



Backbone evidence lab

Autumn 1 · Week 3 · Lesson B · 40 minutes

Learning objective

Use body clues to classify animals, test a first idea and construct a diagnostic clue card.

Evidence to look for

Record the pupil decision or explanation and the support used. Accept pointing, signing, adult scribing or directing the model. A photograph alone does not establish understanding; no photography or public sharing is required.

Source lesson timing

Elapsed minutes	Source stage	Minutes
0–32	Independent Work	32
32–36	Lundy Loop	4
36–40	Exit Ticket	4

Split slide times are added within their original source stages. Printed tasks and adaptations replace activity within these timings; they do not add extra lesson time.

Equipment and preparation

- Monday animal labels and saved classification mat
- Four original body-evidence case cards
- Blank mystery card, pencil or adult scribe; loose group labels

**TEACHING SEQUENCE**

Guide the lesson

Use the source stage times; choose prompts appropriate to the pupil.

Slide 1: Backbone evidence lab · 0 minutes

Wednesday P2, 10:10-10:50. Reference screen only; start the 32-minute workshop immediately. No additional starter or lesson time.

Slide 2: Return to Monday's rule · 4 minutes

Source preparation phase, four minutes. Retrieve Monday's eight-animal vocabulary: fish, bird, frog, lizard, mouse, snail, crab, earthworm. The first five have backbones; last three do not. Do not replace evidence with guessing from fur/size. Adult can read and cut.

Slide 3: Goldfish and bat: use body clues · 5 minutes

First five minutes of source 20-minute investigation. Hide each clue initially and record first idea; then reveal clue and classify. Both are vertebrates. Wings do not decide classification; evidence of backbone does. Pupil can leave prediction unsure until evidence is available.

Slide 4: Beetle and earthworm: compare · 5 minutes

Next five minutes. Both are invertebrates but support differs. Beetle exoskeleton is a hard outside; earthworm support comes from muscles/fluid. Explain that no backbone does not mean no support. Native text comparison replaces source illustration; no live animals or handling.

Slide 5: Make a two-clue mystery card · 5 minutes

Next five minutes. Adult can write pupil-dictated clues. One clue must discriminate backbone presence/absence: e.g. internal bones include a backbone, or hard outer case and no backbone. "It is small" alone cannot settle it. Keep hidden answer on the teacher side, not pupil public display.

Slide 6: Test the clue, then explain · 5 minutes

Final five minutes of 20-minute investigation. No compulsory peer audience. A useful card need not identify the exact species; it should allow group classification. If solver guesses from size, ask author to improve body evidence. Adult notes pupil reasoning and support used.



TEACHING SEQUENCE / CONTINUED

Guide the lesson - continued

Keep the source stage times; pause and check understanding as needed.

Slide 7: Pause and check the rule · 2 minutes

Source two-minute check is included in 32, not extra. Ask whether the card distinguishes internal backbone from shell/outer case/fluid support. Let the pupil change an uncertain classification in response to evidence.

Slide 8: Improve one clue and save it · 4 minutes

First four minutes of final six-minute source phase. Example improvement: “hard body” becomes “hard case outside and no internal backbone.” A pupil can point to the right existing evidence sentence instead of composing text. Retain reasoning, not only a photograph.

Slide 9: Leave the evidence ready · 2 minutes

Final two minutes of 32-minute workshop. Adult can label work without gathering any extra personal information. Store within normal classroom arrangements; no upload or public audience needed.

Slide 10: Your voice can change the lesson · 4 minutes

Four minutes within the source lesson. Receive an actual observation or access request; do not force a peer audience. Name what can change now, make the change where possible and check whether it helped. The adult receives and names back the science shown as well as access feedback.

Slide 11: Show the science you can explain · 4 minutes

Offer one route, not three compulsory questions. Answers stay in teacher notes: supported fish/bird/frog/lizard/mouse/bat; standard crab has hard outer case but no internal backbone; stretch tiny mouse has backbone while larger crab/lobster lacks one. Adult receives explanation, names back understanding and records a feasible next teaching step.

**TEACHER ANSWERS**

Worked answers and expected evidence

Use after an attempt. Accept equivalent correct explanations; record support given.

1. Predict, reveal, classify

Goldfish and bat are vertebrates. Beetle and earthworm are invertebrates. Changes are justified by body evidence, not by appearance.

2. Make and test a mystery card

At least one clue should explicitly establish backbone presence/absence. Example: "It has a shell. Its body has no backbone" supports invertebrate. Exact species identification is optional; scientific group reasoning is the purpose.

3. Improve your evidence

Accept a meaningful revision: small/furry/legs replaced or supplemented with an internal-backbone clue. Retain before-and-after evidence; changing a correct label is not required.

4. Feedback and exit

Accept fish/bird/frog/lizard/mouse/bat for backbone; crab has no backbone despite hard outer case; size counterexample can compare tiny mouse with large lobster/crab. Adult receives the explanation and chooses a next step.

Misconceptions and corrections

- Earthworm rings are bones: they are external segments, not an internal backbone.
- A beetle's hard case makes it a vertebrate: the backbone criterion still fails.
- A useful clue merely describes size: body support evidence is needed.



Teach safely; keep the evidence

The source record identifies this conversion; it is not a claim of publication.

Safety

- Paper models only; no animal collection, touching animals or checking pupils' spines.
- Adult reads and cuts as needed; pupil can direct or point.
- No requirement to work with a peer, show a body part, take photos or share work publicly.

Access and offline alternatives

- Use an adult reader and two group labels; point to one decisive body clue.
- Classify all four cases, explain a choice and make a two-clue card.
- Test and improve a clue so appearance cannot mislead the solver.
- Adult receives one real pupil observation or access request, acts on a feasible change and explains limits. A learner can pass privately.

Close and continue

Finish at 40 minutes: workshop 32, pupil feedback 4, exit 4. Record one next teaching step based on the actual response.

Source and revision

Repository: [MattRoper1977/Lessons](#)

Source path: [Science_Teesside/Build/SCI_B_W3_Backbones.html](#)

Source file Git blob: [349b5b8637ba978dd594f77d80fbd7998dac1ff2](#)

Current source link (mutable): https://github.com/MattRoper1977/Lessons/blob/main/Science_Teesside/Build/SCI_B_W3_Backbones.html

Document revision: 2026-09-06

Uploaded supporting sources

- White Rose Education, Year 3 Autumn Block 1 (2024): Skeletons, steps 3-5; uploaded source lessons about animal bones, animals with/without a spine and comparing skeletons. Steps 1-2 provide optional prerequisite vocabulary; they are not relabelled as completed baseline teaching.

Recorded conversion changes

- Original editable classroom text, scientific diagrams and pupil tasks follow the current weekly HTML, not the older retained A/B teaching version.
- White Rose uploads inform concepts and task choices; no publisher-owned slide, photograph, worksheet page or video is redistributed in these public files.
- Website animations and drag-and-drop controls become teacher-led reveals, movable paper labels and accessible spoken/drawn responses. No internet connection or video is needed.
- Autumn 1 Weeks 1-2 were baseline assessment. This is a Weeks 3-7 teaching pack, not a claim that baseline assessments or the separate Week 8 enrichment are included.