Fossils Tell Us Living Things Changed

Teacher		**Class**	Year 6
Subject	Science	**Topic**	Evolution and fossils
Date		**Room**	
Lesson length	60 minutes	**Country**	United Kingdom

Students learn that living things changed over millions of years. They study fossil clues to infer what ancient life looked like.

Curriculum links

- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago [2]

Learning objectives

- Students will recognise living things changed over millions of years.
- Students will explain what fossils reveal about ancient living things.
- Students will describe in order how fossils form in rock.

Success criteria

- I can explain that living things have changed over time.
- I can describe what a fossil tells us about the past.
- I can say how a buried living thing becomes a fossil.

What students already know

Ask: What is a fossil and where would you find one. Listen for remains in rock from long ago.

Key words

fossil	remains or marks of ancient living things kept in rock [3][4]
evolution	very slow change in living things over millions of years [3]
extinct	when no living members of a kind are left alive [4]
ammonite	curly-shelled sea animal that lived millions of years ago [4]

Materials

- Slides 1-7, 9-12
- Video clip 1 (0:00-1:06) on slide 6
- Worksheet Task F picture cards - one set per group
- Worksheet Task A flow chart - one per student
- Printed fossil photo cards showing ammonite, leaf imprint and footprint
- Notebooks, pencils, mini whiteboards

Before the lesson

- Print Worksheet Task F cards and Worksheet Task A flow charts
- Load slides 1-7 and 9-12 and test Video clip 1 (0:00-1:06) with sound
- Set out fossil photo cards, notebooks and whiteboards for groups
- Put three example cards at front: ammonite shell, leaf imprint, footprint trail

Lesson outline

0–7 min **Starter** 7 min · Whole class

Hook curiosity about fossil clues and revisit the idea of change over time.

YOU DO

1. Show Slide 1 Fossils: Life from Millions of Years Ago and read the title.
2. Say the hook and show one footprint picture to spark curiosity.
3. Show Slide 2 Today we will and read the three aims in your own words.
4. Ask what students already know about fossils and dinosaurs.

STUDENTS DO

1. Look at the footprint picture and suggest what made it.
2. Share one thing they think a fossil can tell us.
3. Listen to the aims for the lesson.

Say: You are the palaeontologist and this rock is your only witness. What happened. Today we will work out what fossils tell us about living things that lived millions of years ago.

Ask: What do you think a fossil is? (Remains or traces of ancient life saved in rock.) · Why might living things long ago look different from today? (Because living things have changed over millions of years.)

Check understanding: Thumbs up if you can say what we are finding out today. If unsure, repeat the two aims with actions: changed and tells us.

Support: Show the footprint picture again and offer choices: water or land, plant or animal. **Stretch:** Ask what other mark, besides a bone, could still tell us an animal was there.

Use: Slides 1-2

7–20 min **Teaching** 13 min · Whole class

Explain in order how living things become trapped and turn into fossils.

YOU DO

1. Show Slide 3 How a fossil forms and talk through the steps in order.
2. Explain burial in sand and mud and why hard parts last longer.
3. Play Video clip 1 (0:00-1:06) on Slide 6. Ask students to spot what buries first and what lasts longest.
4. Model the four-step story with hand actions: dies, buried, decays, turns to stone.

STUDENTS DO

1. Watch the clip and call out what buries the animal and what lasts.
2. Copy the four actions and say the steps in order with a partner.
3. Point to oldest at bottom and youngest at top on a drawn rock stack.

Say: Most fossils start when a living thing dies in the sea, lake or river and is quickly buried by sand and mud. The soft parts decay away but hard shells and bones stay and minerals slowly turn them to stone. Fossils are typically found in sedimentary rocks [3].

Worked example: A curly ammonite dies in the sea [3]. Step 1 burial: sand and mud cover it quickly. Step 2 decay: soft body decays, hard shell stays because hard body parts such as bones and shells do not decay easily [4]. Step 3 stone: minerals replace the shell and it is literally turned into stone [3]. Step 4 discovery: we find the shell in rock millions of years later.

Ask: What buries the body first and why does that matter? (Sand and mud bury it quickly, which protects it so it can become a fossil [3].) · Which parts last longest? (Hard parts such as bones and shells because they do not decay easily [4].) · Where are fossils typically found? (In sedimentary rocks [3].)

Check understanding: Hold up whiteboards with the four words in order: dies, buried, decays, stone. Reteach any missing step with Slide 3 if order is wrong.

Support: Give a three-box strip with the words bury, press, rock to sequence and point to each while you say it. **Stretch:** Ask what would happen if a second shell was buried in a higher, younger layer much later.

Use: Slides 3, 6; Video clip 1 (0:00–1:06)

20–40 min **Main activity** 20 min · Groups

Infer what past living things looked like and where they lived from fossil clues.

YOU DO

1. Show Slide 4 and explain curly ammonites swam in the sea and became extinct about 65 million years ago [4].
2. Show Slide 5 mystery footprints and Slide 7 Two kinds of fossil clues. Explain body fossils show the body and trace fossils show movement.
3. Model one card: think aloud what it was, where it lived, what has changed.
4. Give out Worksheet Task F and fossil photo cards and set the group task and time.

STUDENTS DO

1. Study each fossil card with a magnifier look and discuss habitat, size and movement.
2. Write in notebooks three ideas for each card: what it was, where it lived, what changed.
3. Prepare to share two cards and justify body fossil or trace fossil.

Say: In groups you are the palaeontologist. Study each card and decide what it was, where it lived, and what has changed compared with today. Body fossils are hard bones, teeth and shells. Trace fossils are footprints, burrows and roots [3].

Worked example: Card: curly ammonite shell. Step 1 what it was: a sea animal with a hard curly shell, now extinct [4]. Step 2 where it lived: in the sea because the shell is like shells of sea animals today. Step 3 what changed: this exact animal no longer swims in our seas, which shows living things have changed and fossils provide information about living things that inhabited the Earth millions of years ago [2]. By studying fossils scientists can learn how much organisms have changed [4].

Ask: Is this a body fossil or a trace fossil, and how do you know? (Bone, teeth and shells are body fossils; footprints, burrows and rootlet traces are trace fossils [3][4].) · What does this fossil tell us about long ago? (What lived there, where it lived, and that life was different from today.) · Why do fossils of the simplest living things sit in the oldest rocks? (Because fossils of the simplest organisms are found in the oldest rocks and more complex ones in newer rocks [4].)

Check understanding: Visit each group and ask them to point and say body or trace plus one clue. If unsure, return to Slide 7 and sort two examples together.

Support: Give clue questions: Did it live in water or on land? Was it plant or animal? What shape do you see?
Stretch: Ask students to explain how the work of palaeontologists such as Mary Anning [2] helps us piece together many single finds.

Use: Slides 4-5, 7; Worksheet Task F

40–50 min **Practice** 10 min · Pairs

Record the fossil sequence and link it to slow change over time.

YOU DO

1. Show Slide 9 Your task and explain the four boxes: burial in mud, decay, turning to stone, discovery.
2. Show Slide 10 Key words and read fossil and evolution meanings together.
3. Model the first two boxes of Worksheet Task A flow chart on the board.
4. Set pairs to finish Task A and add one label per box.

STUDENTS DO

1. Complete Worksheet Task A flow chart in pairs.
2. Add one short label in each box and one sentence underneath about change.
3. Check key words spelling: fossil, evolution, extinct.

Say: Draw the story in order and add one short label in each box. Underneath, write what it tells us about long ago. Use the key words fossil and evolution to help your sentence.

Worked example: Box 1 burial: animal covered by mud. Box 2 decay: soft parts decay, shell stays. Box 3 stone: minerals turn it to stone. Box 4 found: fossil in rock shows life very different from today. Sentence underneath: Living things have changed over time because the fossil shell is different from animals alive today [2].

Ask: What must happen right after the animal dies for a fossil to form? (It must be quickly buried by sand and mud [3].) · How does your finished strip show evolution? (It shows a living thing from millions of years ago that is different from living things today.)

Check understanding: Swap strips with another pair to check order and labels. Fix order on the board if many miss decay or stone stage.

Support: Give sentence starters: First it was buried by... Then the soft parts... The hard parts turned to...
Stretch: Ask pairs to add why soft bodies rarely fossilise and what that means for gaps in evidence.

Use: Slides 9-10; Worksheet Task A

50–60 min **Plenary** 10 min · Whole class

Return to the aims and check what fossils tell us about change.

YOU DO

1. Show Slide 11 Vote: best fossil find and take a quick class vote with reasons.
2. Show Slide 12 Exit ticket and ask students to finish the two sentences on paper.
3. Take three answers linking fossil evidence to change over time.
4. Restate the lesson idea: fossils are our witness to change.

STUDENTS DO

1. Vote for huge bone, tiny ammonite or footprint trail and give one reason.
2. Write exit sentences: one fact and one explanation of change.
3. Share answers with a partner and then with the class.

Say: If you could find one fossil, which would you pick and why. Now write one fossil fact you learnt and finish the sentence about why living things have changed over time.

Ask: What is one fossil fact you learnt today? (For example, ammonites became extinct about 65 million years ago [4].) · How do fossils show living things changed? (Fossils in rocks of different ages show different living things, and study shows how much they changed [4].)

Check understanding: Read three exit slips aloud. If explanations are weak, repeat: fossils provide information about living things millions of years ago [2].

Support: Offer word bank: feathers, wings, beak, teeth, size, legs, shell, footprint, extinct. **Stretch:** Ask why having feathers might be useful even before an animal could fly.

Use: Slides 11-12

Common mistakes

Mistake	How to spot it	How to fix it
Thinking only big bones count as fossils.	Students call footprints just marks, not fossils.	Remind that footprints, burrows and roots are trace fossils left in sediment [3], and body fossils are bones, teeth and shells [3].
Thinking living things always looked as they do now.	Students say the ammonite still lives in the sea today.	Stress that ammonites became extinct about 65 million years ago [4] and fossils show life very different from today [2][4].
Thinking soft and hard parts fossilise equally well.	Students expect leaves and jelly-like bodies to fossilise like shells.	Explain hard parts do not decay easily [4] but soft-bodied forms left few traces, which leaves gaps [4].

Support

- Use picture prompts, word banks and clue questions about water or land and plant or animal.
- Pre-teach fossil, evolution and extinct with real card examples.
- Pair less confident students with a buddy to scribe while they point and explain.

Stretch

- Predict what a higher younger layer with a different fossil would tell us about age.
- Explain what the same ammonite in two far-apart rocks tells us about age and past seas [3].
- Discuss how Mary Anning style piecing of many finds builds the story of change [2].

For the LSE or teaching assistant

Stay with target groups in the main Task F activity. Use the clue questions, help them sort body or trace, and scribe their three ideas if writing is slow.

Check for understanding

Question	Answer
Name one way a fossil can form in rock.	Quick burial by sand and mud, soft parts decay, hard parts turned to stone by minerals [3][4].
Is a dinosaur footprint a fossil and what does it tell us?	Yes, a trace fossil [3]; it tells how it lived and moved, not what its bones looked like.
How do fossils show living things changed over time?	Fossils provide information about living things millions of years ago [2]; simplest in oldest rocks and more complex in newest rocks shows change [4].

Homework

Sketch your Task F favourite fossil and write two sentences about what it tells us.

Sources

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