



Backbones and no backbones

Autumn 1 · Week 3 · Lesson A · 40 minutes

Learning objective

Classify animals using evidence of an internal backbone, and explain why size, fur or legs are not reliable tests.

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
0–1	Overview	1
1–5	Arrival Task	4
5–7	Today at a Glance	2
7–12	I Do 1	5
12–16	I Do 1b	4
16–22	We Do 1	6
22–26	We Do 1b	4
26–30	I Do 2	4
30–40	We Do 2	10

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

- Original printed animal/body-clue cards and vertebrate/invertebrate labels
- Pupil record, pencil or movable answer labels
- Optional adult pointer for the native backbone schematic



TEACHING SEQUENCE

Guide the lesson

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

Slide 1: Backbones and no backbones · 1 minute

Monday P3, 11:00-11:40. This one-minute overview is included in the 40-minute lesson.

Slide 2: Start with your own idea · 4 minutes

Do not claim pupils learnt bones in Weeks 1-2: these were baseline weeks. Supported: offer fish/snail labels and read aloud. Standard: name an animal and predict. Stretch: name one possible example in each group. No checking of pupils' own spines.

Slide 3: Three things we will do · 2 minutes

Read the goal and introduce backbone, vertebrate and invertebrate orally. Pupils may point, sign, dictate or use an adult reader. This is the current Monday sequence; practical clue-card investigation is reserved for Wednesday.

Slide 4: Look for bones inside · 5 minutes

Original native schematic of a short section of backbone, not a complete animal skeleton or diagnostic image. Trace the sequence of small bones with a pointer. A fish has an internal backbone even though it has no legs. Explain that pictures alone may hide internal structures; we use the stated body evidence.

Slide 5: A hard outside is different · 4 minutes

Read a body-evidence card for each animal. A crab's hard exoskeleton supports/protects it but is not an internal backbone. Invertebrate does not mean soft, small or unsupported. An earthworm can use muscles and fluid support. No live animals needed.

Slide 6: Decide before the explanation · 3 minutes

Read each body clue, allow processing time and collect each pupil's choice before confirming. Fish/frog = vertebrate; snail = invertebrate. Optional verbal clues and movable labels replace online animation. Ask which evidence made the decision possible.



TEACHING SEQUENCE / CONTINUED

Guide the lesson - continued

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

Slide 7: Try the rule again · 3 minutes

Mouse = vertebrate; crab/earthworm = invertebrate. The tiny mouse counters size-based guessing. Explain that a shell or outer case is useful support but is not a spine. Correct the rule gently rather than describing a pupil as wrong.

Slide 8: Different outsides, same test · 4 minutes

Ask pupils to identify the shared evidence. Contrast a mouse and a large lobster if helpful: body size cannot decide the group. Use these four named examples; do not infer classifications from appearance alone.

Slide 9: Use because to show your reason · 4 minutes

Model the source evidence loop. Supported: point to group and backbone clue; adult repeats pupil meaning. Standard: complete because sentence. Stretch: contrast why a hard outer case would not prove a backbone. A recorded pupil explanation is stronger evidence than a photo of a sort alone.

Slide 10: Sort the evidence cards · 5 minutes

Worksheet supplies body evidence for each animal. Bat/snake = vertebrate; crab/jellyfish = invertebrate. The only reliable diagnostic criterion among these three is internal backbone. Size and fur are not universal tests. Let pupils place or direct labels before reveal; this is an original paper version of the source classification activity.

Slide 11: Check one choice and keep it · 5 minutes

Five minutes completes source ten-minute We Do 2. Include checking rather than additional timed exit. Ask whether size, fur or legs prove the claim; they do not. Learner can pass or speak privately. End Monday here, retaining one explanation and the sort for the Wednesday evidence workshop.

**TEACHER ANSWERS**

Worked answers and expected evidence

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

Backbone rule

Vertebrate = animal with a backbone. Invertebrate = animal without a backbone. Different forms of support do not change this criterion.

1. My first idea

Prediction is not a test score. Accept uncertainty. Do not assume any baseline pupil learnt the answer before this lesson.

2. Use the body evidence

Fish, frog and mouse are vertebrates; snail, crab and earthworm are invertebrates. Use internal backbone as the criterion. Fluid support is sufficient for this simplified earthworm example.

3. Which clues count?

Bat and snake = vertebrate; crab and jellyfish = invertebrate. Wings, legs, fur and size do not decide the definition.

4. My evidence explanation

Accept the scientific classification linked to presence/absence of internal backbone. For example: snake is a vertebrate because it has a backbone even though it has no legs. A changed idea shows response to evidence.

Misconceptions and corrections

- Small animals lack backbones: a mouse is small and has one.
- A shell or outer case is a backbone: a crab has an exoskeleton but no backbone.
- No legs means no backbone: snakes have an internal backbone.



Teach safely; keep the evidence

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

Safety

- Use paper models only; do not touch live animals or pupils' spines.
- Adult reads/cuts cards if needed; offer pointing, dictation or directing.
- No compulsory body display, public sharing or photography.

Access and offline alternatives

- Use a choice of two labelled groups with an adult reader; point to the body clue.
- Classify the supplied animals and explain one choice using because.
- Use the rule on a bat/snake case and explain why size, fur or legs are unreliable.
- 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. Keep named cards and records for Wednesday Week 3; do not start the workshop early.

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.