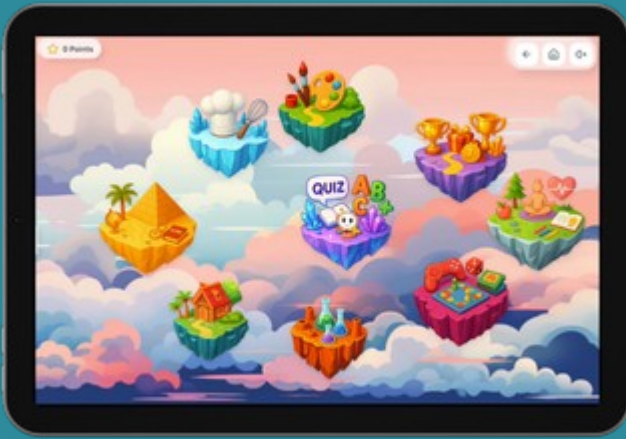


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Built to Survive - Year 5

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Teacher Overview

Essential question: How do structures and behaviours help living things survive?

Teach a full ten-lesson route, or the reviewed eight-session route below. Each meeting is about 60 minutes. All ten separate editable lesson decks are included. Compact sessions select teaching slides from compatible pairs; do not play two full decks end-to-end. The complete assessment finishes by compact session 8.

Students connect real plant and animal features with their environment, function and reliable evidence. Platypus is the main animal case; angular pigface is the plant comparison; red kangaroo provides additional behaviour and transfer evidence. Every species function is bounded by its source. A helpful adaptation does not guarantee survival.

Use D1/D2, eight case cards, the cooperative game, eleven worksheets, cards with matched answers, the quiz and two-page assessment/rubric. Worksheets record reasoning; they do not replace practical exploration, discussion or source interpretation. Red answers are examples where responses are open.

Offer spoken, drawn, written, gestural, picture, symbol, communication-board/device or adult-scribed responses. Provide two cards at a time, read sources aloud and rehearse a source-chain sentence. Keep the same content and evidence expectation. Extension adds corroboration, an uncertainty or a transfer exploration, rather than extra copying.

Do not infer behaviour from appearance, describe a bill as a battery, imply individuals choose new adaptations, or present classroom cups as animals or Taronga research. No live-animal stress, trapping, handling or demonstration or student water entry is required.

Lesson Files 1-5

Each file contains its own complete teaching sequence and closing slide. All are available for the full route.

Lesson 1: Survival questions

Built to Survive - Year 5 - Lesson 01 - Presentation.pptx

Lesson 2: Structural features

Built to Survive - Year 5 - Lesson 02 - Presentation.pptx

Lesson 3: Behaviour matters

Built to Survive - Year 5 - Lesson 03 - Presentation.pptx

Lesson 4: Compare environments

Built to Survive - Year 5 - Lesson 04 - Presentation.pptx

Lesson 5: Evidence versus story

Built to Survive - Year 5 - Lesson 05 - Presentation.pptx

PREVIEW

Lesson Files 6-10

Each file contains its own complete teaching sequence and closing slide. All are available for the full route.

Lesson 6: Investigate a model

Built to Survive - Year 5 - Lesson 06 - Presentation.pptx

Lesson 7: Interpret limits

Built to Survive - Year 5 - Lesson 07 - Presentation.pptx

Lesson 8: Build the comparison

Built to Survive - Year 5 - Lesson 08 - Presentation.pptx

Lesson 9: Survival-science conference

Built to Survive - Year 5 - Lesson 09 - Presentation.pptx

Lesson 10: Conservation application

Built to Survive - Year 5 - Lesson 10 - Presentation.pptx

PREVIEW

Eight-Session Route – Sessions 1-4

Each session: retrieval 5 min; explicit source/model 10 min; guided-to-independent application 30 min; evidence explanation/conference 10 min; cleanup 5 min. Prepare materials before class.

1. Lessons 01 + 02: Survival questions and structural features. Use L01 slides 1–3, 5 and 9; L02 slides 5, 7–9 and 12. One opening and closing. Compare the same plant/animal cases; combine W01/W02 responses where this avoids duplication. Collect a source question, two structure/function links and a real collaboration explanation.

2. Lesson 03: Behaviour matters. Use its complete deck and W03. Clarify structures and sourced actions; include a plant growth response without invented action. Collect an explained classification and correction of conscious growth.

3. Lesson 04: Compare environments. Use its complete deck and W04. Refine W06a planning. Compare the same criteria, frame a safe model question, identify controls and a risk/care choice. Collect a bounded habitat comparison and fair-test plan.

4. Lesson 05: Evidence versus story. Use its complete deck and W05; refine W06a. Evaluate source claims and prepare the repeatable cup method decision. Collect repaired explanations, planned independent repeats and an appropriate measurement unit.

Maintain all essential learning. Sessions are teaching meetings, not a requirement to complete the unit on eight consecutive days. Card selection, response mode and amount of recording may vary; the reasoning criteria do not.

Eight-Session Route – Sessions 5-8

5. Lesson 06: Investigate a model. Use its complete deck and W06a/b. Carry out the safe comparison or explicitly identified secondary/illustrative interpretation alternative. Keep independent trials and actual variation. Collect method reasoning, measurements/representation and origin labels.

6. Lesson 07: Interpret limits. Use its complete deck and W07. Interpret measured or visibly illustrative data, evaluate errors and explain model limits. Revisit real scientific collaboration. Collect a supported conclusion, method improvement and expertise explanation.

7. Lesson 08: Build the comparison. Use its complete deck, W08 and A1 page 1. Develop the existing portfolio, including a plant structure, animal structure/behavior, resource chain and safe community decision. Collect a ready comparison and notes; do not start a new project from nothing.

8. Lessons 09 + 10: Survival explanation and conservation. Use one opening/learning focus from L09; selected L09 slides 4–10 and L10 slides 1–3, 10–11 as needed. During the 30-minute application block, students defend the comparison, a habitat-change response, explain real collaboration, and recommend safe care using W09/W10 or A1 page 2. Teacher combines brief paired/small-group explanations with saved portfolio evidence.

Complete every assessment criterion by session. For large classes collect short accessible recordings, oral-to-adult, labelled drawing or supported-choice evidence during the task block; do not require every student to give a public speech in ten minutes. Optional larger sharing is not essential. The quiz is an additional check, not the sole assessment.

Safe Physical Model – Teacher Method

Question: Does adding a felt sleeve change how quickly cool water warms? This is an original classroom material comparison. It does not test real animal survival, metabolism or evolution.

Prepare six identical plastic cups, a tray, 300 mL cool water, measuring jug, timer, suitable digital thermometers, three matching felt sleeves and large clips. Teacher checks that cool water begins below room temperature so warming can be observed; cool or teacher-prepared chilled water only. No flame, heating, boiling water, glass thermometer or student-operated appliance. Check material sensitivities; use a suitable wool-free covering when needed.

Label W1–W3 wrapped and U1–U3 unwrapped. Pour 50 mL per cup from the jug. Use similar starts. Wrap the same side height and thickness, leaving every top open. Keep cup type, volume, location, exposure and observation intervals comparable. Three cups per condition provide independent trials; do not copy the trials three.

Record at 0, 5 and 10 minutes to the nearest 1 °C. Use equal probe depth and a consistent reading routine. Several groups may each manage a pair and share their honest records. Rotate observer, measurer, recorder/timer and reviewer roles; students may explain without handling equipment.

Keep water away from power, walk around tray and dry spills promptly. Empty water safely and dry/store equipment. If starts differ, report that limitation or restart safely; never alter readings to fit a prediction. No change is valid. Retain raw trials before choosing a representative graph.

Interpret temperature rise under the actual conditions. A covering may alter heat transfer; results do not prove a particular organism survives. If testing is unsuitable, label W07 as illustrative practice and other planning/safety/method reasoning separately. Do not claim students collected those values.

Evidence Trail – Teacher Criteria

Use G1a rules, G1b board and eight G1c challenges with C1–C8. Cooperative groups of 2–4 use large counters or point. Every student explains; partner-supported, drawn or device-supported responses are welcome. No chance score, time pressure or elimination.

1. C1: Webbed feet are a structure; swimming is the function; freshwater is the context. A reliable source supports the link.
2. C2: Bill receptors detect electrical signals from moving prey. The bill is not a battery or human eye.
3. C1/C3: Webbing is a structure; folding it on land is an action. Its large context and use of claws matter.
4. C5: Trailing pigface stems root at nodes; spreading growth helps bind loose dune sand.
5. C7/C8: Accept moisture from eating grasses in drought to detail use for counterbalance/support in the relevant movement. Cite a matching source.
6. No conscious choice of new webbing. Inherited adaptations are shaped over generations, not during a lesson.
7. A slower-warming felt cup can support a cover effect under its conditions. It cannot establish living-animal survival, reverse fur effects or evolution.
8. Accept a safe, sourced habitat care action, such as teacher-approved litter prevention. Explain likely effect and uncertainty, trapping, wildlife handling or water entry.

Ask for claim, evidence and evidence when one respectful question. Correct a factual misconception on the relevant card and allow a revised response. Board artwork is original illustration, not data observation or proof.

Lesson I – Survival questions

Focus: Connect an organism, an environmental challenge and a helpful feature. Ask a question that evidence can answer.

Materials/resources: D1, D2, C1–C8 and W01.

8 min — Retrieve: A platypus lives in freshwater. Look at its broad front feet and bill. What can you observe? What needs a source? Elicit reasoning before giving the answer.

12 min — Explicit model/source: Ask what is observable in an illustration and what requires a source. Model a freshwater challenge → webbing → swimming chain.

25 min — Guided then independent application: Students choose an organism to frame a source question and a safe model question, and justify a prediction.

10 min — Evidence explanation: Collect an organism–environment link and a reasoned question; accept a drawing with spoken explanation.

5 min — Exit/cleanup: Which part of your explanation is observed, sourced or predicted? Name the organism, challenge and evidence. A question about interfering is replaced with a safe model or source question. Return materials safely; keep selected evidence.

Access/challenge: Scribe a two-card response, extend by naming evidence that would change a claim.

Deck: Built to Survive - Year 5 - Lesson 1 - Presentation.pptx

Full route: use all 12 slides with substantial talk time. Compact route: use the mapping above; retain this lesson's learning and evidence.

Lesson 2 – Structural features

Focus: Explain how a sourced structural feature helps survival in a particular environment. Compare a plant and an animal.

Materials/resources: D1/D2, C1/C2/C5 and W02.

8 min — Retrieve: Complete: webbed feet → swimming → finding food in freshwater. Which part names a structure? Which names a function? Elicit reasoning before giving the answer.

12 min — Explicit model/source: Model the platypus foot/bill and pigface root using stem from the verified sources; do not infer all functions from appearance. Teach the reamronga partnership explicitly.

25 min — Guided then independent application: Students annotate two source-based drawings, explain environment/function and identify what different parts contribute.

10 min — Evidence explanation: Collect two accurate structure/function links and an explanation of scientific collaboration, beyond “we worked together”

5 min — Exit/cleanup: Explain one plant structure and one animal structure. Link each to the relevant challenge. How does real collaboration improve evidence, beyond working in a group? Return materials safely; keep selected evidence.

Access/challenge: Use provided labels and sources on stems; extend by distinguishing a drawing from functional evidence.

Deck: Built to Survive - Year 5 - Lesson 02 - Presentation.pptx

Full route: use all 12 slides for substantial task time. Compact route: use the mapping above; retain this lesson's learning and evidence.

Lesson 3 – Behaviour matters

Focus: Distinguish a body structure from an action. Use sourced behaviour to explain survival.

Materials/resources: C1/C3/C5/C7/C8, G1 and W03.

8 min — Retrieve: A webbed foot is a structure. Swimming is an action. A tail is a structure; using it for balance is an action. Say which evidence supports each. Elicit reasoning before giving the answer.

12 min — Explicit model/source: Contrast webbing with folding it on land; tail structure with its use. Explain pigface growth response without conscious choice.

25 min — Guided then independent application: Students sort examples explicitly sourced action and play a cooperative evidence turn.

10 min — Evidence explanation: Collect a reasoned classification and a conclusion of chosen evolution.

5 min — Exit/cleanup: Explain why “webbed feet” and “folding the webbing on land” are different kinds of example. Appearance alone is insufficient evidence of a behaviour. Return materials safely; keep selected evidence.

Access/challenge: Offer cards/picture selection and partner recording; extend by questioning evidence for an unseen behaviour.

Deck: Built to Survive - Year 5 - Lesson 3 - Presentation.pptx

Full route: use all 12 slides with substantial talk time. Compact route: use the mapping above; retain this lesson’s learning and evidence.

Lesson 4 – Compare environments

Focus: Compare environments using the same criteria. Plan a fair and safe question; avoid one-feature-fits-all claims.

Materials/resources: C1/C4/C5/C6, W04 and W06a.

8 min — Retrieve: What helps a platypus move through freshwater? Would that explanation alone justify the same feature for a dune plant? Elicit reasoning before giving the answer.

12 min — Explicit model/source: Model same-criteria freshwater/coastal-dune comparison, then distinguish source inquiry from safe testing.

25 min — Guided then independent application: Students compare conditions/features, plan one variable and controls, and name safety/care choices.

10 min — Evidence explanation: Collect context-specific explanation, a sourced model question and controls/risk plan.

5 min — Exit/cleanup: Give a sourced reason one feature helps in one environment. Name what changes, what stays the same and what you measure in your model. Return materials safely; keep selected evidence.

Access/challenge: Provide two criteria first, then challenge by identifying a confound or uncertainty in a comparison.

Deck: Built to Survive - Year 5 - Lesson 4 - Presentation.pptx

Full route: use all 12 slides with substantial talk time. Compact route: use the mapping above; retain this lesson's learning and evidence.

Lesson 5 – Evidence versus story

Focus: Check claims against sources. Reject invented intentions and improve a repeatable method.

Materials/resources: D2, C1/C2/C3, W05 and W06a.

8 min — Retrieve: “The platypus wanted to swim, so it grew webbed feet.” Which words invent an intention? A need does not prove that an individual chose a new structure. Elicit reasoning before giving the answer.

12 min — Explicit model/source: Model why a just-so story invents intention; contrast supported function with an unsupported universal claim.

25 min — Guided then independent application: Students evaluate, repair, three claims and rehearse the repeatable method with units and precision.

10 min — Evidence explanation: Collect source judgements and explain that another group could repeat safely.

5 min — Exit/cleanup: Explain why the repaired claim is strong; give one method detail that another group would need to repeat your test. Return materials safely; keep selected evidence.

Access/challenge: Read claims aloud and allow class supported judgement; extend by differentiating contradicted from merely unproven.

Deck: Built to Survive - Year 5 - Lesson 05 - Presentation.pptx

Full route: use all 12 slides for substantial task time. Compact route: use the mapping above; retain this lesson's learning and evidence.

Lesson 6 – Investigate a model

Focus: Carry out a fair comparison of cup coverings. Record repeated temperatures and explain what the model represents.

Materials/resources: W06a/b, prepared six-cup tray and digital thermometers.

8 min — Retrieve: A felt sleeve is a physical model of a covering. A cup does not have living skin, metabolism or behaviour. This practical cannot establish what a real animal does. Elicit reasoning before giving the answer.

12 min — Explicit model/source: Show side-wrapped/open-top controls and identical-volume preparation; explain model versus organism.

25 min — Guided then independent application: Use the detailed teacher method. Students predict, carry out three independent trials per condition, record at 0.1 min and represent honest values.

10 min — Evidence explanation: Collect fair method actual records/variation, clear origin labels, representation and bounded conclusion.

5 min — Exit/cleanup: Name your variable, one control, a recorded value and a limitation. Empty water safely, dry the tray and store equipment. Cup-covering evidence is not a real-animal survival test. Return materials safely. Open selected evidence.

Access/challenge: Rotate accessible roles: explain or record without handling. Extend by documenting a possible reading error.

Deck: Built to Survive - Year 6 Lesson 6 Presentation.pptx

Full route: use all 12 slides with substantial task time. Compact route: use the mapping above; retain this lesson's learning outcome.

Lesson 7 – Interpret limits

Focus: Use tables and graphs to make a bounded conclusion. Explain method error and model limits.

Materials/resources: Own measured W06b record or labelled illustrative W07, plus W07/answer.

8 min — Retrieve: Is your table measured in class or illustrative? State the origin before drawing a conclusion. Preserve all trials, including an unusual value. Elicit reasoning before giving the answer.

12 min — Explicit model/source: Model the 4 °C versus 7 °C practice claim and why cup results cannot prove organism survival. Revisit real scientific partnership.

25 min — Guided then independent application: Students interpret a table/graph, state a method error/model limit and propose an improvement or further source question.

10 min — Evidence explanation: Collect correct origin, data, bounded conclusion, method improvement and contribution of different expertise.

5 min — Exit/cleanup: Finish: “This evidence suggests ... under these conditions. It cannot show ... because ...” Name a useful next step without handling a living thing. Return materials safely; keep selected evidence.

Access/challenge: Use supplied aids and spoken claim–evidence–limit frame; extend with variation between actual independent trials.

Deck: Built to Survive - Year 7 Lesson 7 Presentation.pptx

Full route: use all 12 slides with substantial task time. Compact route: use the mapping above; retain this lesson’s learning and evidence.

Lesson 8 – Build the comparison

Focus: Connect environment, structure, behaviour and evidence. Use the comparison to consider a community decision.

Materials/resources: C1–C8, W08 and A1 page 1.

8 min — Retrieve: Platypus: freshwater movement and prey finding. Pigface: rooting stems on coastal dunes. Which feature and function can each source support? Elicit reasoning before giving the answer.

12 min — Explicit model/source: Model environment → structure/action → function → evidence, then a safe fictional school decision.

25 min — Guided then independent application: Students draft a plant-and-animal comparison with a sourced animal behaviour, plant response, model limit and responsible care choice.

10 min — Evidence explanation: Collect a source-supported comparison and decision with uncertainty. Use prior records rather than a second source product.

5 min — Exit/cleanup: Show evidence for structure, behaviour and environment. Name your model limit and a justified safe community choice. These records become part of your assessment portfolio. Return materials safely. Keep collected evidence.

Access/challenge: Choose two cases at a time or a labelled explanation; extend by identifying missing evidence for the recommended action.

Deck: Built to Survive - Year 8 Lesson 8 Presentation.pptx

Full route: use all 12 slides with substantial task time. Compact route: use the mapping above; retain this lesson's learning and evidence.

Lesson 9 – Survival-science conference

Focus: Present and defend an evidence-based explanation. Respond to a changed-habitat question for a named audience.

Materials/resources: W09, source cards, practical/source portfolio and A1 page 2.

8 min — Retrieve: Choose two organisms: one animal and one plant. Bring C1–C8, your comparison and model record. Separate source facts, classroom results and predictions. Elicit reasoning before giving the answer.

12 min — Explicit model/source: Model a response to a drying-creek question and uncertainty about pigface sand cover.

25 min — Guided then independent application: Students explain for a named audience, answer one evidence challenge and revise a claim. Use paired record and supported conference modes.

10 min — Evidence explanation: Collect transfer, source card, model, controls/error/limit and expertise explanation; do not grade public-speaking confidence.

5 min — Exit/cleanup: Does the evidence support your explanation? What would make you revise it? Keep the final comparison and conference evidence together. Return materials safely; keep selected evidence.

Access/challenge: Allow preparation and alternative communication; extend with a justified change that would require new evidence.

Deck: Built to Survive - Year 9 Lesson 9 Presentation.pptx

Full route: use all 12 slides with substantial task time. Compact route: use the mapping above; retain this lesson's learning and evidence.

Lesson 10 – Conservation application

Focus: Recommend a safe, evidence-informed habitat-care action. Explain likely effects, uncertainty and collaboration.

Materials/resources: W10, Taronga source case, completed A1 and R1.

8 min — Retrieve: Choose one organism. Which environment and sourced feature matter? A helpful adaptation does not protect an organism from every human-caused change. Elicit reasoning before giving the answer.

12 min — Explicit model/source: Model a safe litter-prevention recommendation, probable effect and uncertainty; revisit partners and earlier findings.

25 min — Guided then independent application: Students compare fictional school options, recommend an approved action and communicate to the school environment group.

10 min — Evidence explanation: Complete portfolio/competence evidence for scientific understanding, inquiry, collaboration and community development.

5 min — Exit/cleanup: What did the evidence change in our thinking? How can responsible science help a community decide? No harmful talk is needed to explain an organism's survival needs. Return materials safely; keep selected evidence.

Access/challenge: Use a short proposal or support a choice with reasoning; extend by planning how school-ground evidence could review the action.

Deck: Built to Survive - Year 5 - Lesson 10 - Presentation.pptx

Full route: use all 12 slides for substantial task time. Compact route: use the mapping above; retain this lesson's learning and evidence.

Assessment – Teacher Guidance

Use A1 pages 1–2, R1 and the accumulated source/practical/conference records. Students compare one plant and one animal, explain a structural feature for each and one sourced animal behaviour, then link function to environmental challenge. Pigface's growth response is not a conscious choice.

Sound example: Platypus webbing helps swimming in freshwater (C1); folded webbing/claws support movement on land (C3). Angular pigface rooting stems help spreading and binding loose dune sand (C5). Sources support the functions; a drawing alone does not demonstrate them. Features do not guarantee survival.

Transfer: C6 supports possible upward growth after sand cover. Do not promise survival for every depth/timing. A dry creek cannot be fixed merely by webbed feet. Ask what evidence is missing in the new situation.

Inquiry: Check a scoped question/prediction, controlled safe repeatable plan, reasonable measurement/units, honest separate trials, a suitable representation, conclusion, method error/improvement and model limit. If using illustrative practice data, verify that the origin is explicitly stated and collect method reasoning separately.

Human endeavour: Ask why ecological/genetic and reproductive expertise and earlier findings improve real conservation explanations/decisions. A group craft or “we shared roles” alone is insufficient. Accept safe science-informed habitat-care recommendation with a supported likely effect and uncertainty.

Use brief conferences: What is your claim? Which source/result supports it? What is a meaningful limit? What makes it new case? Why is the method safe/fair? How can scientists and a community use the evidence? Record equivalent spoken, drawn, written, gestural or communication as reasoning.

Apply the four rubric dimensions using observable evidence. Support need, neatness, speed, volume and confident public performance are not achievement levels. Combine ongoing evidence with the final response; the quiz alone cannot assess inquiry. Full route closes in lesson 7, compact route closes in session 8.

Teacher Source Links and Responsible Use

The factual examples below were checked against their live official pages on 13 October 2026. Resource illustrations are original, not source photographs or dated observations. Use full official items for teacher viewing when helpful.

Taronga Zoo — Platypus

<https://www.taronga.org.au/wildlife-and-conservation/animals/detail/platypus>

Webbed feet, folded webbing on land, bill electroreceptors, freshwater habitat/food, conservation pressures and partnerships.

Australian National Botanic Gardens — *Carpobrotus glaucescens* (Purser van Steeten, 2005)

<https://www.anbg.gov.au/gnp/interns-2005/carpobrotus-glaucescens.html>

Trailing stems/rooting nodes, coastal dune sand-binding and upward growth over sand cover. Do not infer quantified water storage or add medicinal/food use advice.

Taronga Zoo — Red Kangaroo

<https://www.taronga.org.au/wildlife-and-conservation/animals/detail/red-kangaroo>

Tail counterbalance/support and moisture from grasses, change in drought. Do not claim drought is harmless.

The cup procedure and supplied practice data are original classroom models. Label actual class measurements, illustrative data and source-based claims separately. Predictions stay predictions until tested. Different expertise and other research inform science; this unit's cup comparison is not Taronga research.

No competitor resource, restricted official photograph, cultural symbol or source screenshot is reproduced. Live teaching text stays editable, and speaker notes are blank. This is a digital teaching resource; follow school safety/permission procedures for any chosen external activity.

Built to Survive – Key Ideas

Structural adaptation:

An inherited body feature that helps survival in an environment.



Behaviour:

An action; some inherited behaviours help survival.



Survival:

Staying alive and meeting needs.



Environment:

The conditions and living things around an organism.



Function:

What an adaptation does.



Evidence:

Observations or reliable sources that support a claim.



Adaptations are shaped over generations. Individuals do not choose new features during a lesson.

How We Explain Our Evidence

Year 5
Science



1 QUESTION

Does a platypus choose to grow webbed feet because it needs to swim?



2 EVIDENCE

Taronga describes webbed feet that help swimming, and webbing folded on land.



Enlarged front foot

3 EXPLANATION

No. Webbed feet are inherited features shaped over generations. They help movement in water; they are not consciously chosen.



CHECK

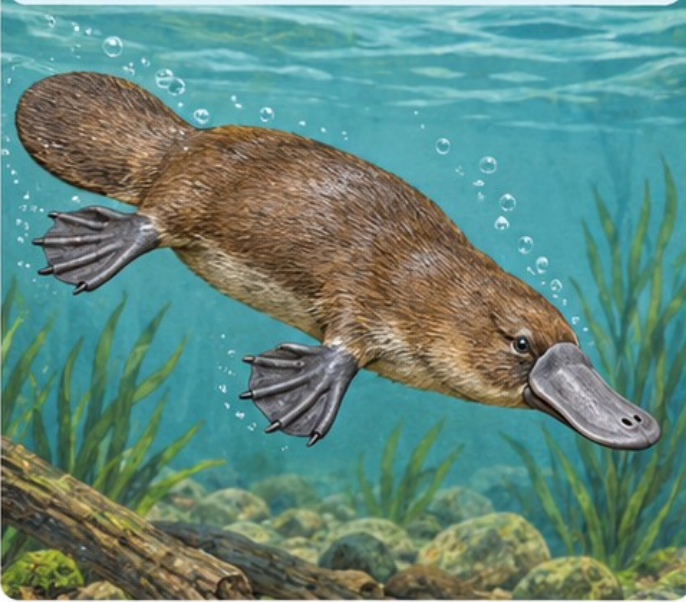
A drawing shows a feature.
A source helps explain its function.



Case and Source Cards — 1

C1 Swimming structure:

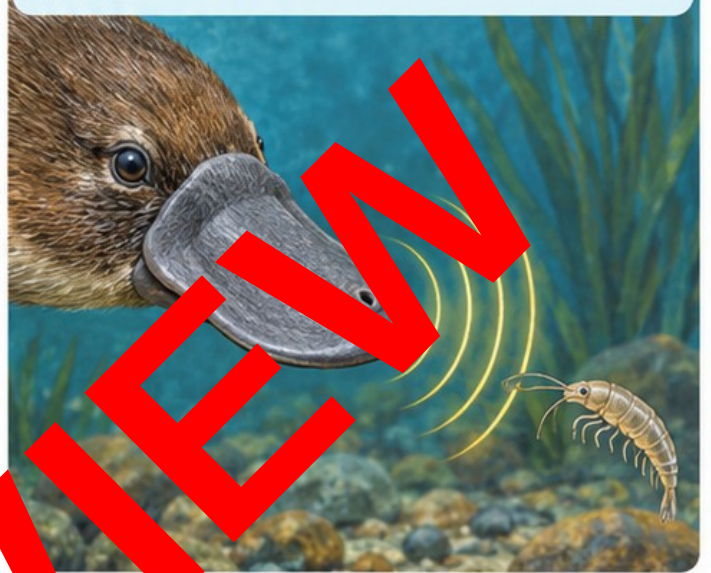
Webbed feet help a platypus swim in freshwater.



Based on: Taronga Zoo — Platypus (taronga.org.au)

C2 Food-finding bill:

Bill electroreceptors detect electrical signals from moving prey underwater.



Based on: Taronga Zoo — Platypus (taronga.org.au)

C3 Moving on land:

A platypus folds webbing under its toes and uses its claws on land.



Based on: Taronga Zoo — Platypus (taronga.org.au)

C4 Habitat needs:

A platypus lives in freshwater streams, rivers and lakes; it feeds on aquatic invertebrates.



Based on: Taronga Zoo — Platypus (taronga.org.au)

Case and Source Cards — 2

C5 | Rooting stems

Angular pigface stems root at nodes. Its spreading growth helps bind loose dune sand.



ANBG — *Carpobrotus glaucescens*

C6 | A plant response

When covered with sand, pigface can grow upward and form a new mat.



ANBG — *Carpobrotus glaucescens*

C7 | Moisture from food

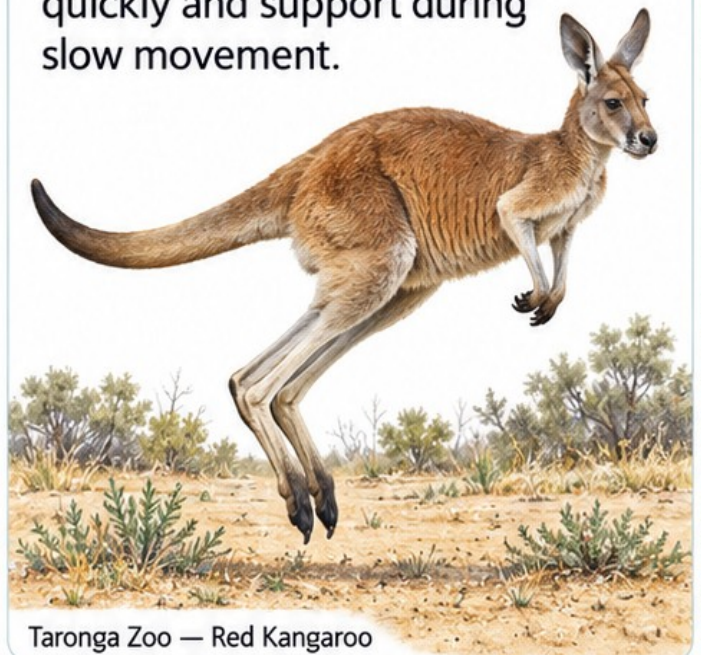
During drought, red kangaroos can obtain moisture by eating grasses and foliage.



Taronga Zoo — Red Kangaroo

C8 | A useful tail

A red kangaroo uses its tail for counterbalance while hopping quickly and support during slow movement.



Taronga Zoo — Red Kangaroo

Evidence Trail – How to Play

A cooperative game for 2–4 students.
Materials: board, challenge cards, case cards and large counters.



1

Take turns.

Move to the next stop.

2

Choose a challenge card.

Give a claim, evidence and a reason.

3

A partner asks one respectful evidence question.

4

Check the teacher criteria together.

Revise if needed.

5

Continue through the next stop.

Everyone explains evidence.



No dice, speed race or elimination.

Point, draw, speak, use a device or let a partner record.

Card 1



Worked turn:

Card 1 → C1.

Webbed feet are a structure that helps swimming.

A source supports the function.



Goal: Help the whole team explain with evidence.

Evidence Trail – Board

1

NOTICE



Choose a challenge.
Give evidence.
Ask a respectful question.
Check and revise.

2

ASK



Choose a challenge.
Give evidence.
Ask a respectful question.
Check and revise.

3

COMPARE



Choose a challenge.
Give evidence.
Ask a respectful question.
Check and revise.

4

EXPLAIN



Choose a challenge.
Give evidence.
Ask a respectful question.
Check and revise.

5

APPLY



Choose a challenge.
Give evidence.
Ask a respectful question.
Check and revise.

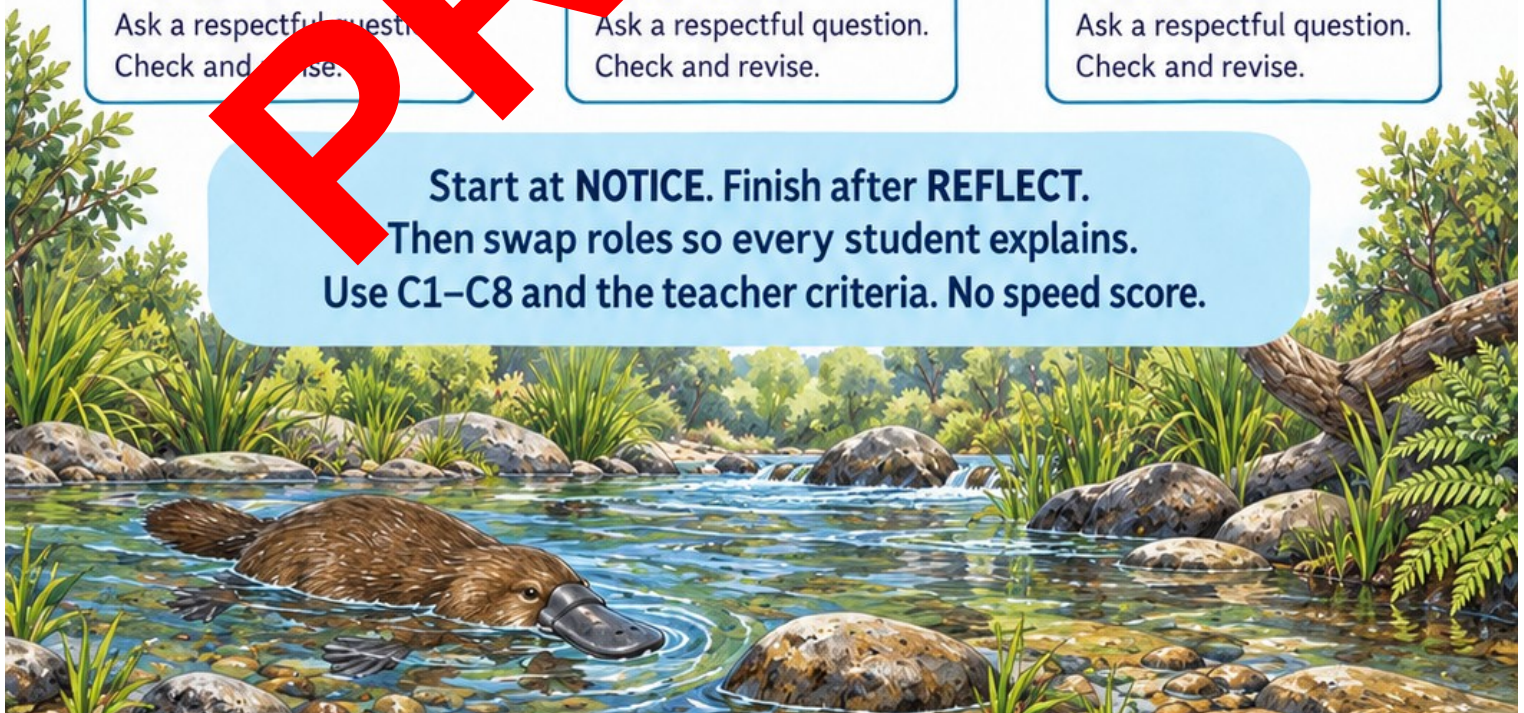
6

REFLECT



Choose a challenge.
Give evidence.
Ask a respectful question.
Check and revise.

Start at **NOTICE**. Finish after **REFLECT**.
Then swap roles so every student explains.
Use C1–C8 and the teacher criteria. No speed score.



Evidence Trail – Challenges

Year 5 Science
Built to Survive



1

C1: Name the structure, function and environment.



2

C2: Explain why the bill is not a battery.



3

C1 and C3: Structure or behaviour? Explain both.



4

C5: Link root systems to loose sand.



5

C7 and C8: Explain a source action and its benefit.



6

Can one platypus choose to grow webbed feet? Explain.



7

A felt cup cools more slowly. What can this not prove?



8

Choose safe habitat care. Name a source and an uncertainty.



Based on: Taronga Zoo — Platypus and Red Kangaroo; ANBG — *Carpobrotus glaucescens*

Survival Questions



Name: _____ Date: _____

Use C1–C8.

NOTICE: Choose an organism. Name one observed feature and one environmental challenge.

ASK: Write a question a source could answer about function.

PLAN: Write a safe question about a cup covering model. Predict and give a reason.

CHECK: Which claims need source evidence?

You may draw and label, point to cards or dictate your reasoning.

Based on: Taronga Zoo – Platypus (taronga.org.au)

Survival Questions



Name: **ANSWERS** Date: _____

Use C1–C8.

NOTICE: Choose an organism. Name one observed feature and one environmental challenge.

Example: Platypus; webbed feet; moving through freshwater.

ASK: Write a question a source could answer about function.

Example: How do webbed feet help movement in water?

PLAN: Write a safe question and a cup covering model. Predict and give a reason.

Example: Does a flat surface change the warming of cool water in a cup?
I predict it may slow warming by changing heat transfer.

CHECK: Which claims need source evidence?

Example: The feature's real function needs a reliable source; model results require observations.

You may draw and label, point to cards or dictate your reasoning.

Based on: Taronga Zoo – Platypus (taronga.org.au)

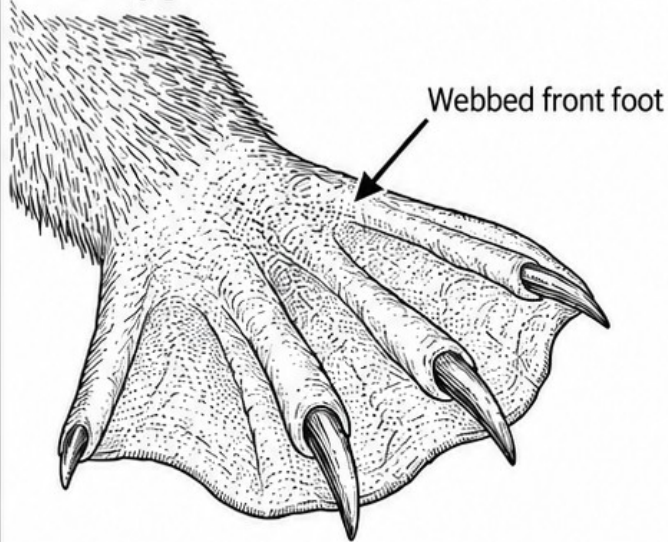
Structural Features

Name: _____

Date: _____

Use C1 and C5.

Platypus webbed front foot

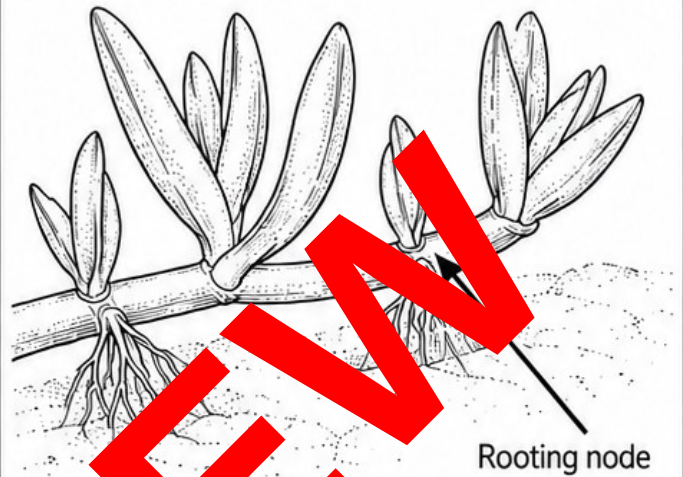


Environment: _____

Function: _____

Source card: _____

Pigface trailing stem



Environment: _____

Function: _____

Source card: _____

EXPLAIN: How does each structure help in its particular environment?

LIMIT: What can the drawings alone not prove?

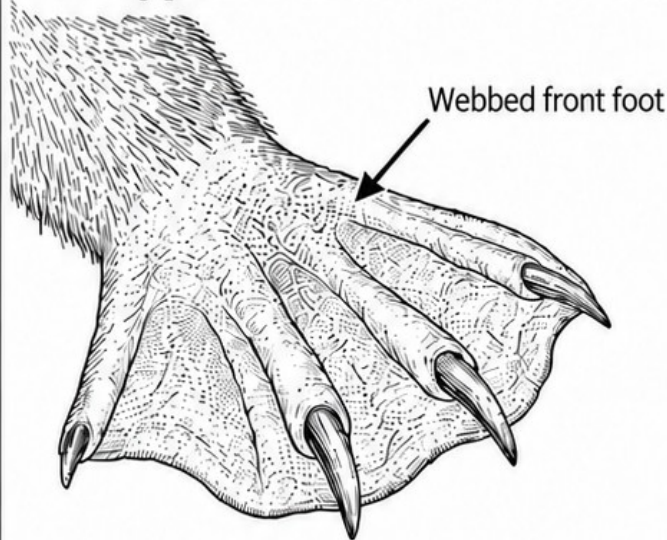
Structural Features

Name: **ANSWERS**

Date: _____

Use C1 and C5.

Platypus webbed front foot

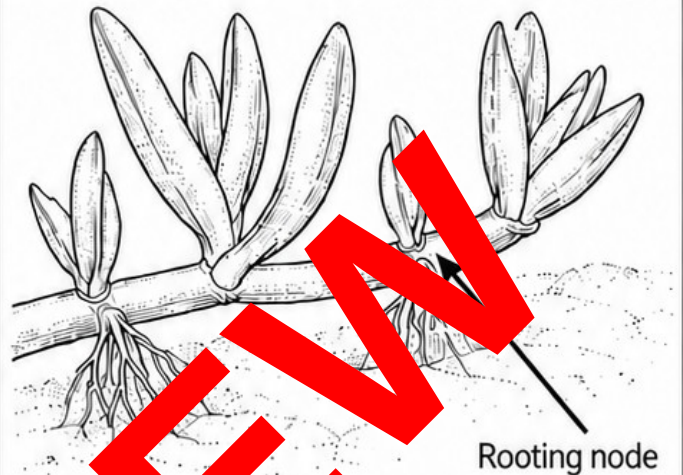


Environment: **freshwater**

Function: **helps swimming**

Source card: **C1.**

Pigface trailing stem



Environment: **coastal dune sand**

Function: **spreading growth helps bind sand**

Source card: **C5.**

EXPLAIN: How does each structure help in its particular environment?

Example: Webbing helps move through water; rooting stems help spreading on loose sand.

LIMIT: What can the drawings alone not prove?

Example: Drawings show structures, but do not demonstrate all their functions or guarantee survival.

Behaviour Matters

Name: _____

Date: _____

Use C1, C3, C5 and C7.

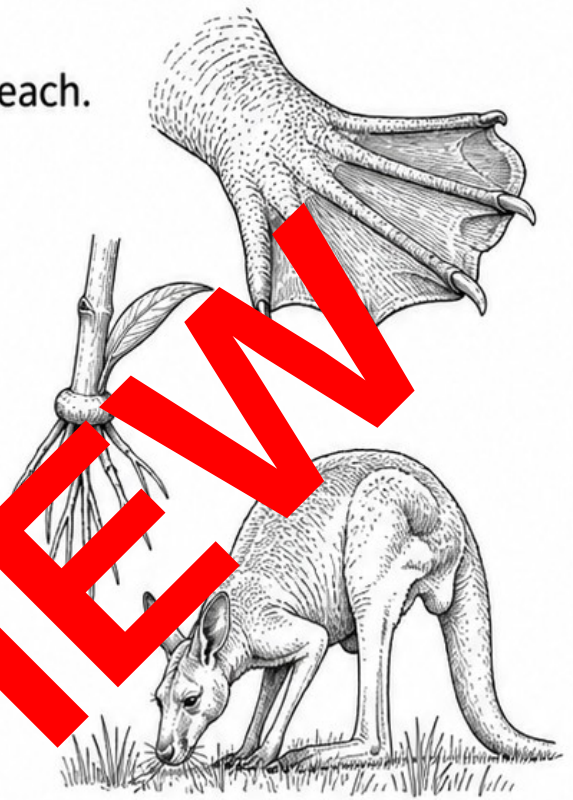
SORT: Write structure or behaviour beside each.

Webbing on a foot: _____

Folding webbing on land: _____

A rooting node on a stem: _____

Eating grasses for moisture: _____



EXPLAIN: Choose one behaviour. Name its environment, function and source card.

REPAIR: “The platypus chose to grow webbed feet.”

Write a scientific correction.

Behaviour Matters

Name: ANSWERS

Date: _____

Use C1, C3, C5 and C7.

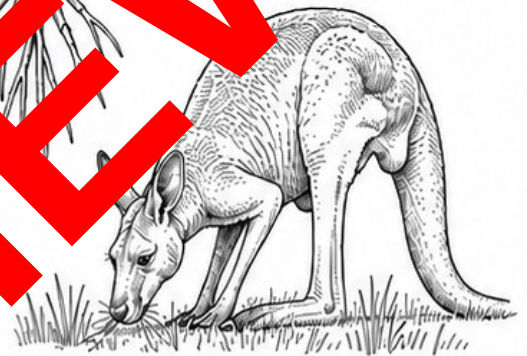
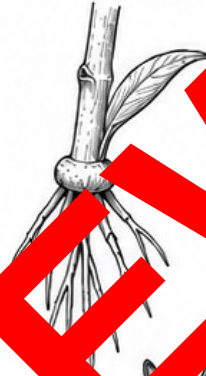
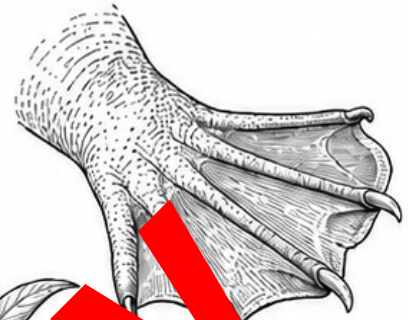
SORT: Write structure or behaviour beside each.

Webbing on a foot: structure

Folding webbing on land: behaviour

A rooting node on a stem: structure

Eating grasses for moisture: behaviour



EXPLAIN: Choose one behaviour. Name its environment, function and source card.

Example: C3 describes folding webbing on land to use claws for movement.

Or C7 describes obtaining moisture from grasses during drought.

REPAIR: “The **platypus** chose to grow webbed feet.”

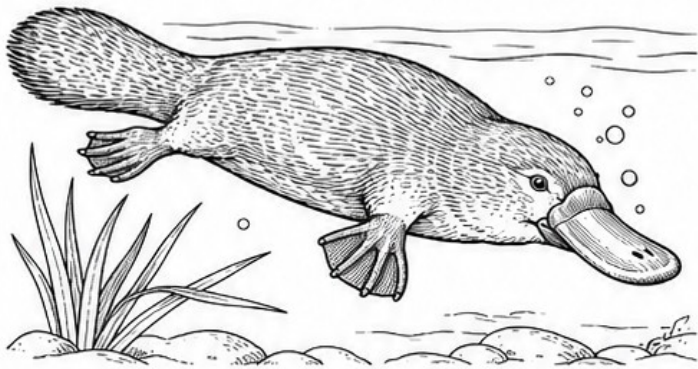
Write a scientific correction.

Example: Webbed feet are inherited features shaped over generations, not consciously grown because an individual wants them.

Compare Environments

Name: _____ Date: _____

Use C1/C4 and C5/C6.



Criterion	Platypus	Angular pig face
Environment		
Challenge		
Structure		
Function and source		

EXPLAIN: Why is one feature not a solution for every environment?

PLAN: For a sleeve cup model, state change, measure and two controls.

CARE: Name one safe choice for organisms or Country/Place.

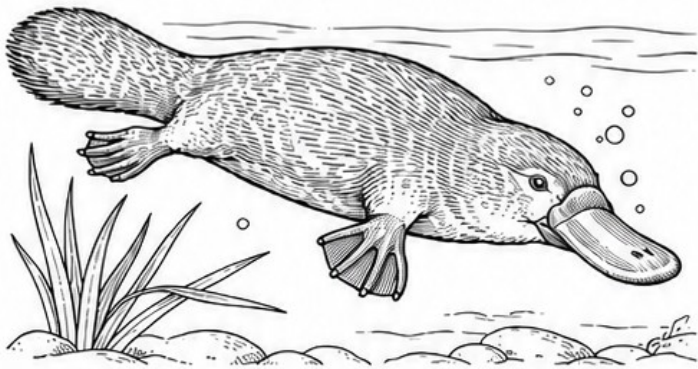
Based on: Taronga Zoo — Platypus (taronga.org.au);

Based on: Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au)

Compare Environments

Name: ANSWERS Date: _____

Use C1/C4 and C5/C6.



Criterion	Platypus	Angular pigface
Environment	freshwater	coastal dunes
Challenge	moving/finding food underwater	loose sand
Structure	webbed feet	rooting stems
Function and source	swimming, C1	spreading/binding sand, C5.

EXPLAIN: Why is one feature not a solution for every environment?

Example: Swimming webbing helps movement in water; a rooted dune plant needs different structures.

PLAN: For a sleeve cup model, state change, measure and two controls.

Example: Change the sleeve; measure temperature in °C; keep cup type and water volume the same.

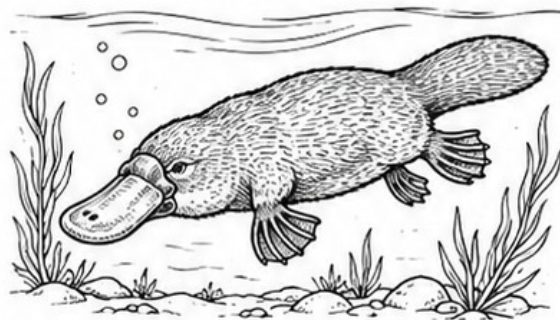
CARE: Name one safe choice for organisms or Country/Place.

Example: Leave plants/habitats undisturbed; use models instead of animal stress tests.

Based on: Taronga Zoo — Platypus (taronga.org.au);

Based on: Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au)

Evidence Versus Story



Name: _____ Date: _____

For each claim, mark supported, unsupported or contradicted. Cite a card and improve the claim.

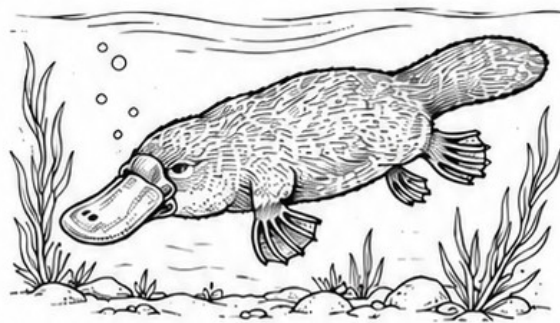
Claim	Judgement and source	Improved explanation
A. A platypus chooses to grow webbed feet.		
B. The bill detects electrical signals from moving prey.		
C. One felt-cup result proves every animal survives better with thick fur.		

METHOD: One two tails and other group needs to repeat the cup model.

PRECISION: State a suitable temperature unit and recording precision.



Evidence Versus Story



Name: **ANSWERS** Date: _____

For each claim, mark supported, unsupported or contradicted. Cite a card and improve the claim.

Claim	Judgement and source	Improved explanation
A. A platypus chooses to grow webbed feet.	contradicted C1/C3 show functions, not choice; inherited structures are shaped over generations.	Inherited webbed feet help swimming. An individual does not choose the structure.
B. The bill detects electrical signals from moving prey.	supported C2 electroreceptors help find prey underwater.	Bill electroreceptors help find prey underwater by detecting electrical signals.
C. One felt-cup result proves every animal survives better with thick fur.	unsupported The evidence is a physical model, not a living-animal survival test.	A felt-cup test concerns a covering effect in materials. It cannot prove animal survival.

METHOD: One two tails and other group needs to repeat the cup model.

example: 5 mL, identical cup; three cups per condition; record at 0, 5, 10 min.

PRECISION: State a suitable temperature unit and recording precision.

°C, nearest 1 °C with a suitable thermometer.



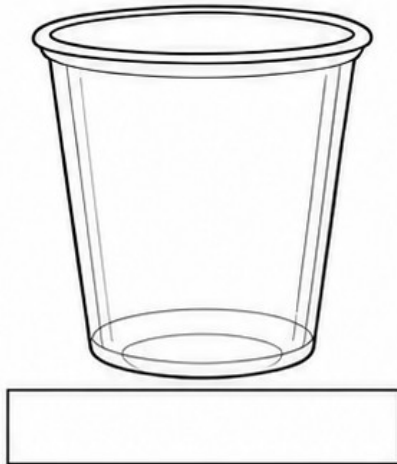
Investigate a Model — Plan

Name: _____

Date: _____

QUESTION: Does a felt sleeve change how quickly cool water warms?

Compare and label the two identical open plastic cups: one with a sleeve around its sides, one bare.
Label: physical models, not animals.



PREDICTION and reason:

CHANGE: _____

MEASURE and unit: _____

KEEP THE SAME:

METHOD:

Six identical cups; three wrapped and three unwrapped; 50 mL cool water each;
similar starts; record at 0, 5 and 10 minutes to nearest 1 °C.

SAFETY and roles: No heat, trapping or live-animal tests.

Investigate a Model — Plan

Name: _____

ANSWERS

Date: _____

QUESTION: Does a felt sleeve change how quickly cool water warms?

Compare and label the two identical open plastic cups: one with a sleeve around its sides, one bare.
Label: physical models, not animals.



Unwrapped model



Wrapped model

PREDICTION and reason:

Example: A sleeve may slow warming by changing heat transfer.

Actual results may differ.

CHANGE: side sleeve

MEASURE and unit: water temperature in °C.

KEEP THE SAME:

Example: cup size; volume; starting temperature; room; times; open tops.

METHOD:

Six identical cups; three wrapped and three unwrapped; 50 mL cool water each;
similar starts; record at 0, 5 and 10 minutes to nearest 1 °C.

SAFETY and roles: No heat, trapping or live-animal tests.

Example: Plastic cups on a tray; wipe spills; keep away from power.

Rotate measurer/recorder/timer/reviewer roles. This is a model test.

Investigate a Model – Record

Name: _____

Date: _____



Evidence origin: our classroom cup measurements. Leave cells blank until observed.

Condition / trial	0 min (°C)	5 min (°C)	10 min (°C)	Time after 10 min (°C)
Wrapped 1				
Wrapped 2				
Wrapped 3				
Unwrapped 1				
Unwrapped 2				
Unwrapped 3				

PATTERN: Compare the temperature changes across trials.

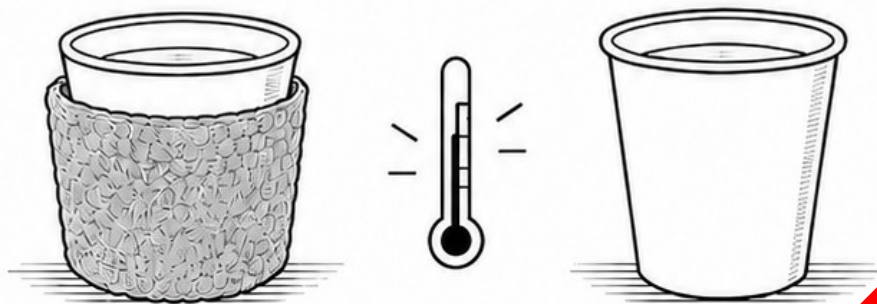
CONCLUSION: What does your evidence suggest under these conditions?

LIMIT and improvement: Name one limitation and a way to improve the method. No change is a valid result.

Investigate a Model – Record

Name: **ANSWERS**

Date: _____



Evidence origin: our classroom cup measurements. Leave cells blank until observed.

Condition / trial	0 min (°C)	5 min (°C)	10 min (°C)	Time after 10 min (°C)
Wrapped 1	varies	varies	varies	end – start
Wrapped 2	varies	varies	varies	end – start
Wrapped 3	varies	varies	varies	end – start
Unwrapped 1	varies	varies	varies	end – start
Unwrapped 2	varies	varies	varies	end – start
Unwrapped 3	varies	varies	varies	end – start

PATTERN: Compare the temperature changes across trials.

Compare all three rises in each condition. Report variation.

CONCLUSION: What does your evidence suggest under these conditions?

Example: Under our conditions, the sleeve changed/did not clearly change the warming. Support with actual values.

LIMIT and improvement: Name one limitation and a way to improve the method. No change is a valid result.

Example: Unequal starts or reading delays can affect comparison; improve the procedure. A cup lacks living tissues and behaviour. Do NOT invent readings.

Interpret Evidence and Limits

Name: _____

Date: _____

ILLUSTRATIVE MODEL DATA — practice only; not class measurements, animal results or Taronga research.

Time (min)	Wrapped (°C)	Unwrapped (°C)
0	12	12
5	14	16
10	16	19



COMPARE: Temperature rise after 10 min: wrapped _____ °C; unwrapped _____ °C.

SUGGEST: _____

CANNOT PROVE and why: _____

One method improvement: _____

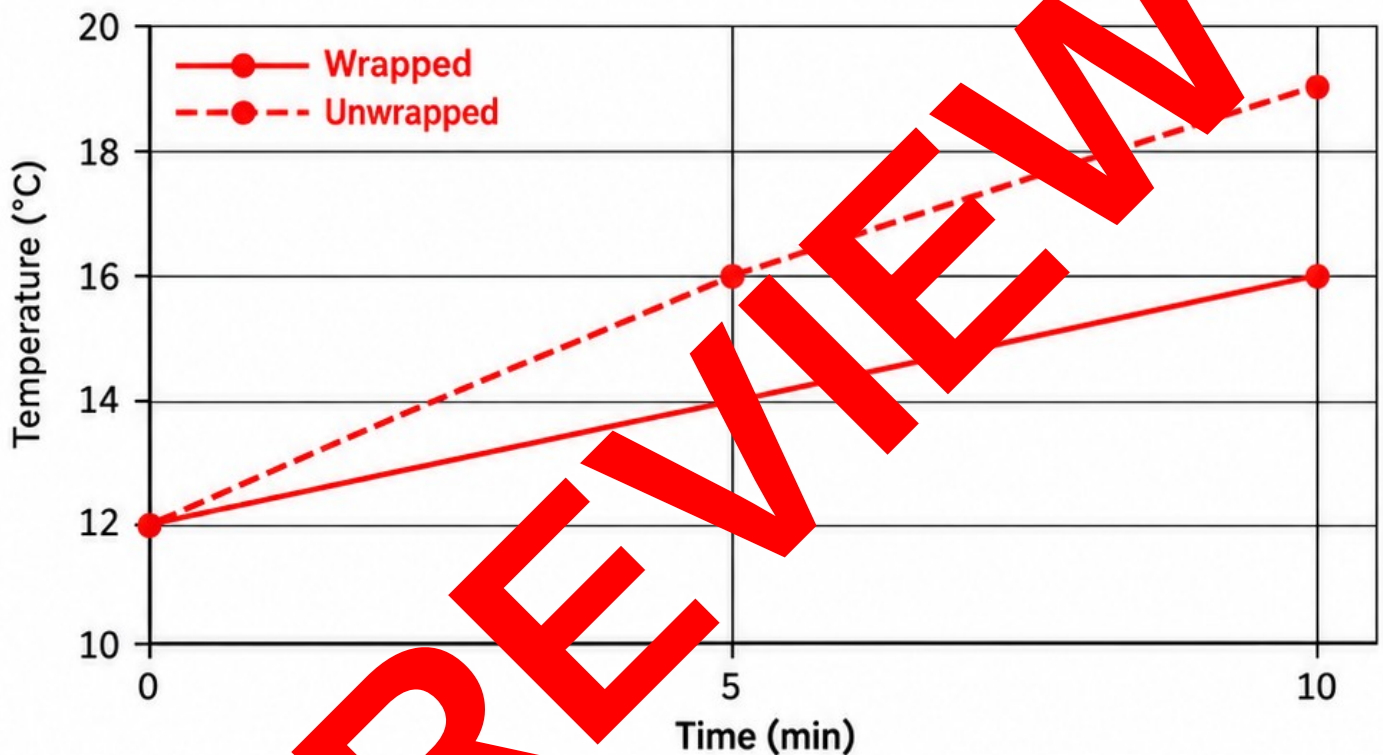
Interpret Evidence and Limits

Name: ANSWERS

Date: _____

ILLUSTRATIVE MODEL DATA — practice only; not class measurements, animal results or Taronga research.

Time (min)	Wrapped (°C)	Unwrapped (°C)
0	12	12
5	14	16
10	16	19



COMPARE: Temperature rise after 10 min: wrapped 4 °C; unwrapped 7 °C.

SUGGEST: The cups have slowed warming in this illustrative example under these conditions.

CANNOT PROVE and why: Real-animal survival; cups have no living tissues, metabolism or behaviour.

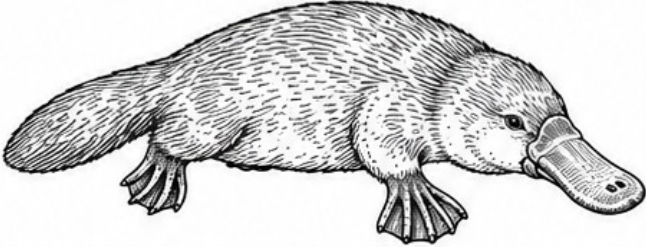
One method improvement: Match starts and keep thermometer depth/timing consistent; use independent repeats.

Build the Comparison

Name: _____

Date: _____

Choose a plant and an animal from C1–C8.

Animal	Plant
	
Environment: _____ _____	Environment: _____ _____
Structural feature: _____ _____	Structural feature: _____ _____
Function: _____ _____	Function: _____ _____
Source card: _____ _____	Source card: _____ _____

ANIMAL BEHAVIOUR: Name one survival action, its context and benefit.

PLANT RESPONSE: Explain Co without giving the plant an intention.

EVIDENCE LIMIT: What is outside your sources or model?

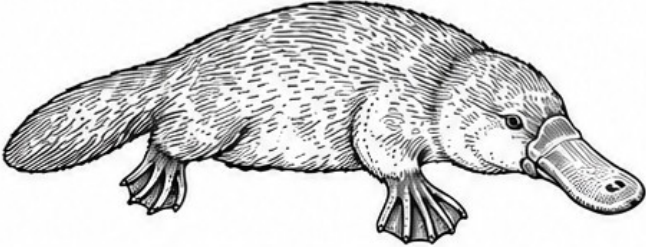
COMMUNITY: A fictional school wants to prevent litter near a creek. What evidence and safety matter?

Build the Comparison

Name: **ANSWERS**

Date: _____

Choose a plant and an animal from C1–C8.

Animal	Plant
	
Environment: freshwater	Environment: coastal dunes
Structural feature: webbed feet	Structural feature: rooting stems
Function: swimming	Function: spreading across sand
Source card: C1	Source card: C1

ANIMAL BEHAVIOUR: Name one survival action, its context and benefit.

Example: folds webbing to land, uses claws, C3.

PLANT RESPONSE: Explain Co without giving the plant an intention.

Example: describes upward growth after sand cover, not a conscious decision.

EVIDENCE LIMIT: What is outside your sources or model?

Example: Helpful structures do not guarantee survival; cup results are not organism evidence.

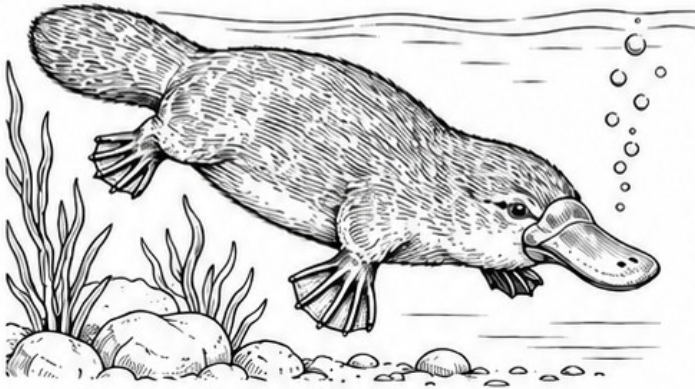
COMMUNITY: A fictional school wants to prevent litter near a creek. What evidence and safety matter?

Example: Use source evidence about habitat pressures; prevent litter safely with adults, no water entry or trapping.

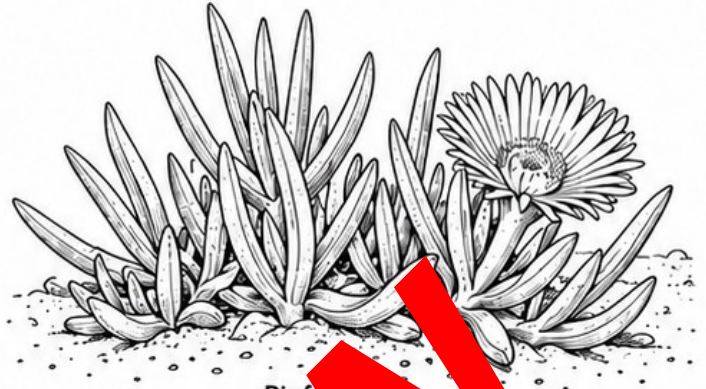
Survival-Science Conference

Name: _____ Date: _____

Audience: _____



Platypus



Pigface
(*Carpobrotus glaucescens*)

CLAIM: Explain your plant-and-animal comparison.

EVIDENCE: Identify a source fact and the true origin of your model record.

TRANSFER: If a creek dried up and collapsed, what follows from evidence? What stays uncertain?

REVIEW: A partner asks a useful question and your response.

COLLABORATION: What does different scientific expertise add?

Respond in writing, labels, speech, gestures or supported choices.

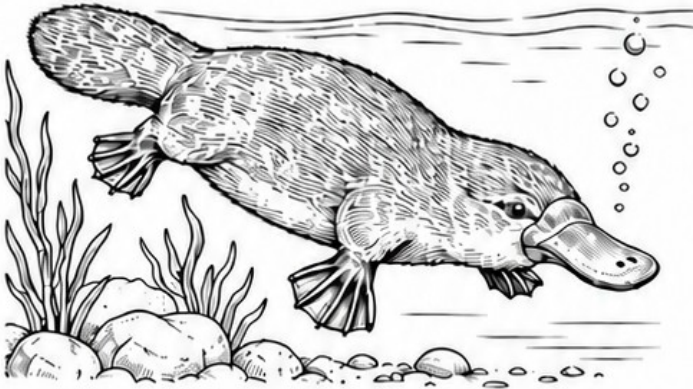
Based on: Taronga Zoo — Platypus (taronga.org.au); Based on: Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au)

Survival-Science Conference

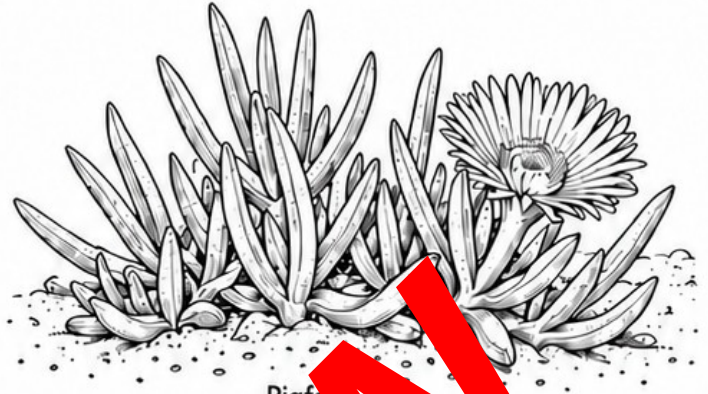
Name: **ANSWERS**

Date: _____

Audience: **Example: Another Year 5 class**



Platypus



Pigface
(*Carpobrotus glaucescens*)

CLAIM: Explain your plant-and-animal comparison.

Example: Platypus webbing helps swimming (C1); pigface rooting stems helps find sand (C5).

EVIDENCE: Identify a source fact and the true origin of your model record.

Example: C1 supports swimming; C5 supports sand finding. State whether your model record is measured in class or illustrative practice.

TRANSFER: If a creek dries and covers in sand, what follows from evidence? What stays uncertain?

Example: A dry creek removes needed water; webbing cannot replace it. Pigface can grow upward after sand cover (C6), but survival under every depth/timing is unproven.

REVIEW: A partner asks a useful question and your response.

Example: Answers vary; support a specific claim and acknowledge a limit.

COLLABORATION: What does different scientific expertise add?

Example: Ecology, genetics and reproduction combine different evidence and earlier findings; classroom teamwork is separate.

Respond in writing, labels, speech, gestures or supported choices.

Based on: Taronga Zoo — Platypus (taronga.org.au); Based on: Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au)

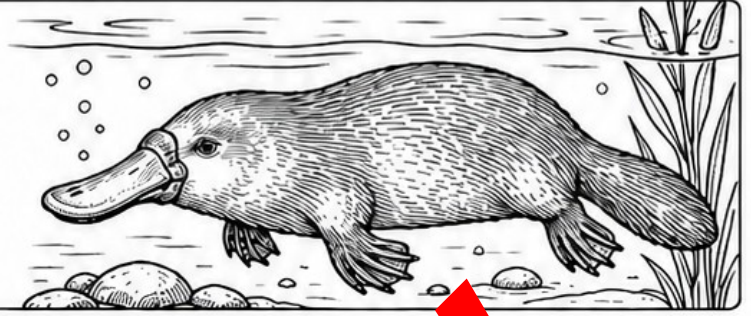
Conservation Application

Name: _____

Date: _____

Fictional school decision:

Prevent litter leaving school grounds,
or set wildlife traps without expert
approval?



RECOMMEND: A safe action and the organism need it supports.

SOURCE: Which fact supports it?

LIKELY EFFECT and uncertainty

PLAN: Who helps? What permission is needed? How could the school review its own action?

COLLABORATION: Name one scientific expertise contribution.

**No water entry, wildlife handling or
habitat removal.**

Based on: Taronga Zoo – Platypus (taronga.org.au)



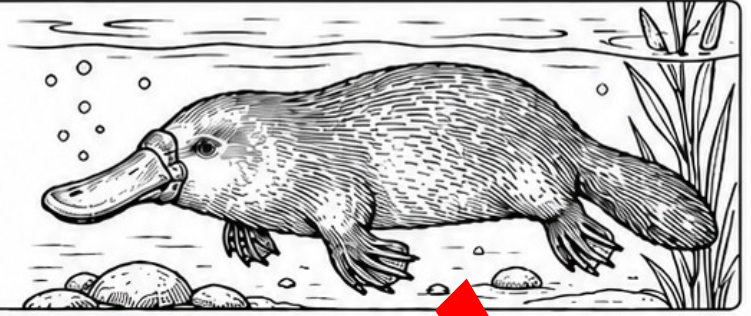
Conservation Application

Name: **ANSWERS**

Date: _____

Fictional school decision:

Prevent litter leaving school grounds,
or set wildlife traps without expert
approval?



RECOMMEND: A safe action and the organism need it supports.

Safe litter prevention and adult reporting; protect freshwater habitat with minimal stress.

SOURCE: Which fact supports it?

Taronga identifies pollution/habitat damage and trapping pressure.

LIKELY EFFECT and uncertainty

May reduce litter reaching water, but not provide a healthy creek or population recovery.

PLAN: Who helps? What permission is needed? How could the school review its own action?

Teacher-approved school-ground observation; adults handle hazardous waste; compare school litter records.

COLLABORATION: Name one scientific expertise contribution.

Habitat, genetic or reproductive expertise adds evidence for conservation decisions.

**No water entry, wildlife handling or
habitat removal.**

Based on: Taronga Zoo — Platypus (taronga.org.au)



Quiz – Teacher Use

Use Built to Survive - Year 5 - Quiz.pptx after the relevant teaching. Ten questions each have a separate answer/reasoning slide, plus response instructions and reflection.

The two anchor questions check conscious choice of webbing and the bill's electroreceptors. Additional checks cover structure/behaviour, plant feature/function, fair method, illustrative temperature data, collaboration, model limits, transfer and a safe community choice.

Offer time to think, partner rehearsal, labelled drawings, speech or communication-device responses. Keep all feedback factual. Use the practical/source portfolio and two-page assessment to check the complete inquiry learning; quiz results alone are insufficient.

PREVIEW

Assessment — Built to Survive

Name: _____ Date: _____

Compare one plant and one animal from the case cards. Explain a structure for each, a sourced animal behaviour and the environmental challenges. Keep plant growth responses separate from conscious choices.

Use your lesson records and source cards. Write, draw/label, speak, record, point or use a communication device; the same reasoning is assessed.

Animal	Plant
Environment: _____ _____ _____	Environment: _____ _____ _____
Structure and function: _____ _____ _____	Structure and function: _____ _____ _____
Source: _____ _____	Source: _____ _____
	

Sourced animal behaviour and benefit:

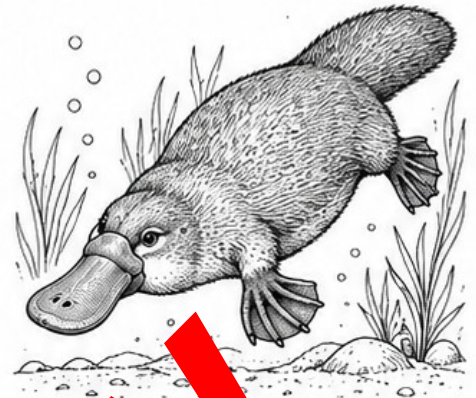
Model record origin, one result/pattern and a limit:

Assessment — Explain and Transfer

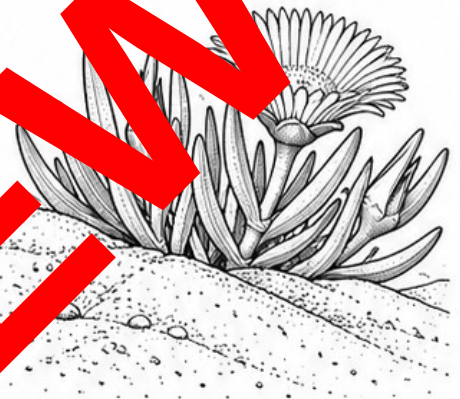
Name: _____

Date: _____

EXPLAIN: Connect your two organisms, evidence and environment.



TRANSFER: New situation — pigface is partly covered by sand. Use C6.
Explain a possible response and what remains uncertain.



COLLABORATION: How do different experts learn? How do findings help real conservation research?

COMMUNITY: Recommend the habitat care with a source, likely effect and uncertainty.

CONFERENCE: Describe your model controls, possible error and improvement.

Alternative response record: Teacher may attach an equivalent spoken, drawn or supported explanation.

Rubric — Built to Survive

Name: _____

Date: _____



Criteria	Incomplete	Sound	Transfer
Understanding	Feature or behaviour is inaccurate or unlinked.	Correct plant/animal structures and animal behaviour linked to environment.	Explains functions carefully to changed conditions without invented intentions.
Evidence and process	Source/data origin or fair method is unclear.	Cites relevant cards, identifies data origin, control and repeated measures.	Evaluates a specific error and a useful improvement.
Explanation	Claim lacks supported reason.	Explains a two-organism comparison and a model limit.	Defends a new case with a meaningful uncertainty.
Responsibility	Conclusion or action has no evidence-based reason.	Explains expertise and a safe science-informed action.	Weighs effects, uncertainty and evidence needed for a decision.

Support, communication method, speed and neatness do **not** determine achievement.

Evidence / next step:

PREVIEW

Built to Survive
Year 5
Lesson survival questions



Our learning

Connect an organism, an environmental challenge and a helpful feature.

Ask a question that evidence can answer.

PREVIEW

Notice before explaining

A platypus lives in freshwater. Look at its broad front feet and bill.

What can you observe? What needs a source?

PREVIEW



Based on: Taronga Zoo — Platypus (taronga.org.au)

Structure and function

A structure is a body part. A function is what it does.

Webbed feet help a platypus move through water while finding food.

PREVIEW

Based on: Taronga Zoo – Platypus (taronga.org.au)

A sourced explanation

Challenge: moving through water.

Structure: webbed feet.

Function: swimming. Source: Taronga Zoo.

This helps survival: it does not guarantee.

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au)

Observation or inference?

“The drawing shows webbed feet” is an observation of a drawing.

“Webbing helps swimming” is a sourced explanation.

The drawing alone cannot prove the function.

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au)

Two kinds of question

Source question: How does the bill help find prey?

Model question: Does a felt sleeve change how quickly cool water warms?

We do not test survival by stressing an animal

PREVIEW

Plan a reasonable prediction

I predict the sleeve will change the temperature rise because covering the sides can affect heat transfer.

A prediction may be wrong. We keep the actual results.

PREVIEW

Your evidence question

Use C1–C8 and W01. Choose a real organism.

Notice a feature; name a challenge; write one source question.

Then write one testable question about safe model organisms.

PREVIEW

Ways to explain

Write, draw and label, speak, point to source cards, or use a communication board/device.

A partner or adult may record your reasoning.

Challenge: say what evidence would change your idea.

PREVIEW

Check your link

Which part of your explanation is observed, sourced or predicted?

Name the organism, challenge and evidence.

A question about suffering is replaced with a safe model or source question.

PREVIEW

PREVIEW

We Done!
Lesson 1: Survival questions



PREVIEW

Built to Survive
Year 5
Lesson 1: Structural features



Our learning

Explain how a sourced structural feature helps survival in a particular environment.

Compare a plant and an animal.

PREVIEW

Retrieve the link

Complete: webbed feet → swimming → finding food in freshwater.

Which part names a structure? Which names a function?

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au)

The platypus bill

Electroreceptors in the bill detect electrical signals from moving prey.

They help the platypus find food underwater.

The bill is not a battery or a human eye.



Based on: Taronga Zoo — Platypus (taronga.org.au)

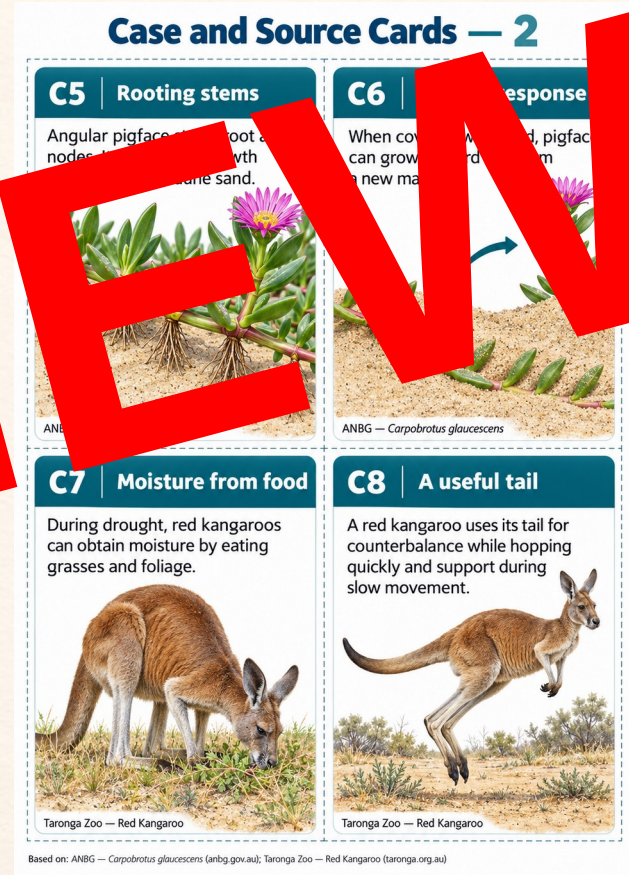
Pigface on coastal dunes

Angular pigface has trailing stems that root at nodes.

Its spreading growth helps bind loose dune sand.

Its thick, fleshy leaves have a structure:

appearance and the nodes that provide every function.



Based on: Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au); Taronga Zoo — Red Kangaroo (taronga.org.au)

A careful plant explanation

Structure: stems with rooting nodes.

Context: loose coastal sand.

Function: spreading and binding sand.

We use the source: we do not invent a water-storage mechanism.

PREVIEW

Based on: Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au)

Compare the same criteria

Use W02 to annotate a platypus foot and pigface stem.

For each: name the structure, function, environment and source.

Draw arrows to the part you mean

PREVIEW

Real scientific collaboration

Taronga works with UNSW and San Diego Zoo Wildlife Alliance on platypus conservation research.

Ecology, genetics and reproduction contribute different evidence.

PREVIEW

Based on: Taronga Zoo – Platypus (taronga.org.au)

Why expertise matters

Habitat observations show conditions; genetic research informs population management; reproductive knowledge supports breeding decisions. Earlier findings guide the next question. One will do one can miss part of the problem.

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au)

Our classroom roles

Fictional model team: observer, measurer, modeller and reviewer.

Combine careful records with a check of the method.

Our cup results are classroom evidence not To only research.

PREVIEW

Check your explanation

Explain one plant structure and one animal structure.

Link each to the relevant challenge.

How does real collaboration improve the evidence they are working with a group?

PREVIEW

PREVIEW

We Done!
Lesson 2: Structural Features



PREVIEW

Built to Survive
Year 5
Lesson 3: Behaviour matters



Our learning

Distinguish a body structure from an action.

Use sourced behaviour to explain survival.

PREVIEW

Retrieve and sort

A webbed foot is a structure.

Swimming is an action.

A tail is a structure; using it for balance is an action.

Say which evidence supports each.

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au); Based on: Taronga Zoo — Red Kangaroo (taronga.org.au)

A change of movement

On land, a platypus folds its webbing under its toes and uses its claws.

The webbing is a structure. Folding it is an action in a different context.

PREVIEW



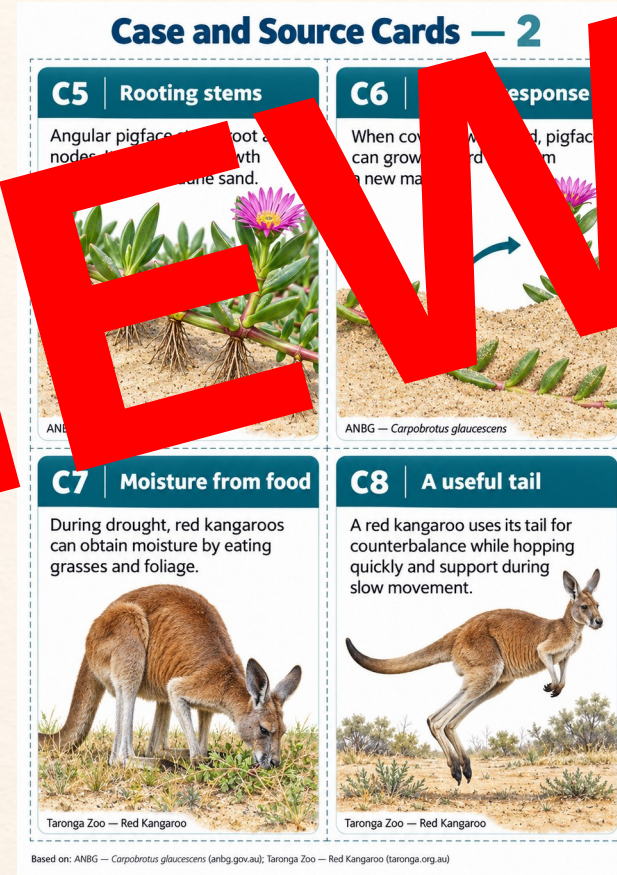
Based on: Taronga Zoo — Platypus (taronga.org.au)

Red kangaroo movement

When hopping quickly, a red kangaroo uses its tail as a counterbalance.

When moving slowly, the tail can support weight as an extra limb.

PREVIEW



Based on: Taronga Zoo — Red Kangaroo (taronga.org.au); Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au)

Water from food

Taronga explains that red kangaroos can obtain moisture by eating grasses and foliage during drought.

Eating is a behaviour. It helps, but does not make kangaroos harmless.

PREVIEW

Based on: Taronga Zoo — Red Kangaroo (taronga.org.au)

Classify with evidence

Use W03 and C1–C8. Sort webbing, folding webbing, a rooting node and leading grasses.

For each action, name the situation and possible survival benefit.

PREVIEW

Plants respond too

Pigface can grow upward when covered by sand and form a new main stem.

This is a sourced growth response.

Do not describe it as a plant deciding or walking to safety.

PREVIEW

Based on: Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au)

Adaptation over generations

An adaptation is an inherited feature or behaviour shaped over generations.

An individual does not choose to grow a new adaptation during their lifetime.

Not every action is an inherited adaptation.

PREVIEW

Evidence Trail practice

Take one G1 challenge card. Give a claim and the matching source card.

A partner asks a respectful evidence question.

Use the teacher criteria; there is no special race

PREVIEW

Check the distinction

Explain why “webbed feet” and “folding the webbing on land” are different kinds of example.

Appearance alone is insufficient evidence of a behaviour

PREVIEW

PREVIEW

We Done!
Lesson 3: Behave your manners



PREVIEW

Built to Survive
Year 5
Lesson 4: compare environments



Our learning

Compare environments using the same criteria.

Plan a fair and safe question; avoid one-feature-fits-all claims.

PREVIEW

Retrieve the challenge

What helps a platypus move through freshwater?

Would that explanation alone justify the same feature for a dune larva?

PREVIEW

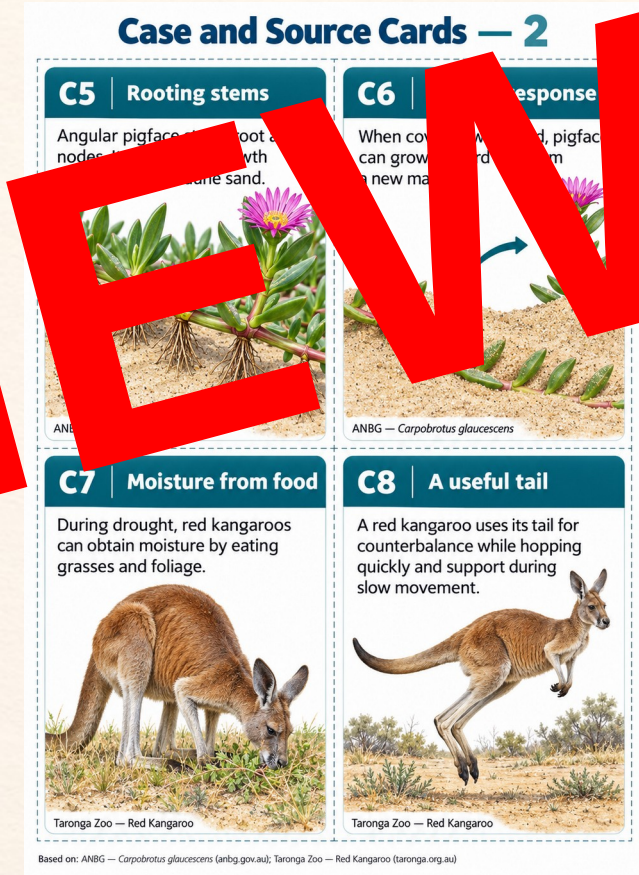
Based on: Taronga Zoo — Platypus (taronga.org.au)

Freshwater and coastal dunes

Freshwater case: movement and food
underwater.

Coastal dune case: loose sand, salt spray and
periods without rain

Use the actual benefits and source rather than
every river every desert.



Based on: Taronga Zoo — Platypus and Red Kangaroo (taronga.org.au); Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au)

Compare, then explain

Use W04: water/ground conditions; movement or growth; sourced structure
function.

Platypus webbing helps swimming. Digging rootling stems help bind ground.

A helpful feature is use of in a context

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au); Based on: Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au)

Source question or fair test?

We read sources for real animal survival.

For a classroom model, ask: does adding a felt sleeve change the warming of cool water in a cup?

This tests a covering for animal survival.

PREVIEW

Change one thing

Change: felt sleeve around the sides.

Keep: cup type, water volume, starting temperature, room, time and cover top.

Measure: temperature in degrees Celsius.

Use three separate cups for each condition.

PREVIEW

Safety and care

Use plastic cups, cool water, trays and digital thermometers.

Keep water away from power and walk around trays.

No heating, live-animal handling, trapping or fires.

Leave outdoor plants and habitats undisturbed.

PREVIEW

Prepare the method

Identify a risk and its control.

Label the two cup conditions on W06a.

Choose recording times and roles

Explain why comparing different cup sizes would be inf

PREVIEW

Access and challenge

Choose two cards at a time, use labelled pictures, or dictate your comparison.

Challenge: identify another variable that could confound the model.

PREVIEW

Check the context

Give a sourced reason one feature helps in one environment.

Name what changes, what stays the same and what your measure in the model.

PREVIEW

PREVIEW

We Done!
Lesson 4 Compose environments



PREVIEW

Built to Survive
Year 5
Lesson 5 Evidence versus story



Our learning

Check claims against sources.

Reject invented intentions and improve a repeatable method.

PREVIEW

A just-so story

“The platypus wanted to swim, so it grew webbed feet.”

Which words invent an intention?

A need does not prove that an individual chose a new structure.

PREVIEW

A better explanation

Inherited webbed feet help swimming.

Adaptations are shaped over generations.

Taronga supports the function; our class does not pose evolution. It ten lessons.

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au)

Evidence for a function

“The bill is a battery” is incorrect.

Its receptors detect electrical signals from moving prey.

Use C2 to explain the function in freshwater.

PREVIEW

Based on: Taronga Zoo – Platypus (taronga.org.au)

Check three claims

Use W05. Mark supported, unsupported or contradicted.

Cite the matching card and repair the weak claim

A model result cannot prove every animal survives

PREVIEW

Repeatable cup procedure

Use six identical plastic cups: three wrapped, three unwrapped.

Add 50 mL cool water to each. Start near the same temperature.

Keep all open tops, positions and observation time comparable.

PREVIEW

Choose sensible precision

Read a suitable digital thermometer to the nearest 1 °C and record °C

Record at 0, 5 and 10 minutes using a consistent routine.

Record actual differences; do not invent extra precision.

PREVIEW

Fairness before starting

Check the sleeve thickness and height, water amount and start temperature.

If starts differ, report that limit or restart safely with fresh water.

Repeat trials use separate cups, not one result copied three times.

PREVIEW

Record honestly

Make your prediction before testing.

Leave result cells blank until observed.

No change is a valid result.

Clean spills, dry equipment and return materials.

PREVIEW

Check your repair

Explain why the repaired claim is stronger.

Give one method detail that another group would need to repeat your test.

PREVIEW

PREVIEW

We Done!
Lesson 5 Evidence versus story



PREVIEW

Built to Survive
Year 5
Lesson 1 Investigate a model



Our learning

Carry out a fair comparison of cup coverings.

Record repeated temperatures and explain what the numbers represent.

PREVIEW

Model and organism

A felt sleeve is a physical model of a covering.

A cup does not have living skin, metabolism or behaviour.

This practical cannot establish what a real animal does.

PREVIEW

Equipment and setup

Six identical plastic cups, tray, felt sleeves, large clips, measuring jug, timer and digital thermometers.

Teacher supplies cool water. No boiling water, heater, fire or live organisms.

PREVIEW

Before the timer

Label wrapped W1–W3 and unwrapped U1–U3.

Add 50 mL water per cup; check similar starting temperatures.

Wrap only the sides, leave all tops open, and place in a tray.

PREVIEW

Measure the temperatures

Start together. Record at 0, 5 and 10 minutes on W06b.

Use the same thermometer depth and consistent reading routine.

Record to the nearest 1 °C. Keep each trial.

PREVIEW

Share the work

Measurers read; recorders write; timers call the intervals; reviewers check controls.

Rotate accessible roles.

No one needs to touch timer equipment to know what's going on.

PREVIEW

Represent the results

Use a table first. Plot temperature against time with labelled units.

Use a separate line for each condition or chosen trial and label which

Do not confuse time with temperature.

PREVIEW

A bounded conclusion

Compare temperature change for each trial.

Say whether the sleeve slowed, changed or did not clearly change warming.

Use your actual values, even if the prediction was wrong.

PREVIEW

If the practical cannot run

Use W07's clearly labelled illustrative data for interpretation.

State that you did not collect it.

It supports practising analysis; it does not replace evidence or planning and safe method reasoning.

PREVIEW

Check and clean up

Name your variable, one control, a recorded value and a limitation.

Empty water safely, dry the tray and store equipment.

Cup-covering evidence is not a real animal survival test.

PREVIEW

PREVIEW

We Done!
Lesson 6: Investigate a model



PREVIEW

Built to Survive
Year 5
Lesson 7: Interpret limits



Our learning

Use tables and graphs to make a bounded conclusion.

Explain method error and model limits.

PREVIEW

Retrieve the origin

Is your table measured in class or illustrative?

State the origin before drawing a conclusion.

Preserve all trials, including an unusual value.

PREVIEW

Illustrative model data

Practice data only; not observed in this class.

Wrapped trial: 12, 14, 16 °C at 0, 5, 10 min.

Unwrapped trial: 12, 16, 19 °C.

The two cups had different temperature rises.

PREVIEW

What this suggests

In this example the wrapped cup warmed by 4 °C and the unwrapped cup by 7 °C.

The sleeve appears to slow warming under these conditions.

Check repeated trials before generalising.

PREVIEW

What it cannot prove

It does not prove animal fur has the same effect in every setting.

The cup lacks living tissues, metabolism and behaviour.

It does not explain evolution or prove organisms survive.

PREVIEW

Method limits and next steps

Different starts, sleeve gaps, reading delays or thermometer depth can affect comparison.

Identify one possible error and one improvement.

Repeat safely or consider alternative organism sources.

PREVIEW

Explain on W07

Interpret the labelled practice data and make a table/graph claim.

Then add a method limitation and a model limitation.

You may use your own recorded data instead with its origin.

PREVIEW

Real collaboration revisited

Taronga's conservation work combines partners' ecological, genetic and reproductive knowledge.

Earlier research improves rescue and population-management decisions.

Our classroom cup test answers a much smaller question.

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au)

Fictional review meeting

Observer checks conditions; measurer checks readings; modeller checks representation; reviewer checks limits.

What would the team miss if no one questioned the conclusion?

This meeting is a classroom scenario

PREVIEW

Check your boundary

Finish: “This evidence suggests ... under these conditions. It cannot show ...
because ...”

Name a useful next step without harming a living thing

PREVIEW

PREVIEW

We Done!
Lesson 7: Interpreting



PREVIEW

Built to Survive
Year 5
Lesson build the comparison



Our learning

Connect environment, structure, behaviour and evidence.

Use the comparison to consider a community decision

PREVIEW

Retrieve from two sources

Platypus: freshwater movement and prey finding.

Pigface: rooting stems on coastal dunes.

Which feature and function can each source support?

PREVIEW



Based on: Taronga Zoo — Platypus (taronga.org.au); Based on: Australian National Botanic Gardens — Carpobrotus glaucescens (anbg.gov.au)

Build a source chain

Challenge → feature/action → function → possible survival benefit → source

For a plant, use a verified structure/growth response.

For the animal, include one sourced behaviour. Avoid inferred interventions.

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au); Based on: Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au)

A careful comparison

Both organisms have useful structures. Their structures meet different challenges.

A platypus folds webbing for land movement; pigface can grow to two feet
sand cover.

A plant growth response is not a conscious choice.

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au); Based on: Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au)

Draft with evidence

Use W08 and A1. Select a plant and an animal from the case cards.

Explain a structure for each, one sourced animal behavior, evidence on in and a meaningful limit.

Keep model results separate.

PREVIEW

A fictional community choice

A school proposes a litter-prevention campaign beside a local creek.

Compare it with an unsupervised student trapping survey.

Which action is safer and scientifically justified? What approval/evidence is needed?

PREVIEW

Use science for a decision

Taronga identifies pollution, habitat damage and trapping risks for platypus.

Reducing litter may help protect freshwater habitat.

A campaign alone cannot prove the whole creek is cleaned up.

PREVIEW

Based on: Taronga Zoo – Platypus (taronga.org.au)

Check effects and uncertainty

Who is affected? What do we know? What remains uncertain?

Prefer preventing litter at school and reporting concerns to adults

No student enters water, handles wildlife or removes habitat.

PREVIEW

Improve the draft

Partner checks: is every function sourced? Is one claim too broad?

Use fewer cards or a spoken/drawn explanation if helpful.

Challenge: identify missing evidence for the proposed claim.

PREVIEW

Check readiness

Show evidence for structures, behaviour and environment.

Name your model limit and a justified safe community choice.

These records become part of your assessment portfolio.

PREVIEW

PREVIEW

We Done!
Lesson 3: Build the comparison



PREVIEW

Built to Survive
Year 5
Lesson 9 Survival-science conference



Our learning

Present and defend an evidence-based explanation.

Respond to a changed-habitat question for a named evidence.

PREVIEW

Prepare the evidence

Choose two organisms: one animal and one plant.

Bring C1–C8, your comparison and model record.

Separate source facts, classroom results and evidence.

PREVIEW

A worked conference reply

“Webbing helps a platypus swim; Taronga supports that function. If a creek dries, webbing cannot replace water or food.

The benefit depends on suitable habitat.”

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au)

Transfer, not a magic fix

New question: What if loose sand covers pigface stems?

Use C6's sourced growth response, then name an uncertainty about its validity or timing.

Do not promise that any amount of sand is harmless

PREVIEW

Based on: Australian National Botanic Gardens — *Carpobrotus glaucescens* (anbg.gov.au)

Choose your audience

Explain for another Year 5 class or the school environment group.

Define a technical word and keep your claim clear.

Show the source card rather than relying on a computer voice.

PREVIEW

Conference structure

Claim: what helps and in which environment?

Evidence: which source or model result?

Reasoning: how are they connected?

Limit: what is uncertain outside the evidence?

PREVIEW

Ask a useful question

What supports that function?

What can your model show?

What other evidence is needed?

Respect a different response mode and allow thinking time

PREVIEW

Your assessment response

Complete A1 page 2 using writing, labels, speech, recording, gestures supported choices.

Use the same reasoning criteria.

Neatness, speed or number of speaking confidence are not assessed.

PREVIEW

Review a challenge

Answer the habitat-change prompt using your chosen source.

Identify a possible method error and a model limit.

Explain a contribution from different scientific expertise.

PREVIEW

Check your explanation

Does the evidence support your exact claim?

What would make you revise it?

Keep the final comparison and conference evidence together.

PREVIEW

PREVIEW

Well Done
Lesson 9: Survival Science
conference



PREVIEW

Built to Survive
Year 5
Lesson 10: Conservation application



Our learning

Recommend a safe, evidence-informed habitat-care action.

Explain likely effects, uncertainty and collaboration.

PREVIEW

Retrieve needs and limits

Choose one organism. Which environment and sourced feature matters?

A helpful adaptation does not protect an organism from every human-induced change.

PREVIEW

A real science partnership

Taronga, UNSW and San Diego Zoo Wildlife Alliance combine evidence on platypus conservation.

Research helps decisions about rescue, trigger and population management.

Do not describe our research as their research.

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au)

What expertise adds

Ecological research describes habitat pressures; genetic and reproductive work informs population care.

Earlier findings help teams ask better questions.

Explain one contribution and one thing a new team might miss.

PREVIEW

Based on: Taronga Zoo — Platypus (taronga.org.au)

Community decision scenario

Fictional school options: prevent litter leaving the grounds, collect risk creek samples alone, or remove riverside plants.

Compare likely effects, risks, evidence and needed approvals.

PREVIEW

A justified recommendation

Prefer safe litter prevention and adult reporting of habitat concerns.

Taronga links litter reduction to river-species protection.

A school action is useful but cannot prove population recovery.

PREVIEW

Based on: Taronga Zoo – Platypus (taronga.org.au)

Plan the action

Use W10: action, organism need, source, likely effect, uncertainty and way to review.

Observe school litter from an accessible dry area daily.

Adults manage any household waste or external activities.

PREVIEW

Communicate to the school

Make a concise spoken, written or labelled proposal for the school environment group.

Use factual language and one source.

Do not promise an outcome you cannot measure.

PREVIEW

Complete the learning evidence

Show the two-organism comparison, practical/source record, model limit, collaboration explanation and community decision.

Use R1 to locate one strength and one next step.

PREVIEW

Final reflection

What did the evidence change in your thinking?

How can responsible science help a community decide

No harmful test is needed to explain an organism's survival needs.

PREVIEW

PREVIEW

We Done!
Lesson 10 Conservation application



PREVIEW

Built to Survive
Year 5
Unit Quiz



How to respond

Think, discuss, write, point, draw or use a communication device.

Give evidence and a reason.

Practice records are labelled illustrative

The quiz supports the portfolio it is not the sole assessment

PREVIEW

I. Choosing a feature

Does a platypus choose to grow webbed feet because it needs to swim? Explain.

PREVIEW

Answer 1 – reasoning

No. Structural adaptations are inherited features shaped over generations, not conscious choices.

PREVIEW

2. The bill's function

How does the bill help a platypus find food?

PREVIEW

Answer 2 – reasoning

Its electroreceptors detect electrical signals from moving prey underwater. It is not a battery or human eye.

PREVIEW

Based on: Taronga Zoo – Platypus (taronga.org.au)

3. Structure or behaviour?

Classify: webbing on a foot; folding webbing while on land.

PREVIEW

Answer 3 – reasoning

Webbing is a structure. Folding it is a behaviour. Taronga describes both in context.

PREVIEW

Based on: Taronga Zoo – Platypus (taronga.org.au)

4. A plant feature

How do pigface's rooting stems relate to coastal dune conditions?

PREVIEW

Answer 4 – reasoning

Trailing stems root at nodes and spreading pigface helps bind loose sand. Do not infer every leaf function from appearance.

PREVIEW

Based on: ANBG — *Carpobrotus glaucescens* (anbg.gov.au)

5. A fair method

A group changes cup size and adds felt. Can it isolate the effect of felt on improvement of the plan.

PREVIEW

Answer 5 – reasoning

No. Keep cup type, water volume, start temperature, room, times and then keep the same; change the side sleeve only. Use separate repeated cup

PREVIEW

6. Interpret a record

Illustrative model data only: at 0 and 10 min, wrapped 12 → 16 °C; unwrapped 12 → 19 °C. Compare the changes.

PREVIEW

Answer 6 – reasoning

Wrapped rose 4 °C; unwrapped rose 7 °C. The sleeve slowed warming in this example. These are practice data, not class observations for animal research.

PREVIEW

7. Scientific collaboration

How is the Taronga partnership more than ordinary group work?

PREVIEW

Answer 7 – reasoning

Different ecological, genetic and reproductive expertise and earlier findings contribute evidence to conservation decisions. Our classroom model is so simple.

PREVIEW

Based on: Taronga Zoo – Platypus (taronga.org.au)

8. Model limits

A cup test changes warming. Does it prove every animal survives better with a thicker covering?

PREVIEW

Answer 8 – reasoning

No. Cups lack living tissues, metabolism and behaviour. Conditions differ; a model result cannot establish animal survival or evolution.

PREVIEW

9. Changed habitat

Transfer: if a creek dries, do webbed feet solve the platypus's whole problem?
Explain with a limit.

PREVIEW

Answer 9 – reasoning

No. Webbing helps swimming when water is available. It cannot replace freshwater habitat or food. Survival requires more evidence about conditions.

PREVIEW

Based on: Taronga Zoo – Platypus (taronga.org.au)

10. A community choice

Fictional school proposal: prevent litter or set wildlife traps without an exper

Recommend a safe action and name uncertainty

PREVIEW

Answer 10 – reasoning

Choose litter prevention and adult reporting; no trapping or handling. This may reduce a habitat pressure but does not prove the creel or population has recovered.

PREVIEW

Based on: Taronga Zoo – Platypus (taronga.org.au)

Reflection

Which idea changed? What evidence helped?

Use your practical/source portfolio to show the complete learning.

The quiz is one check; it does not replace inquiry evidence.

PREVIEW

PREVIEW

We Done!
Explain with evidence

