the post carries a visible sponsorship label.

“People like you choose this”: The interface gives no source, sample or definition for the personalised social-proof claim.

Your writing brief

Evaluate the interface. Distinguish legitimate persuasion from manipulation, consider the business counter-argument and recommend specific redesigns.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 1 • WEEK 3 • PERSUASION LAB

Maths & reasoning

Worked example

A \$90 item has 25% off. Calculate the saving and sale price.

Find the percentage of the original price, then subtract the saving. Answer: Saving \$22.50; price \$67.50.

1. A \$60 item has 20% off. Calculate the saving and sale price.

2. A \$70 item has 30% off. Calculate the saving and sale price.

3. Two angles in a triangle are 50° and 40° . Find the third and explain.

4. A stall has fixed costs \$70, unit cost \$6, and price \$11. Find revenue and profit for 20 sales.

5. Data: 3, 5, 5, 7, 10. Find the mean, median and range.

6. A learner gives this answer: “Saving \$22.50; price \$67.50.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A \$90 item has 25% off. Calculate the saving and sale price.

7. A “buy 2, get 1 free” offer applies to three equal-price items. What percentage discount is this compared with paying full price for all three?

TERM 1 · WEEK 3 · PERSUASION LAB

Apply & reflect

Make thinking visible

Make a three-column evidence audit: CLAIM | WHAT SUPPORTS IT | WHAT LIMITS IT. Include three claims from this week. Mark one claim that needs a more cautious wording. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Collect three relevant details from the printed weekly sources; label their origins.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Cheap per month is not the same as cheap overall

A fictional comparison shows three 12-month phone plans. Plan A costs \$180 upfront and \$32 each month. Plan B has no upfront charge and costs \$49 each month. Plan C has no upfront charge, costs \$42 each month and adds a \$96 annual account fee. Plan A has the lowest total cost across the year, but it requires more money at the beginning. Plan B costs more overall, yet it may fit a scenario where the user cannot pay more than \$50 upfront. The most suitable option therefore depends on both total cost and the constraints of the person making the decision.

Teaching note

To compare plans fairly, put them on the same time scale. $\text{TOTAL COST} = \text{upfront cost} + \text{recurring costs} + \text{fees}$. A low monthly number can hide a larger total, while the lowest total may still require an upfront amount someone cannot pay. Good financial reasoning states both the calculation and the constraint.

1. Which detail would you put first in a summary, and why? Explain its importance.

2. Use “Full price schedule” and ““Cheapest plan for everyone”” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 1 • WEEK 4 • MONEY UNDER PRESSURE

Write & communicate

Evidence desk • Read these alongside the passage.

Full price schedule: Plan A lists a \$180 upfront cost and \$32 per month for 12 months, allowing the full annual cost to be calculated.

Monthly headline: Plan B advertises “just \$49 a month” but the headline alone does not compare the full-year total with other plans.

Account fee: Plan C lists \$42 per month plus a \$96 annual account fee. Leaving the fee out would understate the total cost.

“Cheapest plan for everyone”: No single plan can be cheapest and most suitable for every person because affordability constraints differ.

Your writing brief

Compare the payment plans using the supplied costs. Recommend for one fictional user, then explain how an upfront-budget constraint could change the decision.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 1 · WEEK 4 · MONEY UNDER PRESSURE

Maths & reasoning

Worked example

One notebook costs \$1.24. Find the cost of 5, then the change from \$10.

Multiply the unit cost by quantity. Check the decimal place; subtract from \$10. Answer: Cost \$6.20; change \$3.80.

1. One notebook costs \$1.23. Find the cost of 5, then the change from \$10.

2. One notebook costs \$1.40. Find the cost of 5, then the change from \$10.

3. A circle has radius 6 cm. Use $\pi = 3.14$ to find circumference and area.

4. Split 70 counters in the ratio 8:6. How many belong in each group?

5. 12 pages are printed in 3 minutes at a constant rate. Find the rate and time for 36 pages.

6. A learner gives this answer: “Cost \$7.20; change \$2.80.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. One notebook costs \$1.44. Find the cost of 5, then the change from \$10.

7. A monthly cost of \$45 increases by 8%. What is the new monthly cost?

TERM 1 · WEEK 4 · MONEY UNDER PRESSURE

Apply & reflect

Make thinking visible

Make a three-column evidence audit: CLAIM | WHAT SUPPORTS IT | WHAT LIMITS IT. Include three claims from this week. Mark one claim that needs a more cautious wording. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week’s paper project step

Draft a diagram, table or outline. Mark a claim that needs checking.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Systems work together — slogans usually leave that out

A fictional science video correctly explains that oxygen entering the lungs can move into the blood and be transported to cells. It also explains that digested nutrients can enter the bloodstream, where the circulatory system can carry them around the body. The video becomes unreliable when it claims one drink can reset every body system within two days. Body systems interact, but they do not all respond to one input in the same way or on one guaranteed timetable. A better explanation connects a biological mechanism to evidence, separates what is known from what is uncertain and avoids universal promises that the evidence cannot support.

Teaching note

Human body systems are interconnected. The respiratory system exchanges oxygen and carbon dioxide, the circulatory system transports gases and nutrients, the digestive system breaks food into smaller molecules and absorbs nutrients, and the endocrine system sends chemical messages to target tissues. A change in one system can affect others, but that does not mean one simple action can “reset” the whole body. Strong explanations name the mechanism, connect it to evidence, recognise variation between people and avoid universal promises.

1. What is the writer trying to help the reader understand? Support your answer with a detail.

2. Use “Gas exchange model” and “Reset post” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Write & communicate

Evidence desk · Read these alongside the passage.

Gas exchange model: In the lungs, oxygen moves into the blood and carbon dioxide moves from the blood to the air.

Digestion model: Digestion breaks food into smaller molecules; nutrients are absorbed and transported around the body.

Signalling explainer: Chemical messengers can travel through the body and affect target tissues.

Reset post: A fictional creator claims one drink can reset every body system in 48 hours but gives no mechanism or reliable source.

Your writing brief

Evaluate the fictional science message. Explain interacting body systems, challenge an unsupported reset claim and propose an accurate replacement.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

Maths & reasoning

Worked example

Calculate $7/9 \div 1/5$. Give a simplified fraction.

Use a common denominator for addition; divide by multiplying by the reciprocal. Answer: $35/9$

1. Calculate $7/13 \div 3/7$. Give a simplified fraction.

2. Calculate $1/2 \div 3/7$. Give a simplified fraction.

3. A result changes from 35% to 50%. Find the percentage-point change AND relative percentage increase.

4. A rectangle is 14 cm by 4 cm. Find its perimeter and area, with units.

5. Solve $5x + 4 = 19$. Show how you check x.

6. A learner gives this answer: “ $54/11$ ” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. Calculate $9/11 \div 1/6$. Give a simplified fraction.

7. In a fictional gas-exchange model, 18 of 24 oxygen units move into the blood. What proportion is transferred?

TERM 1 · WEEK 5 · HUMAN SYSTEMS

Apply & reflect

Make thinking visible

Make a three-column evidence audit: CLAIM | WHAT SUPPORTS IT | WHAT LIMITS IT. Include three claims from this week. Mark one claim that needs a more cautious wording. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week’s paper project step

Add a numerical comparison and explain its context. Check units and denominators.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

TERM 1 • WEEK 6 • CONSENT, PRESSURE & POWER

Read & investigate

Look at the pattern, not one isolated moment

A single friendly message does not tell you whether a relationship is safe or unsafe. Patterns matter. Repeated boundary-testing, secrecy, isolation, guilt, threats or requests that become more personal over time can reduce genuine choice. A power imbalance can make it harder to refuse even when no direct threat is spoken. Requests for private or intimate images should never rely on pressure or secrecy. A young person can stop responding, keep evidence if it is safe to do so, block or report the account and tell a trusted adult. They do not need to investigate the person themselves.

Teaching note

Consent is an ongoing, freely made choice. It is not valid when someone is being threatened, repeatedly pressured, manipulated or made to fear consequences for saying no. Grooming is a pattern of building trust or access and then using secrecy, isolation, pressure or boundary-testing toward exploitation; ordinary kindness by itself is not grooming. If a request for a private or intimate image feels wrong, a safe response is to stop, not send anything, leave or block the contact, save/report relevant information where appropriate and tell a trusted adult.

1. Explain a contrast or tension in the passage. Refer to both sides.

2. Use “Choice respected” and “Single friendly act” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 1 · WEEK 6 · CONSENT, PRESSURE & POWER

Write & communicate

Evidence desk · Read these alongside the passage.

Choice respected: A fictional friend asks once, accepts “no” immediately and does not punish, guilt or embarrass the other person.

Escalating pattern: Over several weeks, a person moves from compliments to secrecy, isolation and repeated requests after boundaries are stated.

Power imbalance: A person uses popularity, age, status or access to make refusal feel risky or costly.

Single friendly act: One kind message or gift alone does not establish a harmful pattern without additional behaviour or context.

Your writing brief

Analyse the fictional pattern of pressure. Distinguish consent from coercion, avoid inferring intent from a single friendly act and recommend safe support.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 1 • WEEK 6 • CONSENT, PRESSURE & POWER

Maths & reasoning

Worked example

A bag has 8 red and 3 blue tokens. A token is chosen at random. Find $P(\text{red})$ and $P(\text{not red})$.

Count equally likely tokens, not colour names; probabilities add to 1. Answer: $P(\text{red}) = 8/11$; $P(\text{not red}) = 3/11$.

1. A bag has 8 red and 2 blue tokens. A token is chosen at random. Find $P(\text{red})$ and $P(\text{not red})$.

2. A bag has 4 red and 4 blue tokens. A token is chosen at random. Find $P(\text{red})$ and $P(\text{not red})$.

3. One notebook costs \$1.29. Find the cost of 5, then the change from \$10.

4. Convert 3.3 kg to grams, then find the mass of one of 5 equal portions.

5. Convert 6.5 kg to grams, then find the mass of one of 5 equal portions.

6. A learner gives this answer: " $P(\text{red}) = 1/2$; $P(\text{not red}) = 1/2$." to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A bag has 3 red and 3 blue tokens. A token is chosen at random. Find $P(\text{red})$ and $P(\text{not red})$.

7. A fictional safety survey has 80 responses, and 52 learners say they know at least one trusted adult they could contact. What percentage is that?

TERM 1 · WEEK 6 · CONSENT, PRESSURE & POWER

Apply & reflect

Make thinking visible

Make a three-column evidence audit: CLAIM | WHAT SUPPORTS IT | WHAT LIMITS IT. Include three claims from this week. Mark one claim that needs a more cautious wording. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Write a fair counterpoint. Identify a gap or voice the project does not represent.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

True numbers can still be framed badly

The fictional trial increased average weekday boardings from 1,020 to 1,110, which is an increase of 90. One outlet describes that as strong growth. Another focuses on a single day with 640 boardings, but that day occurred during a road closure and is not typical of the rest of the trial. A third graphic uses a vertical axis beginning at 1,000, exaggerating the visual size of the change. None of those choices changes the raw numbers, but each affects the impression a reader receives. Responsible reporting explains the denominator, unusual conditions and uncertainty.

Teaching note

Accuracy is more than using true numbers. A report can still mislead if it hides the denominator, uses a narrow graph scale, treats an outlier as typical or selects only quotes that support one angle. Strong editorial work makes the evidence chain visible: what is known, who supplied the data, what the sample can support and what remains uncertain.

1. Identify one explicit fact and one reasonable inference. Explain the evidence for the inference.

2. Use “Outlet North” and “Graph audit” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Evidence desk · Read these alongside the passage.

Graph audit: A graphic starts its vertical axis at 1,000 rather than zero, making the 90-boarding increase look visually much larger.

Write an editor's note. Explain a framing or graph problem, use a numerical comparison with context, acknowledge limitations and give a balanced conclusion.

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 1 • WEEK 7 • THE NEWSROOM: CONTEXT MATTERS

Maths & reasoning

Worked example

Data: 9, 11, 11, 13, 16. Find the mean, median and range.

Mean = total $\div$ 5; median is the middle ordered value; range = maximum – minimum. Answer: Mean 12; median 11; range 7.

1. Data: 9, 11, 11, 13, 16. Find the mean, median and range.

2. Data: 5, 7, 7, 9, 12. Find the mean, median and range.

3. A bag has 8 red and 2 blue tokens. A token is chosen at random. Find $P(\text{red})$ and $P(\text{not red})$.

4. A count rises from 100 to 120. Find the percentage increase.

5. One notebook costs \$1.34. Find the cost of 5, then the change from \$10.

6. A learner gives this answer: “Mean 7; median 6; range 7.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. Data: 4, 6, 6, 8, 11. Find the mean, median and range.

7. Average weekday boardings rose from 1,020 to 1,110. What is the percentage increase, rounded to one decimal place?

TERM 1 • WEEK 7 • THE NEWSROOM: CONTEXT MATTERS

Apply & reflect

Make thinking visible

Make a three-column evidence audit: CLAIM | WHAT SUPPORTS IT | WHAT LIMITS IT. Include three claims from this week. Mark one claim that needs a more cautious wording. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Make a draft page or paper prototype. Ask someone to comment, or use the checklist yourself.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

TERM 1 • WEEK 8 • PUBLISH OR PULL IT?

Read & investigate

Publishing is a decision, not just a button

The fictional campaign has a genuine result: sign-ups increased from 200 to 230, which is 15%. That result can be communicated accurately. However, the draft graphic uses a narrow vertical axis that exaggerates the visual size of the increase. The photo also contains private information in the background, and the video has no captions. An editor does not need to discard the whole campaign, but they do need to fix problems that could mislead, exclude or expose people.

Teaching note

Having an audience creates responsibility. Editors should ask whether the content is accurate, proportionate, attributed, accessible and respectful of privacy. A true statistic can still be presented misleadingly. A useful image can still expose private information. A strong editorial decision explains both the benefit of publishing and the reason a revision or removal may still be necessary.

1. Suggest a more precise alternative title. Explain how it represents the passage accurately.

2. Use “Campaign data” and “Accessibility issue” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 1 · WEEK 8 · PUBLISH OR PULL IT?

Write & communicate

Evidence desk · Read these alongside the passage.

Campaign data: The fictional campaign increased sign-ups from 200 to 230, a 15% increase.

Graph issue: The draft chart starts its vertical axis at 195, making the 30-person increase look much larger than it is.

Privacy issue: A background noticeboard in the fictional photo shows a student surname and contact detail.

Accessibility issue: The draft video has spoken information but no captions or transcript.

Your writing brief

Make a publish, revise or withdraw decision. Evaluate accuracy, graph scale, privacy and accessibility. Consider the argument for speed before reaching a judgement.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 1 · WEEK 8 · PUBLISH OR PULL IT?

Maths & reasoning

Worked example

A count rises from 80 to 100. Find the percentage increase.

Increase $\div$ original $\times 100 = 20 \div 80 \times 100 = 25\%$. Answer: 25%

1. A count rises from 80 to 96. Find the percentage increase.

2. A count rises from 140 to 182. Find the percentage increase.

3. A map uses 1 cm : 20 km. Two places are 9 cm apart on the map. Find the actual distance.

4. Sequence: 5, 10, 15, 20. Give the next two terms and a rule for term n.

5. A fictional vehicle travels 10 km at a steady 5 km/h. Find the time in hours and minutes.

6. A learner gives this answer: “25%” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A count rises from 120 to 150. Find the percentage increase.

7. Fictional campaign sign-ups rose from 200 to 230. What was the percentage increase?

TERM 1 · WEEK 8 · PUBLISH OR PULL IT?

Apply & reflect

Make thinking visible

Make a three-column evidence audit: CLAIM | WHAT SUPPORTS IT | WHAT LIMITS IT. Include three claims from this week. Mark one claim that needs a more cautious wording. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Revise one choice in response to evidence or feedback. Record before and after.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Several things can be true at once

The fictional programme gained 60 enrolments, rising from 240 to 300, while both a recommendation-system change and a creator campaign began at the same time. The data show growth, but they do not isolate which change caused it. Average delivery cost fell from \$52 to \$46, which is a measurable financial improvement. The optional wellbeing survey looks positive among respondents, but only 48 of 300 participants answered it. A sponsored creator claims the AI system caused the programme to work better for everyone. That causal claim is stronger than the available evidence. A defensible conclusion can recognise growth and lower cost while remaining uncertain about cause and whole-group wellbeing.

Teaching note

Complex decisions often involve several partly true claims. Treat each claim separately, test the mechanism and the numbers, then bring the pieces together. A good final judgement states what is established, what is plausible, what remains uncertain and what evidence would change the conclusion. Counterpoints strengthen reasoning when they are answered rather than ignored.

1. What conclusion does this passage support, and what would go beyond its evidence?

2. Use “Enrolment data” and “Creator claim” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 1 • WEEK 9 • REALITY CHECK: CASE CLOSED

Maths & reasoning

Worked example

A result changes from 25% to 40%. Find the percentage-point change AND relative percentage increase.

$40 - 25 = 15$ points. Relative change = $15 \div 25 \times 100$. These measures answer different questions. Answer: 15 percentage points; 60.0% relative increase.

1. A result changes from 25% to 40%. Find the percentage-point change AND relative percentage increase.

2. A result changes from 40% to 55%. Find the percentage-point change AND relative percentage increase.

3. 12 pages are printed in 4 minutes at a constant rate. Find the rate and time for 36 pages.

4. A map uses 1 cm : 35 km. Two places are 6 cm apart on the map. Find the actual distance.

5. Calculate $3/4 \div 3/13$. Give a simplified fraction.

6. A learner gives this answer: “15 percentage points; 42.9% relative increase.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A result changes from 35% to 50%. Find the percentage-point change AND relative percentage increase.

7. Fictional enrolments rose from 240 to 300. What was the percentage increase?

TERM 1 • WEEK 9 • REALITY CHECK: CASE CLOSED

Apply & reflect

Make thinking visible

Make a three-column evidence audit: CLAIM | WHAT SUPPORTS IT | WHAT LIMITS IT. Include three claims from this week. Mark one claim that needs a more cautious wording. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Finish the paper project and write a qualified conclusion. Reflect on one next step.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

TERM 1 · REVIEW AND PROJECT SHOWCASE

Pause, check, improve

1. Summarise the most important idea from this term in your own words.

2. Choose two weeks. Explain a connection between their evidence or systems.

3. Correct one maths error. Show the original misconception and a reliable method.

4. Present your paper project: central claim, strongest evidence and a limitation.

5. What changed after a counterpoint, test or feedback? Give a specific example.

6. Set one achievable next step. What support or strategy will help?

TERM 2 • PLAN YOUR INQUIRY

POWER & PLACE

How do power, people and place shape the world we live in?

Investigate a place, event, movement or community story and turn evidence into an exhibition, documentary, podcast script, paper display.

The nine-week route

1. Reform Files
2. Empire & Resistance
3. Who Holds Power?
4. Population Shift
5. Money, Tax & Economy
6. Government Lab
7. Hazard Lab
8. People on the Move
9. Power & Place Summit

Project question:

Audience and purpose:

What I already know / what I need to find out:

Read & investigate

Reform for whom?

The Liberal government came to power in 1891 and remained in office until 1912. Reform movements were already active, including the long campaign for women’s suffrage. In 1893 adult women gained the right to vote in parliamentary elections. The Industrial Conciliation and Arbitration Act followed in 1894, and an old-age pension scheme became law in 1898. These changes mattered, but their effects were uneven. The pension had strict conditions and excluded Chinese and other Asian people. Liberal-era land policy also continued pressure on Māori land. Historians therefore examine both the expansion of rights and the limits of reform.

Teaching note

A reform can expand rights or protection and still leave exclusions in place. Historical analysis therefore asks two questions at once: what changed, and for whom? In the 1890s New Zealand saw women gain the parliamentary vote, new industrial-relations law and an old-age pension scheme, while Māori land loss continued and some groups were excluded from parts of the new welfare system. Strong history keeps those developments together rather than turning the period into a simple success story.

1. Identify the main claim or problem. Give one detail that helps a reader understand it.

2. Use “PRIMARY · 1893 suffrage petition” and “SECONDARY · Liberal-era overview” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Write & communicate

Evidence desk • Read these alongside the passage.

PRIMARY • 1893 suffrage petition: Thirteen petitions presented in 1893 carried nearly 32,000 signatures supporting votes for women, after earlier petition campaigns in 1891 and 1892.

PRIMARY • Electoral Act 1893: The 1893 Electoral Act gave adult women the right to vote in parliamentary elections, making New Zealand the first self-governing country to do so.

PRIMARY • Industrial Conciliation and Arbitration Act 1894: The 1894 law recognised unions and created a compulsory conciliation and arbitration system for industrial disputes.

PRIMARY + CONTEXT • Old-age Pensions Act 1898: The pension was means-tested and had strict eligibility rules. Chinese and other Asian people were specifically excluded, showing that a new social protection did not apply equally to everyone.

SECONDARY • Liberal-era overview: The Liberal government held office from 1891 to 1912. Its reforms expanded the role of the state, while land policies also contributed to continuing Māori land loss.

Your writing brief

Evaluate reform in the Liberal era. Explain who gained rights or protection and who might remain excluded. Challenge an “everyone benefited equally” claim.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 2 • WEEK 1 • REFORM FILES

Maths & reasoning

Worked example

A count rises from 120 to 132. Find the percentage increase.

Increase $\div$ original $\times 100 = 12 \div 120 \times 100 = 10\%$. Answer: 10%

1. A count rises from 120 to 156. Find the percentage increase.

2. A count rises from 180 to 207. Find the percentage increase.

3. A count rises from 100 to 125. Find the percentage increase.

4. Fixed costs are \$84; price is \$7; unit cost is \$2. Find the minimum whole sales to break even.

5. Two angles in a triangle are 55° and 65° . Find the third and explain.

6. A learner gives this answer: “10%” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A count rises from 160 to 176. Find the percentage increase.

7. Using rounded petition figures of 19,000 signatures in 1892 and 32,000 in 1893, what was the approximate percentage increase?

TERM 2 • WEEK 1 • REFORM FILES

Apply & reflect

Make thinking visible

Draw a cause → change → consequence chain or a labelled place-and-power map. Include four details from the printed evidence. Mark one missing voice or uncertain link. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Choose a focused question and a fictional audience. Record why the question matters.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Motive is not the same as method

European imperial expansion between about 1750 and 1914 involved trade, strategic rivalry, military power, political control and ideas about empire. India is a useful case study because British control developed over a long period. The East India Company began as a commercial organisation but acquired territory and administrative power through conquest and alliance. A major uprising in 1857 challenged Company rule. The Government of India Act 1858 then transferred governing authority to the British Crown. That change replaced Company government with direct imperial government; it did not end British control. Indian responses were diverse and changed over time, so a strong explanation should distinguish motives, mechanisms, consequences and resistance.

Teaching note

Empires expand through combinations of economic, strategic and political motives, but motives are not the same as the methods used to gain control. In India, the British East India Company grew from a trading company into a territorial and administrative power through conquest and alliance. The 1857 uprising challenged Company rule. In 1858 the British state transferred governing authority from the Company to the Crown. Indian responses to imperial rule varied across regions, communities and time, including armed resistance, negotiation, adaptation and later organised political movements.

1. Summarise the passage in two sentences. Keep facts separate from opinion or inference.

2. Use “MOTIVE · trade and revenue” and “CONSEQUENCE · rule changed, control remained” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Maths & reasoning

Worked example

Temperature starts at -6°C , rises 5°C , then falls 6°C . What is it now?

$-6 + 5 - 6 = -7$. Use a number line if useful. Answer: -7°C .

1. Temperature starts at -6°C , rises 4°C , then falls 4°C . What is it now?

2. Temperature starts at -9°C , rises 6°C , then falls 8°C . What is it now?

3. Temperature starts at -5°C , rises 8°C , then falls 12°C . What is it now?

4. One notebook costs \$1.21. Find the cost of 5, then the change from \$10.

5. A count rises from 100 to 125. Find the percentage increase.

6. A learner gives this answer: “ -9°C .” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. Temperature starts at -8°C , rises 5°C , then falls 6°C . What is it now?

7. The Year 8 imperial-expansion period runs from about 1750 to 1914. How long is that interval?

TERM 2 · WEEK 2 · EMPIRE & RESISTANCE

Apply & reflect

Make thinking visible

Draw a cause → change → consequence chain or a labelled place-and-power map. Include four details from the printed evidence. Mark one missing voice or uncertain link. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Define three key terms and decide what counts as convincing evidence.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Separated functions, real overlap

It is easy to draw three separate boxes labelled Legislature, Executive and Judiciary, but New Zealand’s system is more interesting than that diagram suggests. Parliament makes laws and scrutinises Government. The Executive develops policy and runs the day-to-day work of government. Courts interpret and apply law. At the same time, Ministers in the Executive are also members of Parliament, and a Government stays in office only while it has the confidence of the House. That is a feature of responsible government in the Westminster tradition. A strong civics explanation therefore identifies both the separate functions and the places where institutions connect.

Teaching note

New Zealand distributes public power across three branches. Parliament is the legislative branch and makes laws, represents the public and holds the Government to account. The Executive, or Government, develops policy and administers the law and public services. The Judiciary interprets and applies the law through the courts. New Zealand is a constitutional monarchy and a parliamentary democracy. Its Westminster system has some overlap: Ministers in the Executive must be members of Parliament, and the Government can remain in office only while it has the confidence of the House. Separation of powers therefore means divided functions and checks, not three institutions that never touch.

1. Explain a cause-and-effect relationship in the passage. Use a specific detail.

2. Use “LEGISLATURE · Parliament” and “MMP context” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Evidence desk · Read these alongside the passage.

MMP context: In New Zealand general elections, MMP is designed so party representation in the House broadly reflects each party's share of the party vote, subject to electoral rules. The classroom seat calculation used here is deliberately simplified.

Explain legislative, executive and judicial functions in New Zealand. Describe one overlap between Parliament and Government and one accountability relationship.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 2 · WEEK 3 · WHO HOLDS POWER?

Maths & reasoning

Worked example

Split 55 counters in the ratio 7:4. How many belong in each group?

11 equal parts; each part is 5. Multiply each ratio number by this amount. Answer: 35 and 20.

1. Split 50 counters in the ratio 7:3. How many belong in each group?

2. Split 40 counters in the ratio 3:5. How many belong in each group?

3. A rectangle is 11 cm by 4 cm. Find its perimeter and area, with units.

4. A triangle has base 18 cm and perpendicular height 7 cm. Find its area.

5. A triangle has base 10 cm and perpendicular height 9 cm. Find its area.

6. A learner gives this answer: “45 and 20.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. Split 65 counters in the ratio 9:4. How many belong in each group?

7. In a simplified fictional proportional-representation example with exactly 120 seats, a party receives 30% of the vote. Ignoring thresholds, electorate seats and rounding complications, how many seats would 30% represent?

TERM 2 · WEEK 3 · WHO HOLDS POWER?

Apply & reflect

Make thinking visible

Draw a cause → change → consequence chain or a labelled place-and-power map. Include four details from the printed evidence. Mark one missing voice or uncertain link. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Collect three relevant details from the printed weekly sources; label their origins.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

A pyramid is a clue, not a prophecy

Imagine two fictional countries with the same total population. Country Kōwhai has 24% of its population under 15 and 10% aged 65 or over. Country Rimu has 15% under 15 and 24% aged 65 or over. Those shapes suggest different possible pressures: Kōwhai may need relatively more school places over the near term, while Rimu may need relatively more services used by older people. But those are evidence-based possibilities, not guarantees. Migration, productivity, health, housing, government choices and future birth rates could all change the outcome. Population data are strongest when the shape is combined with other evidence.

Teaching note

Population structure changes when births, deaths and migration change. A wide younger base usually means a large share of children and young people; a narrower base with larger older groups can indicate an ageing population. The demographic-transition model describes a common long-term shift from high birth and death rates toward lower rates as societies change, but real countries do not all follow one identical path. Migration can also reshape particular age groups quickly. A population pyramid is useful evidence, but it cannot by itself explain why a pattern exists or exactly what will happen next.

1. Which detail would you put first in a summary, and why? Explain its importance.

2. Use “FICTIONAL COUNTRY KŌWHAI” and “LIMITATION” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Evidence desk · Read these alongside the passage.

LIMITATION: Age structure alone does not tell us income, health status, housing supply, productivity, policy choices or exact future behaviour.

Compare fictional population patterns. Explain different service pressures and the possible effect of migration. Distinguish a modelled possibility from a prediction.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 2 · WEEK 4 · POPULATION SHIFT

Maths & reasoning

Worked example

Split 65 counters in the ratio 8:5. How many belong in each group?

13 equal parts; each part is 5. Multiply each ratio number by this amount. Answer: 40 and 25.

1. Split 60 counters in the ratio 8:4. How many belong in each group?

2. Split 50 counters in the ratio 4:6. How many belong in each group?

3. A fictional vehicle travels 12 km at a steady 6 km/h. Find the time in hours and minutes.

4. A circle has radius 7 cm. Use $\pi = 3.14$ to find circumference and area.

5. Calculate $(6 \times 10^5) \div (2 \times 10^2)$. Give an ordinary number.

6. A learner gives this answer: “15 and 25.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. Split 40 counters in the ratio 3:5. How many belong in each group?

7. In fictional Country Kōwhai, 24% of the population is aged 0–14 and 10% is aged 65+. What is the simplest ratio of the younger group to the 65+ group?

TERM 2 · WEEK 4 · POPULATION SHIFT

Apply & reflect

Make thinking visible

Draw a cause → change → consequence chain or a labelled place-and-power map. Include four details from the printed evidence. Mark one missing voice or uncertain link. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Draft a diagram, table or outline. Mark a claim that needs checking.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Follow the flow — then check the limits

Imagine a household with wages coming in, bills and purchases going out, some money saved and some debt being repaid. If the prices of many everyday items rise while household income stays the same, the same income buys less. If borrowing becomes more expensive, some borrowers may face higher costs, although the timing and size depend on their contract. If employment income falls, the household may have to change spending, saving or borrowing decisions. Tax is another flow: governments collect revenue and use public money for services and spending. Consumer law also shapes everyday choices. In New Zealand, legal guarantees under the Consumer Guarantees Act are separate from an optional store warranty. A model can show these connections, but it cannot predict exactly how every household will respond.

Teaching note

An economy is a network of flows. Households can earn income from work, buy goods and services, save, borrow and pay tax. Businesses pay wages, sell products and services, invest and also face costs. Government collects tax and uses public money for services and other spending. Financial institutions connect saving and borrowing. Inflation means average prices are rising, so unchanged income buys less. Interest-rate changes can alter the cost of borrowing and returns on saving. Employment changes can alter household income and spending. None of these effects is identical for every person. In New Zealand, consumer law also matters: the Consumer Guarantees Act sets minimum guarantees for goods and services bought from businesses for personal or household use, and store warranties do not replace those legal rights.

1. What is the writer trying to help the reader understand? Support your answer with a detail.

2. Use “INFLATION” and “MODEL LIMIT” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Evidence desk · Read these alongside the passage.

MODEL LIMIT: The simulator uses invented household amounts and simplified flows. It is not a forecast and does not reproduce real tax brackets, lending contracts or every part of the New Zealand economy.

Explain connected money flows for a fictional household facing higher prices or reduced income. Consider a response, public services and two model limitations.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

Maths & reasoning

Worked example

A count rises from 200 to 260. Find the percentage increase.

Increase $\div$ original $\times 100 = 60 \div 200 \times 100 = 30\%$. Answer: 30%

1. A count rises from 200 to 250. Find the percentage increase.

2. A count rises from 120 to 132. Find the percentage increase.

3. A stall has fixed costs \$80, unit cost \$5, and price \$10. Find revenue and profit for 20 sales.

4. A \$40 item has 30% off. Calculate the saving and sale price.

5. A bag has 7 red and 3 blue tokens. A token is chosen at random. Find P(red) and P(not red).

6. A learner gives this answer: “30%” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A count rises from 100 to 130. Find the percentage increase.

7. A fictional weekly essentials basket rises from \$320 to \$336. What is the percentage increase?

TERM 2 · WEEK 5 · MONEY, TAX & ECONOMY

Apply & reflect

Make thinking visible

Draw a cause → change → consequence chain or a labelled place-and-power map. Include four details from the printed evidence. Mark one missing voice or uncertain link. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Add a numerical comparison and explain its context. Check units and denominators.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

A constitutional system is a set of roles, checks and overlaps

Imagine a fictional Government bill that would limit some public assemblies near a government facility. The Executive develops the policy and introduces the bill. The House debates it, and a select committee receives submissions and can recommend changes. Rights scrutiny asks whether protected rights are engaged and whether any proposed limit can be legally justified. If the House passes the bill, Royal assent is required before it becomes an Act. If a dispute later reaches a court, the judiciary independently interprets and applies the law. These steps do not guarantee that everyone agrees with the outcome. They show why constitutional reasoning depends on knowing which institution has which role, how public participation enters the process, and what evidence supports competing arguments.

Teaching note

New Zealand’s constitutional system distributes public power across institutions. Parliament makes law and scrutinises Government. The Executive develops policy and administers law. Courts interpret and apply law independently. Because New Zealand uses a Westminster system, the branches are not completely separate: Ministers are members of Parliament and Government must retain the confidence of the House. Bills can be examined by select committees, which can receive public submissions. The Governor-General gives Royal assent after a bill has been passed. The New Zealand Bill of Rights Act provides a framework for rights scrutiny: rights can be subject only to reasonable limits prescribed by law that are demonstrably justified in a free and democratic society.

1. Explain a contrast or tension in the passage. Refer to both sides.

2. Use “THREE BRANCHES” and “SUBMISSION LIMIT” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Maths & reasoning

Worked example

A count rises from 80 to 88. Find the percentage increase.

Increase $\div$ original $\times 100 = 8 \div 80 \times 100 = 10\%$. Answer: 10%

1. A count rises from 80 to 104. Find the percentage increase.

2. A count rises from 140 to 161. Find the percentage increase.

3. A \$40 item has 25% off. Calculate the saving and sale price.

4. Data: 5, 7, 7, 9, 12. Find the mean, median and range.

5. A stall has fixed costs \$80, unit cost \$5, and price \$10. Find revenue and profit for 20 sales.

6. A learner gives this answer: “10%” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A count rises from 120 to 132. Find the percentage increase.

7. A fictional select committee receives 420 submissions. 252 support an amendment. What percentage is that?

TERM 2 · WEEK 6 · GOVERNMENT LAB

Apply & reflect

Make thinking visible

Draw a cause → change → consequence chain or a labelled place-and-power map. Include four details from the printed evidence. Mark one missing voice or uncertain link. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Write a fair counterpoint. Identify a gap or voice the project does not represent.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

A hazard starts the story; systems shape what happens next

Imagine two communities exposed to the same earthquake shaking. In one, strengthened critical buildings remain usable, water has backup storage and communications can switch to another system. In the other, a bridge failure cuts the main route, a damaged water main affects homes and the hospital, and communications fail at the same time. The earthquake is the physical hazard in both places, but exposure, vulnerability and resilience change the consequences. Some impacts are direct, such as damaged buildings or pipes. Others are indirect, such as delayed deliveries, business closures or healthcare disruption. Effective hazard planning therefore looks beyond the event itself and asks which people, places and systems are exposed, how failures connect, and which investments reduce the most serious consequences.

Teaching note

The size of a hazard does not, by itself, determine the size of a disaster. Risk is shaped by the physical hazard together with what is exposed, how vulnerable people and systems are, and what preparation or resilience is already in place. An earthquake can directly damage buildings, roads and pipes; those direct effects can then create indirect impacts such as disrupted water, closed businesses, delayed healthcare, school closures or supply problems. Hazard management therefore asks HAZARD → EXPOSURE → VULNERABILITY → IMPACT CHAIN → RESILIENCE. A useful plan reduces risk, but no model or budget can make risk zero.

1. Identify one explicit fact and one reasonable inference. Explain the evidence for the inference.

2. Use “SAME HAZARD” and “MODEL LIMIT” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Write & communicate

Evidence desk • Read these alongside the passage.

SAME HAZARD: Both fictional communities receive the same earthquake shaking scenario. Different outcomes therefore cannot be explained by hazard size alone.

EXPOSURE: Community Rimu has more homes, a hospital and a major bridge located in the highest-shaking zone, increasing the number of people and systems exposed.

VULNERABILITY: Several critical systems in Community Rimu depend on one bridge, one water main and one communications link, so a single failure can affect multiple services.

RESILIENCE: Community Kōwhai has backup water storage, alternative communications and strengthened critical facilities. These measures do not stop the earthquake but can reduce disruption and speed recovery.

MODEL LIMIT: The Hazard Lab uses invented costs and simplified probabilities. It is designed for reasoning practice, not as an engineering assessment or prediction for a real community.

Your writing brief

Compare hazard impacts in two fictional communities. Trace direct and indirect effects, recommend a resilience priority and explain a cost or equity trade-off.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 2 • WEEK 7 • HAZARD LAB

Maths & reasoning

Worked example

A stall has fixed costs \$40, unit cost \$4, and price \$9. Find revenue and profit for 20 sales.

Profit = revenue – variable costs – fixed costs = $180 - 80 - 40$. A negative result is a loss. Answer: Revenue \$180; profit \$60.

1. A stall has fixed costs \$40, unit cost \$3, and price \$8. Find revenue and profit for 20 sales.

2. A stall has fixed costs \$70, unit cost \$5, and price \$10. Find revenue and profit for 20 sales.

3. Solve $3x + 6 = 27$. Show how you check x.

4. A fictional vehicle travels 12 km at a steady 6 km/h. Find the time in hours and minutes.

5. Sequence: 5, 14, 23, 32. Give the next two terms and a rule for term n.

6. A learner gives this answer: “Revenue \$180; profit \$40.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A stall has fixed costs \$60, unit cost \$4, and price \$9. Find revenue and profit for 20 sales.

7. A \$20.0 million resilience budget funds a \$9.2m hospital retrofit, a \$4.8m water upgrade and a \$2.6m communications backup. How much remains?

TERM 2 · WEEK 7 · HAZARD LAB

Apply & reflect

Make thinking visible

Draw a cause → change → consequence chain or a labelled place-and-power map. Include four details from the printed evidence. Mark one missing voice or uncertain link. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Make a draft page or paper prototype. Ask someone to comment, or use the checklist yourself.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Stories explain experience; data shows patterns

A fictional population desk is tracking movement between places. One young adult leaves a smaller town for tertiary study but continues to return home and contribute to whānau life. Another family moves internationally for both family connection and employment. At the same time, district data shows a decrease in one age group even though the overall population is nearly stable. In a receiving area, population growth is faster than growth in the rental housing supply. These sources tell different kinds of stories. Personal accounts can reveal motives and lived experience. Population data can show scale and pattern. Strong geographic reasoning uses both without pretending either source can answer every question alone.

Teaching note

Migration changes people and places, but simple stories such as “everyone moves for one reason” are usually too weak. Use PATHWAY → FACTORS → SCALE → IMPACTS → LIMITS. A personal account can explain one person or whānau’s experience in depth. Population data can show broader patterns but may not explain every motive. Reasons can include work, study, family connection, housing, safety, lifestyle or environmental conditions, and several factors can interact. Effects on origin and destination places may include changes in age structure, labour supply, services, housing demand, cultural connections and remittances or family support. This lesson uses fictional people and data; learners do not need to disclose their own migration histories.

1. Suggest a more precise alternative title. Explain how it represents the passage accurately.

2. Use “PERSONAL ACCOUNT A” and “GENERALISATION WARNING” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Evidence desk · Read these alongside the passage.

GENERALISATION WARNING: One migration story cannot establish why a whole population moves, and a population graph cannot describe every individual experience.

Explain changes in origin and destination places. Distinguish an individual account from population evidence and avoid generalising about every migrant.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 2 • WEEK 8 • PEOPLE ON THE MOVE

Maths & reasoning

Worked example

A count rises from 120 to 144. Find the percentage increase.

Increase $\div$ original $\times 100 = 24 \div 120 \times 100 = 20\%$. Answer: 20%

1. A count rises from 120 to 138. Find the percentage increase.

2. A count rises from 180 to 225. Find the percentage increase.

3. A triangle has base 8 cm and perpendicular height 5 cm. Find its area.

4. Calculate $(7 \times 10^5) \div (4 \times 10^2)$. Give an ordinary number.

5. A circle has radius 8 cm. Use $\pi = 3.14$ to find circumference and area.

6. A learner gives this answer: “20%” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A count rises from 160 to 192. Find the percentage increase.

7. A fictional district’s 18–29 population falls from 4,000 to 3,400. What is the percentage decrease?

TERM 2 · WEEK 8 · PEOPLE ON THE MOVE

Apply & reflect

Make thinking visible

Draw a cause → change → consequence chain or a labelled place-and-power map. Include four details from the printed evidence. Mark one missing voice or uncertain link. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Revise one choice in response to evidence or feedback. Record before and after.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

A defensible case is often narrower after challenge

A final interpretation should become more precise as evidence is tested. Historical sources may establish context or perspective. Civic records can show institutional action and participation. Geographic and population data can reveal patterns across place and time. Economic evidence can show costs, flows or changes. The challenge is not to collect the largest possible pile of material. It is to select sources that answer the question, identify where they disagree or operate at different scales, and revise claims that reach beyond them. At the summit, a strong response to counter-evidence may be to narrow the conclusion, distinguish correlation from cause or identify what remains uncertain.

Teaching note

Year 8 synthesis means making choices without being told the operation, source or conclusion in advance. Use FRAME → SELECT → TEST → CHALLENGE → REVISE → DEFEND. FRAME a focused question. SELECT evidence because it is relevant, not because it agrees with you. TEST whether your numbers and sources really support the claim. CHALLENGE the case with the strongest counter-evidence or alternative explanation. REVISE anything that overreaches. DEFEND the narrower interpretation that the evidence can still support. Changing a claim after good challenge is stronger reasoning, not failure.

1. What conclusion does this passage support, and what would go beyond its evidence?

2. Use “HISTORICAL SOURCE” and “COUNTER-EVIDENCE” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Maths & reasoning

Worked example

A result changes from 35% to 50%. Find the percentage-point change AND relative percentage increase.

$50 - 35 = 15$ points. Relative change = $15 \div 35 \times 100$. These measures answer different questions. Answer: 15 percentage points; 42.9% relative increase.

1. A result changes from 35% to 50%. Find the percentage-point change AND relative percentage increase.

2. A result changes from 50% to 65%. Find the percentage-point change AND relative percentage increase.

3. Translate point (5, -3) by (-4, 5). Give the new point and describe the movement.

4. Temperature starts at -8°C , rises 7°C , then falls 10°C . What is it now?

5. Temperature starts at -4°C , rises 4°C , then falls 4°C . What is it now?

6. A learner gives this answer: “15 percentage points; 33.3% relative increase.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A result changes from 45% to 60%. Find the percentage-point change AND relative percentage increase.

7. A case study compares two fictional areas. Area A grows from 24,000 to 27,600 people while Area B grows from 8,000 to 9,600. Which area has the larger percentage growth?

TERM 2 · WEEK 9 · POWER & PLACE SUMMIT

Apply & reflect

Make thinking visible

Draw a cause → change → consequence chain or a labelled place-and-power map. Include four details from the printed evidence. Mark one missing voice or uncertain link. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Finish the paper project and write a qualified conclusion. Reflect on one next step.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

TERM 2 · REVIEW AND PROJECT SHOWCASE

Pause, check, improve

1. Summarise the most important idea from this term in your own words.

2. Choose two weeks. Explain a connection between their evidence or systems.

3. Correct one maths error. Show the original misconception and a reliable method.

4. Present your paper project: central claim, strongest evidence and a limitation.

5. What changed after a counterpoint, test or feedback? Give a specific example.

6. Set one achievable next step. What support or strategy will help?

TERM 3 • PLAN YOUR INQUIRY

SYSTEMS UNDER PRESSURE

What happens when a system is pushed — and how can we understand, repair or improve it?

Choose a biological, environmental, physical, engineered or community-infrastructure system; map it, find weak points, model disruption, design an improvement, test, revise and present a more resilient solution.

The nine-week route

1. Inheritance Lab
2. Adapt or Change
3. Mixture Mystery
4. Change Lab
5. Circuit City
6. Pressure Lab
7. Space Systems
8. Build It Better
9. System Failure: Blackout

Project question:

Audience and purpose:

What I already know / what I need to find out:

Read & investigate

Inheritance is an information system — but the model has limits

DNA stores genetic information. Chromosomes package long DNA molecules, and genes are sections of DNA within those chromosomes. Different versions of a gene are called alleles. During sexual reproduction, genetic information from two parents is combined, so offspring can inherit different allele combinations. This contributes to variation within a population. A simplified inheritance grid can calculate the probability of particular allele combinations, but probability does not guarantee the outcome for one individual. The model is also deliberately limited: many real characteristics involve many genes as well as environmental and developmental influences. Good scientific reasoning uses the simple model for the question it can answer without pretending it explains everything.

Teaching note

Genetic information is stored in DNA. Long DNA molecules are packaged into CHROMOSOMES, and GENES are sections of DNA that contribute to biological characteristics. Different versions of a gene are called ALLELES. In sexual reproduction, offspring receive genetic information from two parents, producing new combinations of alleles and contributing to variation. For learning, a one-gene model can show how allele combinations produce probabilities, but many real characteristics are influenced by multiple genes, environment and development. Use INFORMATION → COMBINATION → POSSIBLE OUTCOMES → VARIATION → MODEL LIMITS.

1. Identify the main claim or problem. Give one detail that helps a reader understand it.

2. Use “DNA” and “MODEL LIMIT” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Write & communicate

Evidence desk
 ·
 Read these alongside the passage.

DNA: DNA carries genetic information. Genes are sections of DNA rather than separate substances floating outside it.

CHROMOSOMES: Chromosomes are structures containing long DNA molecules. In sexually reproducing organisms, offspring inherit chromosome sets through reproductive cells from two parents.

ALLELES: Alleles are different versions of the same gene. A simplified model can track which allele version is inherited from each parent.

VARIATION: Sexual reproduction creates new combinations of genetic information. Genetic variation can arise from inherited differences, while many observed characteristics are also influenced by environmental factors.

MODEL LIMIT: A single-gene Punnett-style model is useful for learning probability, but it does not represent the full complexity of most human traits.

Your writing brief

Explain DNA, chromosome, gene and allele. Interpret a Gg × Gg model, explain variation and state two limits of a simplified one-gene model.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check:
 ☐
 clear purpose
 ☐
 evidence
 ☐
 linked ideas
 ☐
 precise words
 ☐
 punctuation

TERM 3 • WEEK 1 • INHERITANCE LAB

Maths & reasoning

Worked example

A bag has 7 red and 6 blue tokens. A token is chosen at random. Find $P(\text{red})$ and $P(\text{not red})$.

Count equally likely tokens, not colour names; probabilities add to 1. Answer: $P(\text{red}) = 7/13$; $P(\text{not red}) = 6/13$.

1. A bag has 7 red and 5 blue tokens. A token is chosen at random. Find $P(\text{red})$ and $P(\text{not red})$.

2. A bag has 3 red and 2 blue tokens. A token is chosen at random. Find $P(\text{red})$ and $P(\text{not red})$.

3. Fixed costs are \$72; price is \$9; unit cost is \$4. Find the minimum whole sales to break even.

4. A cuboid measures 9 cm $\times$ 6 cm $\times$ 4 cm. Find its volume.

5. Translate point (5, -3) by (-4, 5). Give the new point and describe the movement.

6. A learner gives this answer: " $P(\text{red}) = 3/5$; $P(\text{not red}) = 2/5$." to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A bag has 9 red and 6 blue tokens. A token is chosen at random. Find $P(\text{red})$ and $P(\text{not red})$.

7. In a simplified fictional one-gene model, two parents each have genotype Gg. What proportion of the four equally likely model combinations is gg?

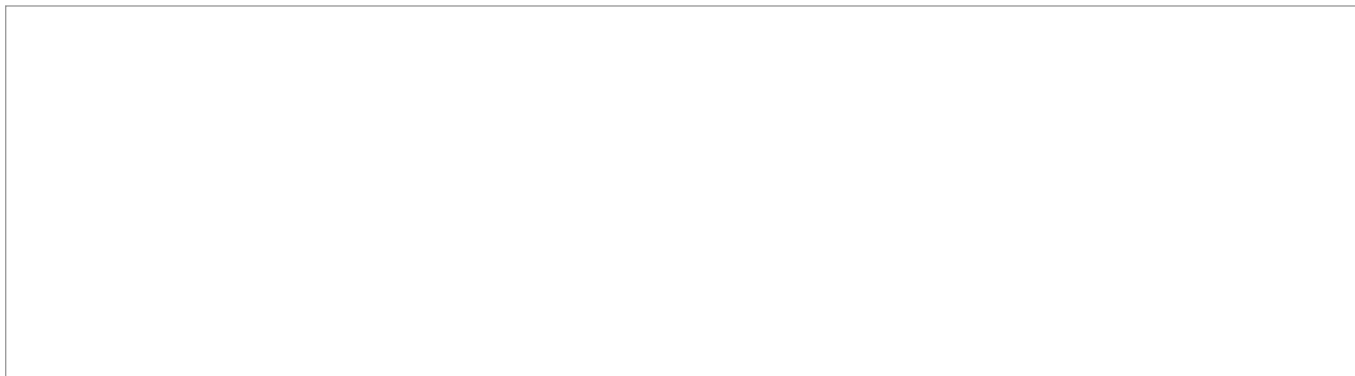
TERM 3 · WEEK 1 · INHERITANCE LAB

Apply & reflect

Make thinking visible

Draw a labelled system model with at least four parts and arrows showing interactions. Mark a possible failure point, its downstream effect and one proposed improvement. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.



Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Choose a focused question and a fictional audience. Record why the question matters.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Populations change; individuals do not evolve on command

A population can contain inherited differences before the environment changes. If conditions shift, those differences may matter. In the Evolution Observatory model, a change in seed hardness can alter which inherited bill variants are more successful at feeding and reproducing. Across generations, this can change the proportion of each variant in the population. That does not mean an individual bird deliberately remodelled its bill because it needed to survive. It also does not mean one graph proves the whole causal story. Strong evolutionary reasoning connects environmental conditions with inherited variation, survival and reproduction, while checking whether other variables changed at the same time.

Teaching note

Populations contain VARIATION. Some variation is inherited. When environmental conditions change, inherited variants can differ in survival or reproductive success. If individuals with one inherited variant leave more offspring, that variant may become more common over many generations. This is not an individual choosing or developing the trait it needs. Use VARIATION → PRESSURE → DIFFERENTIAL SURVIVAL/REPRODUCTION → INHERITANCE → POPULATION CHANGE. A graph of changing trait frequency shows WHAT changed; explaining WHY also requires evidence about conditions, survival, reproduction and alternative variables.

1. Summarise the passage in two sentences. Keep facts separate from opinion or inference.

2. Use “STARTING POPULATION” and “MODEL LIMIT” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 3 · WEEK 2 · ADAPT OR CHANGE

Maths & reasoning

Worked example

A result changes from 45% to 60%. Find the percentage-point change AND relative percentage increase.

$60 - 45 = 15$ points. Relative change = $15 \div 45 \times 100$. These measures answer different questions. Answer: 15 percentage points; 33.3% relative increase.

1. A result changes from 45% to 60%. Find the percentage-point change AND relative percentage increase.

2. A result changes from 25% to 40%. Find the percentage-point change AND relative percentage increase.

3. Calculate $7/12 \div 5/13$. Give a simplified fraction.

4. 6 pages are printed in 2 minutes at a constant rate. Find the rate and time for 18 pages.

5. Split 50 counters in the ratio 6:4. How many belong in each group?

6. A learner gives this answer: “15 percentage points; 75.0% relative increase.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A result changes from 20% to 35%. Find the percentage-point change AND relative percentage increase.

7. The deeper-bill trait rises from 36% of the population in Generation 1 to 76% in Generation 6. What is the change in percentage points?

TERM 3 · WEEK 2 · ADAPT OR CHANGE

Apply & reflect

Make thinking visible

Draw a labelled system model with at least four parts and arrows showing interactions. Mark a possible failure point, its downstream effect and one proposed improvement. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Define three key terms and decide what counts as convincing evidence.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Choose the property before you choose the method

Sample 8B is deliberately messy. Iron filings can be targeted because they respond to a magnet. Gravel and fine sand are both undissolved solids, but their particle sizes differ, so a coarse sieve can remove the gravel before a finer filter removes the sand. The liquid that passes through the filter may look clear, yet it still contains dissolved salt. To recover water from that solution, the virtual lab uses distillation: water is vaporised, then condensed into a separate container, while the non-volatile salt remains behind. If the goal were only to recover the salt, evaporation or crystallisation could be considered instead. Each method solves a particular separation problem; none is a universal cleaner.

Teaching note

A MIXTURE contains substances physically combined rather than chemically joined into one new substance. In a SOLUTION, a SOLUTE is dissolved in a SOLVENT. Separation works by exploiting differences in physical properties. A magnet can remove magnetic material; sieving separates sufficiently different particle sizes; filtration traps undissolved particles that are larger than the filter pores; evaporation can leave a dissolved solid behind; distillation can collect a solvent after it vaporises and condenses. The best sequence depends on the materials present and what you are trying to recover. In this virtual lab, never assume “clear-looking” means pure.

1. Explain a cause-and-effect relationship in the passage. Use a specific detail.

2. Use “SAMPLE 8B · virtual composition” and “TEMPERATURE DATA · Crystal Q” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Evidence desk · Read these alongside the passage.

TEMPERATURE DATA · Crystal Q: A separate fictional solubility test for Crystal Q records 12 g dissolving per 100 mL at 20°C and 28 g per 100 mL at 60°C. The data apply to Crystal Q only and should not be generalised to every solute.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 3 • WEEK 3 • MIXTURE MYSTERY

Maths & reasoning

Worked example

Split 60 counters in the ratio 9:3. How many belong in each group?

12 equal parts; each part is 5. Multiply each ratio number by this amount. Answer: 45 and 15.

1. Split 55 counters in the ratio 9:2. How many belong in each group?

2. Split 45 counters in the ratio 5:4. How many belong in each group?

3. Sequence: 6, 14, 22, 30. Give the next two terms and a rule for term n .

4. Calculate $4/7 \div 3/8$. Give a simplified fraction.

5. A map uses 1 cm : 30 km. Two places are 7 cm apart on the map. Find the actual distance.

6. A learner gives this answer: "20 and 15." to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. Split 35 counters in the ratio 4:3. How many belong in each group?

7. The 300 mL virtual sample contains 18 g of dissolved salt. What is the concentration in grams per 100 mL?

TERM 3 · WEEK 3 · MIXTURE MYSTERY

Apply & reflect

Make thinking visible

Draw a labelled system model with at least four parts and arrows showing interactions. Mark a possible failure point, its downstream effect and one proposed improvement. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Collect three relevant details from the printed weekly sources; label their origins.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Evidence of change is stronger when several clues agree

Change Lab begins with observations, not labels. A solid melting into its liquid state is a physical change because the substance remains the same material. Dissolving can also be a physical change: the dissolved substance may still be present even when it cannot be seen. By contrast, when the model shows atoms rearranged into new particle combinations with new properties, the evidence supports chemical change. Scientists often use clues such as gas formation, precipitates, temperature change or colour change, but they interpret those observations in context. A single clue can have more than one explanation. Reversibility can also help, but it should not be treated as a perfect test. Strong classification combines observations, particle-level reasoning and evidence about whether new substances formed.

Teaching note

A PHYSICAL CHANGE alters state, shape, size or arrangement without forming a new substance. A CHEMICAL CHANGE forms one or more new substances through a chemical reaction. Scientists look for several kinds of evidence: unexpected gas production, formation of a new solid (a precipitate), sustained energy changes, colour changes or other new properties. But no single visual clue is a universal proof. Colour can change by mixing, bubbles can come from boiling, and temperature can change during physical processes too. REVERSIBILITY is also not a perfect shortcut: some physical changes are difficult to reverse and some chemical reactions can be reversed under suitable conditions. Use OBSERVATION → POSSIBLE EXPLANATIONS → EVIDENCE → CLASSIFICATION → LIMIT.

1. Which detail would you put first in a summary, and why? Explain its importance.

2. Use “CASE A · MELTING” and “INDICATOR LIMIT” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 3 · WEEK 4 · CHANGE LAB

Maths & reasoning

Worked example

Temperature starts at -3°C , rises 6°C , then falls 8°C . What is it now?

$-3 + 6 - 8 = -5$. Use a number line if useful. Answer: -5°C .

1. Temperature starts at -3°C , rises 5°C , then falls 6°C . What is it now?

2. Temperature starts at -6°C , rises 7°C , then falls 10°C . What is it now?

3. A cuboid measures $9\text{ cm} \times 2\text{ cm} \times 4\text{ cm}$. Find its volume.

4. A bag has 5 red and 4 blue tokens. A token is chosen at random. Find $P(\text{red})$ and $P(\text{not red})$.

5. A \$50 item has 30% off. Calculate the saving and sale price.

6. A learner gives this answer: “ -7°C .” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. Temperature starts at -5°C , rises 6°C , then falls 8°C . What is it now?

7. A virtual reaction starts at 21°C and reaches a maximum of 29°C . What is the temperature increase?

TERM 3 · WEEK 4 · CHANGE LAB

Apply & reflect

Make thinking visible

Draw a labelled system model with at least four parts and arrows showing interactions. Mark a possible failure point, its downstream effect and one proposed improvement. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Draft a diagram, table or outline. Mark a claim that needs checking.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Resilience depends on paths, measurements and the kind of fault

Circuit City uses a deliberately simplified low-voltage model. In a series layout, both lamps share one continuous path. If that path is opened at Lamp 1, current through the loop stops and Lamp 2 also goes out. In a parallel layout, each lamp sits on its own branch across the supply. Opening one branch can leave the other branch complete, allowing the second lamp to keep operating. Meter readings add evidence that a visual inspection cannot provide. They can show whether current is flowing and how voltage is distributed. A robust diagnosis also distinguishes an open path from an unintended low-resistance bypass, because the system behaviour and risks are different.

Teaching note

A working circuit needs a SOURCE and a COMPLETE CONDUCTING PATH. CURRENT describes the rate of charge flow; VOLTAGE describes a potential difference that can transfer energy through components. In a SERIES circuit, components share one path, so an open anywhere in that path can stop current through the whole loop. In a PARALLEL circuit, separate branches can provide independent complete paths, so one open branch does not necessarily stop the others. The idealised model also uses $V = IR$ for simple comparisons. Diagnose with SOURCE → PATH → MEASURE → FAULT → REDESIGN. Household mains systems involve hazards and protection requirements that are outside this virtual model.

1. What is the writer trying to help the reader understand? Support your answer with a detail.

2. Use “SERIES · 3 V · no fault” and “UNSAFE GENERALISATION” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 3 · WEEK 5 · CIRCUIT CITY

Maths & reasoning

Worked example

Solve $4x + 5 = 37$. Show how you check x .

Subtract 5, then divide by 4; check $4 \times 8 + 5 = 37$. Answer: $x = 8$.

1. Solve $4x + 4 = 32$. Show how you check x .

2. Solve $7x + 6 = 48$. Show how you check x .

3. Convert 3.3 kg to grams, then find the mass of one of 5 equal portions.

4. Translate point (6, -5) by (-4, 5). Give the new point and describe the movement.

5. A cuboid measures 9 cm $\times$ 2 cm $\times$ 4 cm. Find its volume.

6. A learner gives this answer: " $x = 4$." to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. Solve $6x + 5 = 29$. Show how you check x .

7. In the idealised model, one 6 Ω lamp branch is connected across a 3 V supply. Using $I = V \div R$, what current flows in that branch?

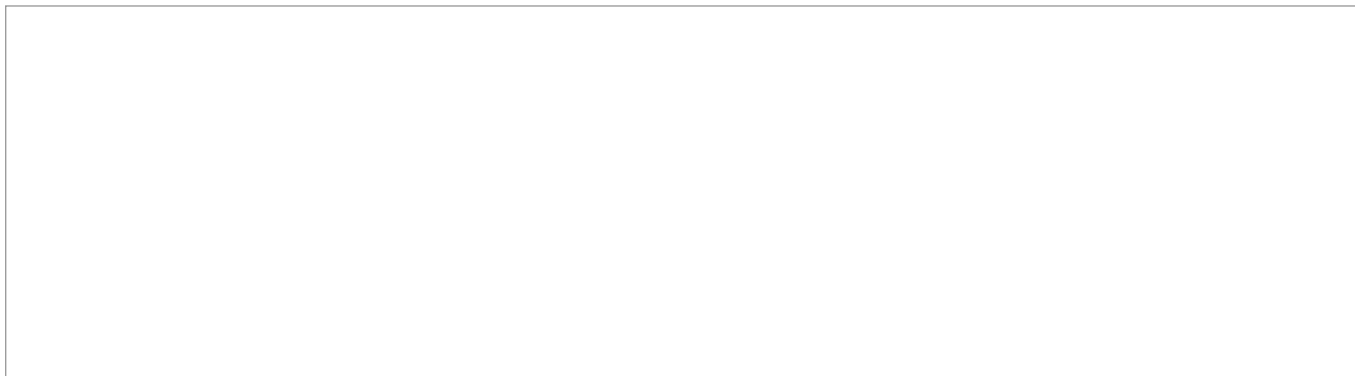
TERM 3 · WEEK 5 · CIRCUIT CITY

Apply & reflect

Make thinking visible

Draw a labelled system model with at least four parts and arrows showing interactions. Mark a possible failure point, its downstream effect and one proposed improvement. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.



Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Add a numerical comparison and explain its context. Check units and denominators.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Pressure turns geometry into a force-system decision

Two designs can carry the same force yet interact very differently with a surface. If the force is spread across a large contact area, the average pressure is lower. If the area becomes smaller while the force stays the same, the pressure rises. This is why engineers cannot simply ask whether high pressure or low pressure is “better”. A support foundation may need to spread load to avoid sinking or damaging a surface, while a blade may need to concentrate force to cut. The simple equation provides a useful first model, but real design also depends on material strength, deformation, stability, wear and how evenly the load is distributed.

Teaching note

PRESSURE describes how much force acts over a given area. In the idealised model, $P = F \div A$. If the same force is spread over a larger area, pressure decreases. If that force is concentrated onto a smaller area, pressure increases. Engineers use both effects: foundations and snowshoes spread loads; sharp edges and points concentrate force. The correct design depends on purpose, material strength, stability and safety. Use PURPOSE → FORCE → AREA → PRESSURE → MATERIAL RESPONSE → REDESIGN.

1. Explain a contrast or tension in the passage. Refer to both sides.

2. Use “SMALL AREA” and “MODEL LIMIT” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Write & communicate

Evidence desk · Read these alongside the passage.

SMALL AREA: A 600 N force spread over 0.02 m² gives 30,000 Pa in the idealised model.

MEDIUM AREA: The same 600 N force spread over 0.06 m² gives 10,000 Pa.

LARGE AREA: The same 600 N force spread over 0.12 m² gives 5,000 Pa. Holding force constant isolates the effect of area in this model.

DESIGN CONTEXT: Wide foundations, tracks and snowshoes can reduce pressure on a supporting surface. Cutting edges, needles and points may deliberately concentrate force over a small area.

MODEL LIMIT: The $P = F \div A$ calculation assumes an idealised average pressure over a known contact area. Real materials can deform and loads can be uneven, creating local stresses the simple model does not show.

Your writing brief

Explain pressure using force and contact area. Compare two calculations with units and discuss a structural limitation of load spreading.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

Maths & reasoning

Worked example

A rectangle is 10 cm by 8 cm. Find its perimeter and area, with units.

Perimeter = $2(\text{length} + \text{width})$; area = $\text{length} \times \text{width}$. Units differ. Answer: Perimeter 36 cm; area 80 cm².

1. A rectangle is 10 cm by 7 cm. Find its perimeter and area, with units.

2. A rectangle is 13 cm by 4 cm. Find its perimeter and area, with units.

3. Calculate $(4 \times 10^5) \div (4 \times 10^2)$. Give an ordinary number.

4. A result changes from 40% to 55%. Find the percentage-point change AND relative percentage increase.

5. A result changes from 20% to 35%. Find the percentage-point change AND relative percentage increase.

6. A learner gives this answer: “Perimeter 40 cm; area 96 cm².” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A rectangle is 12 cm by 8 cm. Find its perimeter and area, with units.

7. A 900 N force is spread evenly over 0.06 m². What is the idealised pressure?

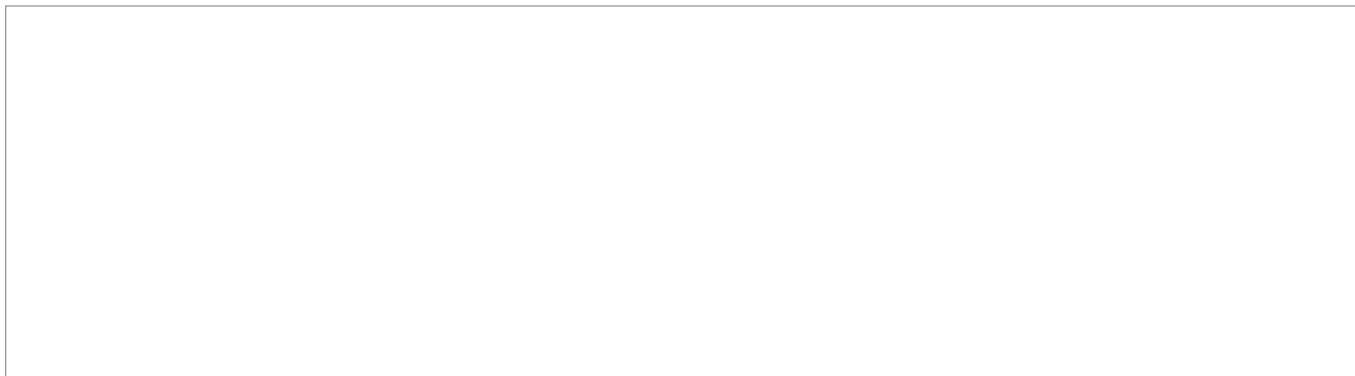
TERM 3 · WEEK 6 · PRESSURE LAB

Apply & reflect

Make thinking visible

Draw a labelled system model with at least four parts and arrows showing interactions. Mark a possible failure point, its downstream effect and one proposed improvement. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.



Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Write a fair counterpoint. Identify a gap or voice the project does not represent.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

A useful space diagram is usually wrong in at least one kind of scale

Astronomical systems are so large that almost every classroom diagram makes compromises. If Earth and the Moon are drawn large enough to see, their separation is usually compressed. If the Earth–Sun distance is shown on the same page, object sizes may be exaggerated even more. That does not make the model useless, but it means the learner must know which relationship the model is designed to show. Gravity explains why moons and planets follow curved orbital paths rather than travelling away in straight lines. The Sun illuminates half of the Moon, and phases arise because our viewing geometry changes as the Moon orbits Earth. Earth’s seasons come mainly from axial tilt and the resulting changes in sunlight angle and day length. Strong space reasoning keeps both the physical system and the limitations of the model visible.

Teaching note

Space systems operate across scales that are difficult to draw honestly. A PLANET can orbit a STAR, a MOON can orbit a PLANET, and a SOLAR SYSTEM contains its star plus the objects gravitationally bound to it. A GALAXY contains huge numbers of stars and their systems. GRAVITY is the interaction that keeps orbiting bodies changing direction while their motion carries them forward. Scale matters: the average Earth–Moon distance is about 3.84×10^5 km, while Earth is about 1.50×10^8 km from the Sun on average — roughly 390 times farther. Sun–Earth–Moon diagrams are often not to scale. Moon phases are caused by the changing portion of the Moon’s sunlit half that we see from Earth, not by Earth’s shadow except during a lunar eclipse. Earth’s seasons are driven mainly by axial tilt, not by being much closer to or farther from the Sun. Use OBJECT → GRAVITY → ORBIT → SCALE → RELATIONSHIP → MODEL LIMIT.

1. Identify one explicit fact and one reasonable inference. Explain the evidence for the inference.

2. Use “SCALE FILE” and “MODEL LIMIT” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 3 • WEEK 7 • SPACE SYSTEMS

Maths & reasoning

Worked example

Calculate $(6 \times 10^5) \div (2 \times 10^2)$. Give an ordinary number.

Divide coefficients and subtract powers: $(6 \div 2) \times 10^3$. Answer: 3,000.00 (rounded to 2 d.p.).

1. Calculate $(6 \times 10^5) \div (6 \times 10^2)$. Give an ordinary number.

2. Calculate $(9 \times 10^5) \div (3 \times 10^2)$. Give an ordinary number.

3. Split 50 counters in the ratio 5:5. How many belong in each group?

4. Solve $8x + 2 = 50$. Show how you check x .

5. A rectangle is 9 cm by 6 cm. Find its perimeter and area, with units.

6. A learner gives this answer: “4,000.00 (rounded to 2 d.p.).” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. Calculate $(8 \times 10^5) \div (2 \times 10^2)$. Give an ordinary number.

7. Using 1.50×10^8 km for Earth–Sun distance and 3.84×10^5 km for Earth–Moon distance, approximately how many times farther is the Sun from Earth than the Moon is?

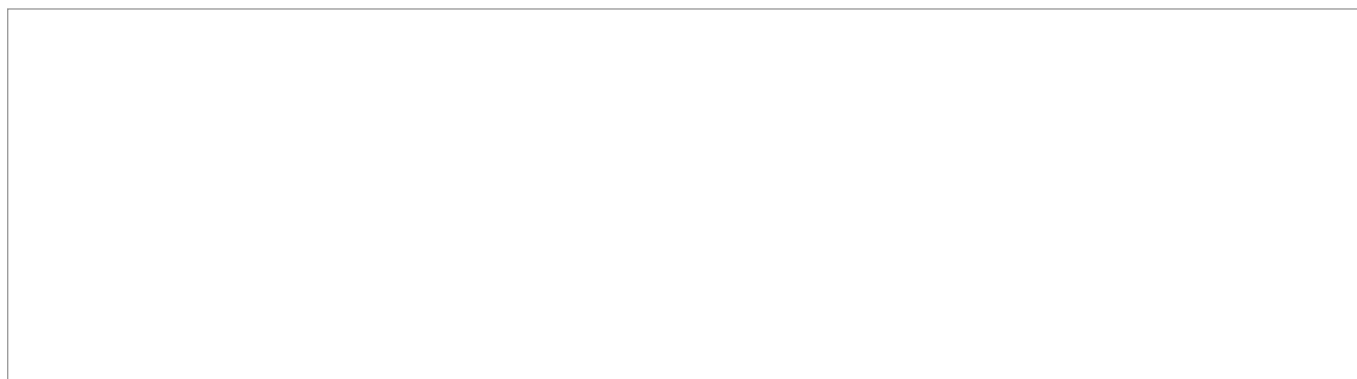
TERM 3 • WEEK 7 • SPACE SYSTEMS

Apply & reflect

Make thinking visible

Draw a labelled system model with at least four parts and arrows showing interactions. Mark a possible failure point, its downstream effect and one proposed improvement. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.



Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Make a draft page or paper prototype. Ask someone to comment, or use the checklist yourself.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Integration creates dependencies — and dependencies create both capability and risk

A final engineering system can include a structure, energy supply, drive mechanism, sensors and control logic. Each subsystem may work well alone, but integration creates dependencies. If the controller depends on a sensor and the sensor fails, the control system may lose useful information. If every subsystem depends on one power source, a single power fault can affect the whole system. Redundancy can reduce that vulnerability, but duplicate components also use materials, budget and maintenance effort. A defensible final design therefore compares normal performance with fault behaviour, records constraints and accepts that resilience is one objective among several rather than a licence to add unlimited backup systems.

Teaching note

INTEGRATION changes the engineering problem. A strong component can still sit inside a weak system if dependencies are poorly designed. FEEDBACK allows information about system state to affect control. REDUNDANCY provides another path or resource when one fails. Both can improve resilience, but they add cost, materials, energy use or complexity. Optimisation therefore means finding a defensible balance across CRITERIA + CONSTRAINTS + FAILURE BEHAVIOUR + TRADE-OFFS. To compare fault responses fairly, lock the architecture and change the test condition rather than redesigning between each trial.

1. Suggest a more precise alternative title. Explain how it represents the passage accurately.

2. Use “NORMAL OPERATION” and “WHOLE-SYSTEM EVALUATION” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 3 • WEEK 8 • BUILD IT BETTER

Maths & reasoning

Worked example

A count rises from 160 to 184. Find the percentage increase.

Increase $\div$ original $\times 100 = 24 \div 160 \times 100 = 15\%$. Answer: 15%

1. A count rises from 160 to 176. Find the percentage increase.

2. A count rises from 80 to 96. Find the percentage increase.

3. Data: 6, 8, 8, 10, 13. Find the mean, median and range.

4. Two angles in a triangle are 50° and 60° . Find the third and explain.

5. Fixed costs are \$60; price is \$10; unit cost is \$5. Find the minimum whole sales to break even.

6. A learner gives this answer: “15%” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A count rises from 200 to 230. Find the percentage increase.

7. A system’s performance score falls from 88 under normal operation to 66 under a fault. What is the percentage decrease relative to the normal score, rounded to the nearest whole percent?

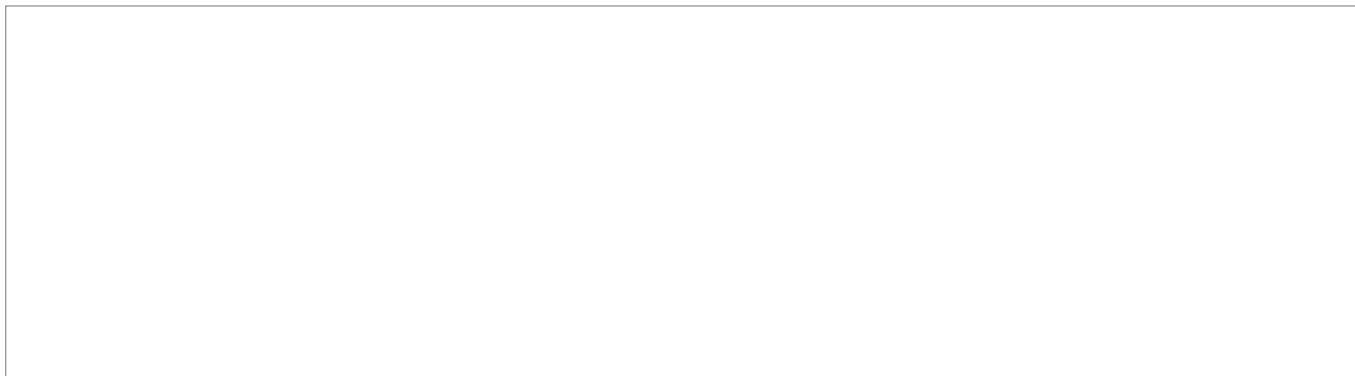
TERM 3 · WEEK 8 · BUILD IT BETTER

Apply & reflect

Make thinking visible

Draw a labelled system model with at least four parts and arrows showing interactions. Mark a possible failure point, its downstream effect and one proposed improvement. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.



Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Revise one choice in response to evidence or feedback. Record before and after.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

TERM 3 • WEEK 9 • SYSTEM FAILURE: BLACKOUT

Read & investigate

Incomplete evidence rewards the hypothesis that survives challenge

Facility Zero goes dark at 02:14, but the dashboard does not provide a perfect story. One pressure sensor reports a dramatic drop while another sensor disagrees. The process tank warms after ventilation fails, which could be consistent with reduced heat removal rather than an internal chemical reaction. Biological conditions drift later, after several supporting systems are already unstable. Meanwhile, delayed data packets mean the order displayed on screen is not necessarily the order events actually occurred. A strong diagnosis therefore compares hypotheses, checks independent evidence and prioritises mechanisms that explain several observations while surviving counter-evidence. The final redesign should not only repair the failed component; it should reduce the ability of one controller or data failure to propagate through the whole facility.

Teaching note

Year 8 diagnosis uses HYPOTHESIS → EVIDENCE → MECHANISM → COUNTER-EVIDENCE → PRIORITY → REDESIGN. Do not start with a favourite explanation and force every clue into it. Build at least two plausible hypotheses, identify what each predicts, and test them against the evidence. In a cascading failure, the initiating fault may be electrical while later symptoms appear chemical, biological, thermal or mechanical. Observability matters: delayed or faulty sensors can hide the true sequence. Resilient systems use redundancy, segmentation, fail-safe states, backup pathways and independent monitoring so one fault does not automatically propagate everywhere.

1. What conclusion does this passage support, and what would go beyond its evidence?

2. Use “GRID EVENT” and “SINGLE-POINT RISK” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 3 • WEEK 9 • SYSTEM FAILURE: BLACKOUT

Write & communicate

Evidence desk • Read these alongside the passage.

GRID EVENT: At 02:14 the facility bus voltage falls sharply. Two critical loads transfer to backup power, while one ventilation controller fails to transfer.

PRESSURE DATA: A pressure sensor reports a sudden 40% drop at 02:15, but a second independent sensor on the same line reports only a 6% drop. The disagreement weakens confidence in the first reading.

PROCESS TANK: The tank temperature begins rising six minutes after ventilation fails. No evidence yet shows a chemical runaway; reduced heat removal is a competing explanation.

BIOLOGICAL CULTURE: Culture conditions drift out of range later in the event after temperature control and aeration become unstable. This timing is consistent with a downstream effect.

DATA NETWORK: Some monitoring packets arrive 8–12 minutes late during the blackout. Timestamp order must therefore be checked before inferring causation from dashboard display order.

SINGLE-POINT RISK: The failed ventilation controller has one power-transfer module and no independent fallback path. It is a plausible single point of failure.

Your writing brief

Write a technical incident report. Compare two hypotheses, use four evidence items, prioritise two interventions and identify a diagnostic test and residual risk.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 3 • WEEK 9 • SYSTEM FAILURE: BLACKOUT

Maths & reasoning

Worked example

A result changes from 45% to 60%. Find the percentage-point change AND relative percentage increase.

$60 - 45 = 15$ points. Relative change = $15 \div 45 \times 100$. These measures answer different questions. Answer: 15 percentage points; 33.3% relative increase.

1. A result changes from 45% to 60%. Find the percentage-point change AND relative percentage increase.

2. A result changes from 25% to 40%. Find the percentage-point change AND relative percentage increase.

3. Two angles in a triangle are 50° and 40° . Find the third and explain.

4. A stall has fixed costs \$30, unit cost \$5, and price \$10. Find revenue and profit for 20 sales.

5. Data: 6, 8, 8, 10, 13. Find the mean, median and range.

6. A learner gives this answer: “15 percentage points; 75.0% relative increase.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A result changes from 20% to 35%. Find the percentage-point change AND relative percentage increase.

7. One pressure sensor reports a 40% drop while an independent sensor reports a 6% drop. How many percentage points apart are the readings?

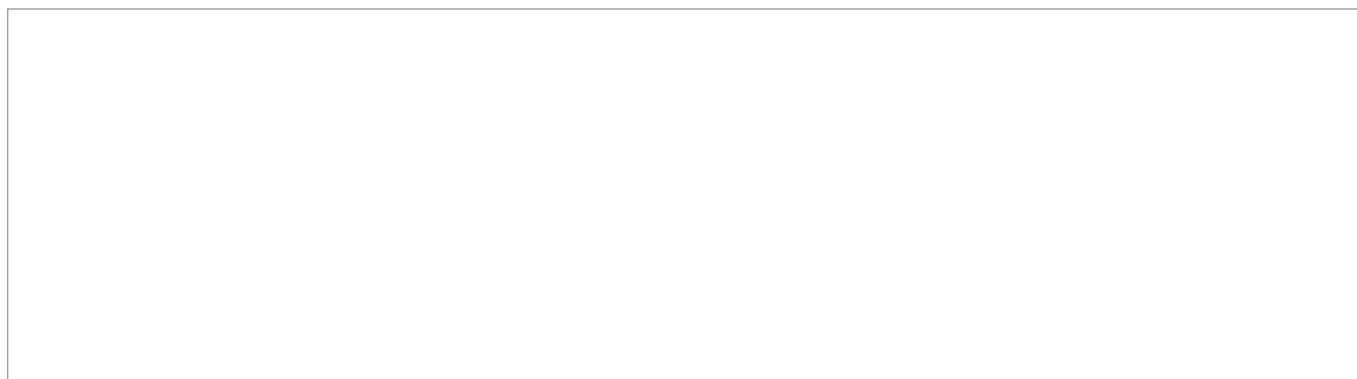
TERM 3 · WEEK 9 · SYSTEM FAILURE: BLACKOUT

Apply & reflect

Make thinking visible

Draw a labelled system model with at least four parts and arrows showing interactions. Mark a possible failure point, its downstream effect and one proposed improvement. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.



Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Finish the paper project and write a qualified conclusion. Reflect on one next step.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

TERM 3 · REVIEW AND PROJECT SHOWCASE

Pause, check, improve

1. Summarise the most important idea from this term in your own words.

2. Choose two weeks. Explain a connection between their evidence or systems.

3. Correct one maths error. Show the original misconception and a reliable method.

4. Present your paper project: central claim, strongest evidence and a limitation.

5. What changed after a counterpoint, test or feedback? Give a specific example.

6. Set one achievable next step. What support or strategy will help?

TERM 4 • PLAN YOUR INQUIRY

MAKE YOUR MOVE

What can I create, improve or start — and how do I turn an idea into something real?

Turn an idea into a tested creation, service, campaign, digital experience, community solution or venture.

The nine-week route

1. Creator Studio: Identity
2. Founder Lab
3. Make the Numbers Work
4. Future Tech
5. My Future
6. Prototype: Systems
7. Real-World Challenge
8. Pitch & Portfolio
9. Launch: Next Chapter

Project question:

Audience and purpose:

What I already know / what I need to find out:

Read & investigate

Identity is not a shortcut for visual style

Creators make choices about who is visible, what is emphasised, which voices are heard and what context is supplied. Those choices shape meaning. A 20-second social video may rely on rapid sequence and contrast, while a gallery work can reward slower viewing and an audio piece can foreground voice, silence and pacing. Identity-related work requires additional care because symbols, stories and language may have cultural histories that cannot be reduced to decoration.

Teaching note

Year 8 creation adds CONTEXT + REPRESENTATION + CRITIQUE. A creative decision is not complete when it looks effective; ask what it implies, whose perspective it centres and how another audience might read it. Cultural symbols can carry whakapapa, tikanga, community meaning or restrictions. Responsible creators research context and seek appropriate guidance or permission rather than using culture as a style library.

1. Identify the main claim or problem. Give one detail that helps a reader understand it.

2. Use “CONTEXT SHIFT” and “AESTHETIC CLAIM” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 4 • WEEK 1 • CREATOR STUDIO: IDENTITY

Write & communicate

Evidence desk • Read these alongside the passage.

- CONTEXT SHIFT: The same image can read differently on a gallery wall, in a fast social-video sequence or beside a spoken personal narrative.
- REPRESENTATION: A fictional campaign uses one character to represent an entire community. The choice risks turning a complex group into one simplified image.
- CULTURAL CONTEXT: A design note records where a culturally significant element comes from and says consultation is required before use.
- AESTHETIC CLAIM: “If the audience likes the look, context does not matter.” Popularity does not remove responsibility for meaning or representation.

Your writing brief

Write a creative-director brief. Explain audience and medium, a representation risk, a cultural-responsibility check and a change after critique.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 4 · WEEK 1 · CREATOR STUDIO: IDENTITY

Maths & reasoning

Worked example

A count rises from 200 to 250. Find the percentage increase.

Increase $\div$ original $\times 100 = 50 \div 200 \times 100 = 25\%$. Answer: 25%

1. A count rises from 200 to 240. Find the percentage increase.

2. A count rises from 120 to 156. Find the percentage increase.

3. A circle has radius 5 cm. Use $\pi = 3.14$ to find circumference and area.

4. Split 45 counters in the ratio 4:5. How many belong in each group?

5. 14 pages are printed in 2 minutes at a constant rate. Find the rate and time for 42 pages.

6. A learner gives this answer: “25%” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A count rises from 100 to 125. Find the percentage increase.

7. A 90-second audio piece reserves 30% of its duration for spoken voice. How many seconds is that?

TERM 4 · WEEK 1 · CREATOR STUDIO: IDENTITY

Apply & reflect

Make thinking visible

Draw a paper design or decision plan. Label the user need, two constraints, a success criterion and a test. Show one revision that evidence might require. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Choose a focused question and a fictional audience. Record why the question matters.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

A founder should try to disprove the favourite idea

The fictional founder begins with an app idea, but the research complicates it. A small group of friends likes the concept, although that sample may not represent the wider audience. A broader anonymous survey suggests fragmented information is a real issue for many respondents. A youth worker adds that transport and cost also affect participation. The revised problem therefore needs to include uncertainty and multiple barriers rather than assuming one digital product solves everything.

Teaching note

Validation uses ASSUMPTION → QUESTION → SAMPLE → EVIDENCE → CHALLENGE → REVISED PROBLEM. Friends agreeing with a founder is not strong validation if the sample is narrow. A larger survey can still be biased if the wrong people were invited or the question leads respondents. Interviews can reveal mechanisms and barriers that a percentage alone misses. Ethical research collects only what is needed and avoids pressuring people to disclose sensitive information.

1. Summarise the passage in two sentences. Keep facts separate from opinion or inference.

2. Use “FOUNDER FRIENDS” and “SOLUTION CLAIM” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 4 • WEEK 2 • FOUNDER LAB

Maths & reasoning

Worked example

A count rises from 80 to 104. Find the percentage increase.

Increase $\div$ original $\times 100 = 24 \div 80 \times 100 = 30\%$. Answer: 30%

1. A count rises from 80 to 100. Find the percentage increase.

2. A count rises from 140 to 154. Find the percentage increase.

3. A result changes from 50% to 65%. Find the percentage-point change AND relative percentage increase.

4. A rectangle is 10 cm by 8 cm. Find its perimeter and area, with units.

5. Solve $8x + 3 = 75$. Show how you check x .

6. A learner gives this answer: “30%” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A count rises from 120 to 156. Find the percentage increase.

7. 38 of 60 fictional survey respondents report fragmented event information. Approximately what percentage is that?

TERM 4 • WEEK 2 • FOUNDER LAB

Apply & reflect

Make thinking visible

Draw a paper design or decision plan. Label the user need, two constraints, a success criterion and a test. Show one revision that evidence might require. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Define three key terms and decide what counts as convincing evidence.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

A model can be correct and still be wrong about reality

A fictional venture has \$180 in fixed costs, \$6 variable cost per unit and a \$15 selling price. Under those assumptions, each sale contributes \$9 toward fixed cost, so break-even is 20 units. If the variable cost rises to \$8, contribution falls to \$7 and break-even rises to about 26 units. The arithmetic can be correct while the overall plan still fails if demand is lower than expected or another cost has been omitted.

Teaching note

A simple model can use $\text{BREAK-EVEN UNITS} = \text{FIXED COST} \div (\text{PRICE} - \text{VARIABLE COST PER UNIT})$. The result is useful only if the assumptions are plausible. If cost changes, recalculate rather than moving another number to make the answer look better. Financial models support decisions; they do not guarantee demand, sales or success.

1. Explain a cause-and-effect relationship in the passage. Use a specific detail.

2. Use “BASE MODEL” and “DEMAND ASSUMPTION” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Write & communicate

Evidence desk · Read these alongside the passage.

BASE MODEL: Fixed cost = \$180, variable cost = \$6 per unit, price = \$15 per unit. Contribution toward fixed cost is therefore \$9 per unit.

BASE BREAK-EVEN: $\$180 \div \$9 = 20$ units. Selling 20 units covers the modelled fixed and variable costs exactly.

COST SHOCK: If variable cost rises to \$8 while price stays \$15, contribution falls to \$7 and break-even rises to about 25.7, so at least 26 whole units are needed.

DEMAND ASSUMPTION: The model does not prove 26 customers will buy. Demand remains an assumption requiring separate evidence.

Your writing brief

Evaluate a financial model. Show break-even assumptions, explain a cost shock and recommend evidence needed before committing resources.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

Maths & reasoning

Worked example

Fixed costs are \$48; price is \$7; unit cost is \$2. Find the minimum whole sales to break even.

Contribution = \$5; $48 \div 5 = 9.6$. Round UP to whole sales. Answer: 10 sales.

1. Fixed costs are \$48; price is \$11; unit cost is \$6. Find the minimum whole sales to break even.

2. Fixed costs are \$84; price is \$8; unit cost is \$3. Find the minimum whole sales to break even.

3. One notebook costs \$1.23. Find the cost of 5, then the change from \$10.

4. Convert 6.2 kg to grams, then find the mass of one of 5 equal portions.

5. Convert 9.4 kg to grams, then find the mass of one of 5 equal portions.

6. A learner gives this answer: “15 sales.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. Fixed costs are \$72; price is \$7; unit cost is \$2. Find the minimum whole sales to break even.

7. Fixed cost is \$180, price is \$15 per unit and variable cost is \$6 per unit. How many units are required to break even?

TERM 4 · WEEK 3 · MAKE THE NUMBERS WORK

Apply & reflect

Make thinking visible

Draw a paper design or decision plan. Label the user need, two constraints, a success criterion and a test. Show one revision that evidence might require. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Collect three relevant details from the printed weekly sources; label their origins.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Future-ready does not mean automate everything

A fictional team uses an AI tool to summarise anonymous feedback and then checks the summary against the source comments. That is different from asking the same tool to make a final high-impact decision about a person. It is also different from sending private identifiable data to an unapproved service. Responsible technology design asks what the task is, what data is required, what happens if the system is wrong and who remains accountable for the outcome.

Teaching note

Use PURPOSE → DATA → RISK → TOOL → HUMAN CHECK → MONITOR. AI can assist with pattern-finding, drafting or summarising when the source data and output can be checked. High-impact decisions should not be handed to an opaque automated output without accountable human judgement. Sensitive or identifiable data should not be uploaded to an unapproved tool simply because automation is convenient. A good future-tech decision can be “do not automate this part.”

1. Which detail would you put first in a summary, and why? Explain its importance.

2. Use “LOWER-RISK ASSISTANCE” and “AUTOMATION CLAIM” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Write & communicate

Evidence desk • Read these alongside the passage.

LOWER-RISK ASSISTANCE: A fictional tool summarises anonymised feedback, and a person checks the summary against the original comments before using it.

HIGH-IMPACT DECISION: A proposed workflow asks a model to make the final decision about who receives a major opportunity. The decision has significant consequences and needs accountable human judgement.

DATA RISK: A proposed workflow uploads identifiable private information to a tool with no approved data-handling process.

AUTOMATION CLAIM: “If AI is faster, using it must be better.” Speed is one criterion and does not settle accuracy, fairness, privacy, energy use or accountability.

Your writing brief

Evaluate an AI-assisted workflow. Identify suitable tasks, a data risk, a human-review rule and an efficiency-versus-consequence trade-off.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

Maths & reasoning

Worked example

A count rises from 120 to 138. Find the percentage increase.

Increase $\div$ original $\times 100 = 18 \div 120 \times 100 = 15\%$. Answer: 15%

1. A count rises from 120 to 132. Find the percentage increase.

2. A count rises from 180 to 216. Find the percentage increase.

3. A bag has 4 red and 6 blue tokens. A token is chosen at random. Find P(red) and P(not red).

4. A count rises from 160 to 184. Find the percentage increase.

5. One notebook costs \$1.28. Find the cost of 5, then the change from \$10.

6. A learner gives this answer: “15%” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A count rises from 160 to 184. Find the percentage increase.

7. A human-review rule flags 25% of 80 cases. How many cases are sent for review?

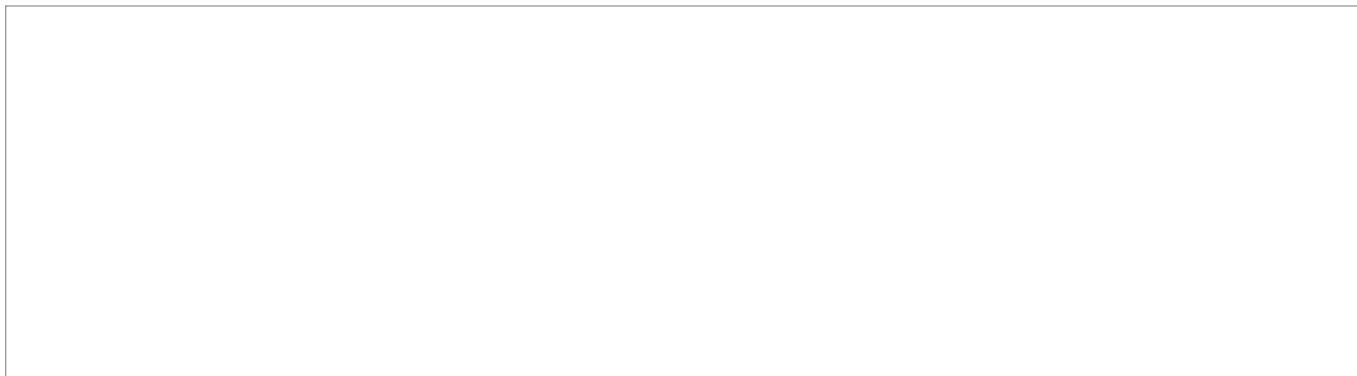
TERM 4 · WEEK 4 · FUTURE TECH

Apply & reflect

Make thinking visible

Draw a paper design or decision plan. Label the user need, two constraints, a success criterion and a test. Show one revision that evidence might require. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.



Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Draft a diagram, table or outline. Mark a claim that needs checking.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

A direction can matter without becoming your identity

Year 8 students are often asked what they want to do in the future before they have had the chance to try many possibilities. A useful vision board keeps options visible rather than forcing certainty. One image might represent a skill, a place, a kind of work, a relationship or a contribution. The next step is not to promise a future; it is to choose one action that produces more information about what fits.

Teaching note

Use VISION → GOAL → STEPS → ACTION → REVIEW. A vision can be broad: something you want to experience, learn, contribute or build. A goal narrows one part into something measurable. The first action should be small enough to schedule. Reviewing a goal is not failure; new evidence can justify keeping, revising or dropping it.

1. What is the writer trying to help the reader understand? Support your answer with a detail.

2. Use “VISION” and “MAGICAL CLAIM” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Write & communicate

Evidence desk • Read these alongside the passage.

VISION: “I want to become more confident creating and sharing digital work” is a direction, not yet a measurable goal.

GOAL: “Complete two 25-minute practice sessions each week for six weeks” has a frequency, duration and review point.

SUPPORT: A realistic plan can include whānau, kaiako, peers, libraries, clubs, online learning or other appropriate support/resources.

MAGICAL CLAIM: A vision board does not make an outcome happen by itself; action, opportunity, support and changing circumstances still matter.

Your writing brief

Turn a fictional or personal interest into a measurable goal. State first steps, support, a barrier and a review point. You may keep all details fictional.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 4 • WEEK 5 • MY FUTURE

Maths & reasoning

Worked example

24 pages are printed in 4 minutes at a constant rate. Find the rate and time for 72 pages.

Divide amount by time to get the unit rate. Triple the pages means triple the time at the same rate. Answer: 6 pages/min; 12 minutes.

1. 18 pages are printed in 3 minutes at a constant rate. Find the rate and time for 54 pages.

2. 45 pages are printed in 5 minutes at a constant rate. Find the rate and time for 135 pages.

3. A map uses 1 cm : 15 km. Two places are 5 cm apart on the map. Find the actual distance.

4. Sequence: 4, 12, 20, 28. Give the next two terms and a rule for term n .

5. A fictional vehicle travels 18 km at a steady 9 km/h. Find the time in hours and minutes.

6. A learner gives this answer: "8 pages/min; 12 minutes." to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. 32 pages are printed in 4 minutes at a constant rate. Find the rate and time for 96 pages.

7. You plan two 25-minute sessions each week for 6 weeks. How many total minutes of practice is that?

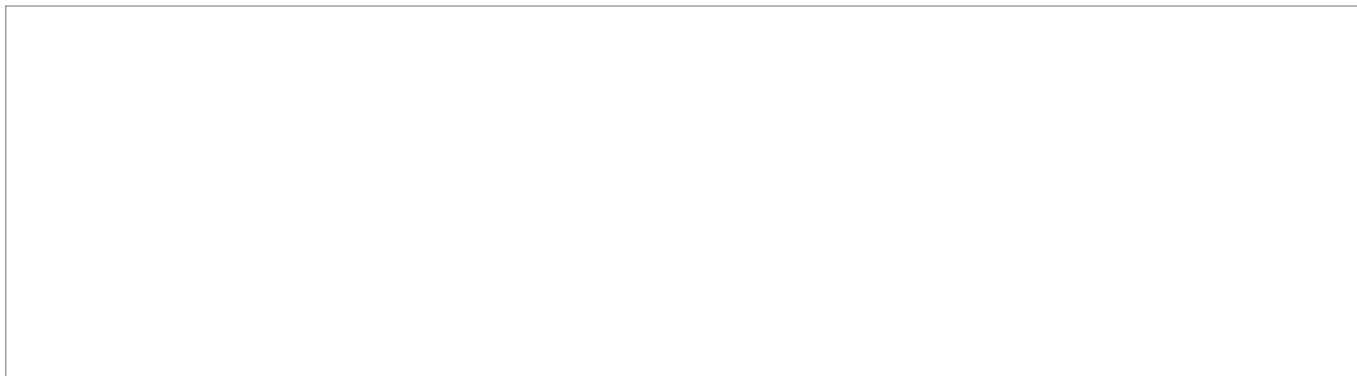
TERM 4 • WEEK 5 • MY FUTURE

Apply & reflect

Make thinking visible

Draw a paper design or decision plan. Label the user need, two constraints, a success criterion and a test. Show one revision that evidence might require. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.



Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Add a numerical comparison and explain its context. Check units and denominators.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Reliable systems are tested when the easy path breaks

A prototype that succeeds once under perfect conditions may still be fragile. Reliability testing repeats the task, introduces realistic faults and records failures as evidence. In a monitoring system, a second sensor can improve resilience if it is independent enough to detect disagreement. Adding redundancy can also increase cost, complexity or power use, so the redesign still requires a trade-off.

Teaching note

Use SPECIFICATION → NORMAL TEST → FAULT TEST → DATA → WEAK DEPENDENCY → REVISION → RETEST. Reliability asks how consistently the system meets criteria, including when something goes wrong. A backup is stronger when it is sufficiently independent from the component it protects. Keep failed trials in the evidence.

1. Explain a contrast or tension in the passage. Refer to both sides.

2. Use “CRITERIA” and “CHERRY-PICK” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Evidence desk · Read these alongside the passage.

CHERRY-PICK: Removing the 4% trial because it makes the average look worse hides relevant reliability evidence.

Your writing brief

Write a systems test report. Summarise normal and fault results, use the mean, explain a dependency and evaluate the cost of a redesign.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 4 • WEEK 6 • PROTOTYPE: SYSTEMS

Maths & reasoning

Worked example

Data: 7, 9, 9, 11, 14. Find the mean, median and range.

Mean = total $\div$ 5; median is the middle ordered value; range = maximum – minimum. Answer: Mean 10; median 9; range 7.

1. Data: 7, 9, 9, 11, 14. Find the mean, median and range.

2. Data: 3, 5, 5, 7, 10. Find the mean, median and range.

3. 18 pages are printed in 3 minutes at a constant rate. Find the rate and time for 54 pages.

4. A map uses 1 cm : 30 km. Two places are 9 cm apart on the map. Find the actual distance.

5. Calculate $5/7 \div 1/4$. Give a simplified fraction.

6. A learner gives this answer: “Mean 12; median 11; range 7.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. Data: 9, 11, 11, 13, 16. Find the mean, median and range.

7. Four sensor-error trials are 1%, 2%, 1% and 4%. What is the mean error?

TERM 4 · WEEK 6 · PROTOTYPE: SYSTEMS

Apply & reflect

Make thinking visible

Draw a paper design or decision plan. Label the user need, two constraints, a success criterion and a test. Show one revision that evidence might require. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Write a fair counterpoint. Identify a gap or voice the project does not represent.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

TERM 4 • WEEK 7 • REAL-WORLD CHALLENGE

Read & investigate

A serious recommendation includes the strongest reason it could be wrong

Te Awa Bay is fictional, but the decision structure is realistic. More parking supports drivers, a safe active link can serve many short trips, and a shuttle can improve access for people who cannot walk, cycle or drive. Each option creates costs and exclusions of its own. A strong recommendation therefore includes a counter-argument, uncertainty and a monitoring plan rather than pretending one option is perfect.

Teaching note

Use STAKEHOLDERS → CRITERIA → EVIDENCE → OPTIONS → RISK → COUNTER-ARGUMENT → RECOMMENDATION. Risk combines likelihood and consequence; both can be uncertain. Optimisation does not mean choosing the biggest number. It means selecting the option or combination that best fits the stated priorities and constraints.

1. Identify one explicit fact and one reasonable inference. Explain the evidence for the inference.

2. Use “OPTION A” and “CERTAINTY CLAIM” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 4 · WEEK 7 · REAL-WORLD CHALLENGE

Write & communicate

Evidence desk · Read these alongside the passage.

- OPTION A: More car parking: estimated \$420k, strong car access, removes green space and does little for people who cannot drive.
- OPTION B: Safe walk/cycle link: estimated \$310k, broad active-access benefit, lower operating cost, but weather and mobility needs remain.
- OPTION C: Small electric shuttle: estimated \$520k, strong accessibility potential, but requires ongoing staffing, charging and service reliability.
- CERTAINTY CLAIM: “The cheapest option is automatically the best.” Cost is one criterion and does not settle access, safety or long-term operation.

Your writing brief

Recommend an option for the real-world case. Balance three criteria, a quantitative comparison, stakeholder impact and the strongest counter-argument.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 4 • WEEK 7 • REAL-WORLD CHALLENGE

Maths & reasoning

Worked example

A count rises from 180 to 234. Find the percentage increase.

Increase $\div$ original $\times 100 = 54 \div 180 \times 100 = 30\%$. Answer: 30%

1. A count rises from 180 to 225. Find the percentage increase.

2. A count rises from 100 to 110. Find the percentage increase.

3. A count rises from 160 to 192. Find the percentage increase.

4. Fixed costs are \$36; price is \$11; unit cost is \$6. Find the minimum whole sales to break even.

5. Two angles in a triangle are 55° and 65° . Find the third and explain.

6. A learner gives this answer: “30%” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A count rises from 80 to 104. Find the percentage increase.

7. Option B costs \$310k and Option C costs \$520k. Approximately how much more expensive is C than B as a percentage of B?

TERM 4 · WEEK 7 · REAL-WORLD CHALLENGE

Apply & reflect

Make thinking visible

Draw a paper design or decision plan. Label the user need, two constraints, a success criterion and a test. Show one revision that evidence might require. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Make a draft page or paper prototype. Ask someone to comment, or use the checklist yourself.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

Defence is not denial

A strong capstone can still have weaknesses. The purpose of a challenge question is to test whether the presenter understands those weaknesses and can reason about them. Portfolio evidence helps because it shows how the idea changed over time. When a number is used, the audience should know what it measures. When a limitation is real, naming it is usually stronger than trying to talk around it.

Teaching note

Use CLAIM → EVIDENCE TRAIL → TRADE-OFF → CHALLENGE → RESPONSE → NEXT TEST. A portfolio should make thinking visible, not just display polished outcomes. In a defence, first answer the actual question. Then use the relevant evidence, name the limit and explain why the decision is still reasonable or what you would change.

1. Suggest a more precise alternative title. Explain how it represents the passage accurately.

2. Use “PROCESS EVIDENCE” and “POLISH ONLY” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

Write & communicate

Evidence desk · Read these alongside the passage.

PROCESS EVIDENCE: An early draft beside a revision note can show why the final design changed.

TEST EVIDENCE: A result, user response, cost model or comparison can support the reason for a revision.

NUMERICAL CONTEXT: A percentage is clearer when the audience knows the sample, units or baseline it came from.

POLISH ONLY: A final screenshot with no explanation does not show how evidence affected the decision.

Your writing brief

Write a pitch and defence. Include evidence with context, a trade-off, the strongest challenge question and a reasoned response.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

Maths & reasoning

Worked example

A count rises from 200 to 220. Find the percentage increase.

Increase $\div$ original $\times 100 = 20 \div 200 \times 100 = 10\%$. Answer: 10%

1. A count rises from 200 to 260. Find the percentage increase.

2. A count rises from 120 to 138. Find the percentage increase.

3. Temperature starts at -8°C , rises 7°C , then falls 10°C . What is it now?

4. One notebook costs \$1.45. Find the cost of 5, then the change from \$10.

5. A count rises from 160 to 192. Find the percentage increase.

6. A learner gives this answer: “10%” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. A count rises from 100 to 110. Find the percentage increase.

7. A prototype completion time drops from 50 seconds to 38 seconds. What is the percentage decrease?

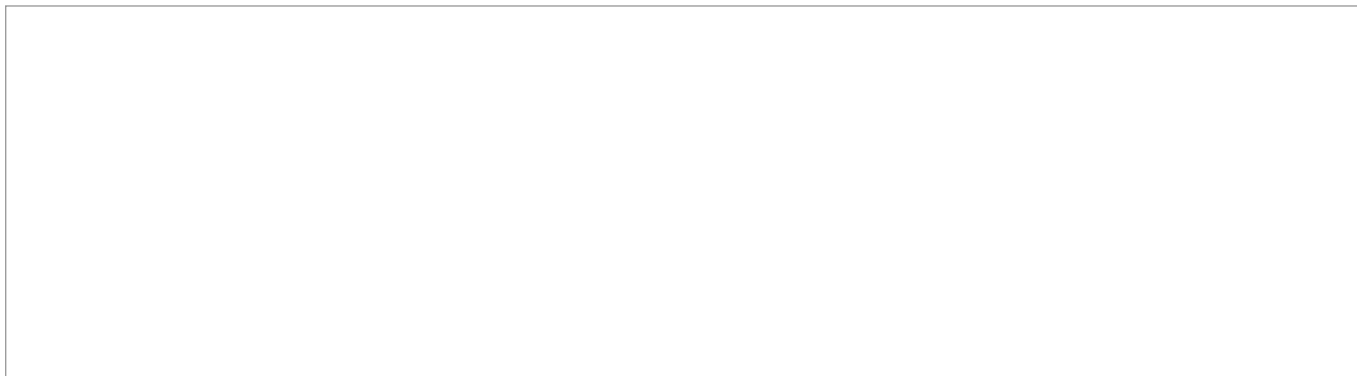
TERM 4 · WEEK 8 · PITCH & PORTFOLIO

Apply & reflect

Make thinking visible

Draw a paper design or decision plan. Label the user need, two constraints, a success criterion and a test. Show one revision that evidence might require. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.



Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Revise one choice in response to evidence or feedback. Record before and after.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

Read & investigate

The next chapter does not require a finished identity

The end of Year 8 is a transition, not a final answer about who you are. The useful question is what you can carry forward: ways to investigate claims, plan work, use maths, test designs, communicate decisions and seek support. A future direction can guide action now without becoming a promise about adulthood. Reviewing and changing a goal is part of learning from evidence.

Teaching note

Use SYNTHESISE → LAUNCH → REVIEW → CHOOSE → ACT. High-school readiness is not knowing everything before you arrive. It includes organising work, using evidence, choosing strategies, asking for help, revising plans and taking a next action. Goals can change. Agency includes deciding that an old goal no longer fits.

1. What conclusion does this passage support, and what would go beyond its evidence?

2. Use “CAPSTONE” and “FIXED FUTURE” on the next page. Explain how they support, challenge or qualify each other.

3. Choose an important subject word from the passage or teaching note. Explain its meaning in context and use it accurately in a new sentence.

4. Write one useful question that the evidence does not answer. Explain what additional information would help.

TERM 4 · WEEK 9 · LAUNCH: NEXT CHAPTER

Write & communicate

Evidence desk · Read these alongside the passage.

CAPSTONE: A final presentation should connect the original problem to evidence, testing, revision, trade-offs and the current recommendation.

VISION REVIEW: A Week 5 goal can be kept, revised or dropped if the learner now has better information.

NEXT ACTION: A small action with a timeframe and support route is more actionable than “try harder next year”.

FIXED FUTURE: “Choosing a goal at 12 or 13 means you should never change direction.” Future plans remain revisable.

Your writing brief

Write a launch note and reflection. Explain one evidence-led revision, a trade-off, a goal review and a concrete next action with support.

Plan: audience / main claim / evidence / limitation

Draft and revise (continue in your exercise book if needed).

Check: ☐ clear purpose ☐ evidence ☐ linked ideas ☐ precise words ☐ punctuation

TERM 4 • WEEK 9 • LAUNCH: NEXT CHAPTER

Maths & reasoning

Worked example

One notebook costs \$1.26. Find the cost of 5, then the change from \$10.

Multiply the unit cost by quantity. Check the decimal place; subtract from \$10. Answer: Cost \$6.30; change \$3.70.

1. One notebook costs \$1.25. Find the cost of 5, then the change from \$10.

2. One notebook costs \$1.42. Find the cost of 5, then the change from \$10.

3. A rectangle is 14 cm by 8 cm. Find its perimeter and area, with units.

4. A triangle has base 10 cm and perpendicular height 6 cm. Find its area.

5. A triangle has base 16 cm and perpendicular height 8 cm. Find its area.

6. A learner gives this answer: “Cost \$7.30; change \$2.70.” to the following task. Show a different checking method, or a diagram, and explain whether it is reasonable. One notebook costs \$1.46. Find the cost of 5, then the change from \$10.

7. A student has 6 hours available across a week and allocates 2.5 hours to study, 1.5 hours to a project and the rest to other planned commitments. How many hours remain?

TERM 4 · WEEK 9 · LAUNCH: NEXT CHAPTER

Apply & reflect

Make thinking visible

Draw a paper design or decision plan. Label the user need, two constraints, a success criterion and a test. Show one revision that evidence might require. Add an alternative explanation or design and explain what evidence would help you choose between them.

Draw, label or make a table here.

Make a defensible decision

Use the printed case to recommend a next step. State a choice, two supporting details and a limitation. Explain what evidence would make you revise the choice.

This week's paper project step

Finish the paper project and write a qualified conclusion. Reflect on one next step.

Reflect: What did you change after checking evidence, calculations or feedback?

Self-check: ☐ I explained why. ☐ I checked units/sources. ☐ I named uncertainty.

TERM 4 · REVIEW AND PROJECT SHOWCASE

Pause, check, improve

1. Summarise the most important idea from this term in your own words.

2. Choose two weeks. Explain a connection between their evidence or systems.

3. Correct one maths error. Show the original misconception and a reliable method.

4. Present your paper project: central claim, strongest evidence and a limitation.

5. What changed after a counterpoint, test or feedback? Give a specific example.

6. Set one achievable next step. What support or strategy will help?
