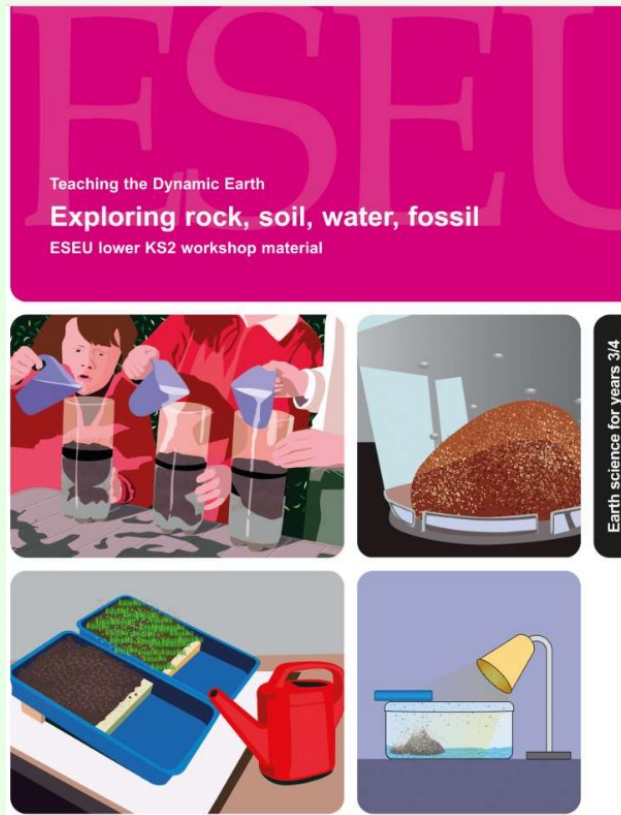


Exploring rock, soil, water, fossil – online

For ages 7 to 9 (UK -lower KS2)



Developed from
the Earth
Science
Education Unit
'Exploring, rock,
soil, water, fossil'
workshop, with
permission

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Earthlearningidea online video workshops

Purpose – ESEU background

- Most Earthlearningidea online video workshops are based, with permission, on workshops originally developed by the Earth Science Education Unit (ESEU)
- These were designed as interactive workshops for teachers and trainees, involving interaction, discussion and presentations by participants to others
- Global research into professional development workshops shows that these aspects are critical to success
- ESEU research shows that this workshop approach is highly successful in changing teaching in schools; evaluation feedback has also been very strong

Earthlearningidea online video workshops

Purpose – Earthlearningidea development

The Earthlearningidea Team has developed the ESEU workshops into online video workshops for those unable to take part in face to face interactive workshops

Each workshop is led by a PowerPoint presentation and has an accompanying booklet that contains all the activity background details, resource lists, risk assessments, etc.

The individual workshop activities have been published for open access online at the website:

<https://www.earthlearningidea.com/>

Each workshop activity has a question script and a video keyed into CASE principles, that can be accessed through the PowerPoint hyperlinks

The aim is to facilitate online Earth science learning

Earthlearningidea online video workshops

Teaching Earth science using the Cognitive Acceleration through Science (CASE) approach

- The activities in this workshop are keyed into the CASE approach – to develop thinking skills while teaching key Earth science material
- If you are unfamiliar with the CASE approach, you can access a video introduction at:
<https://www.earthlearningidea.com/Video/CASE.html>
- An exemplar Earth science teaching activity with a question script using the CASE approach is at:
https://www.earthlearningidea.com/Video/Atmosphere_ocean.html

Earthlearningidea online video workshops

Running Earthlearningidea online video workshops

Each workshop is led by a PowerPoint presentation

Launch the PowerPoint

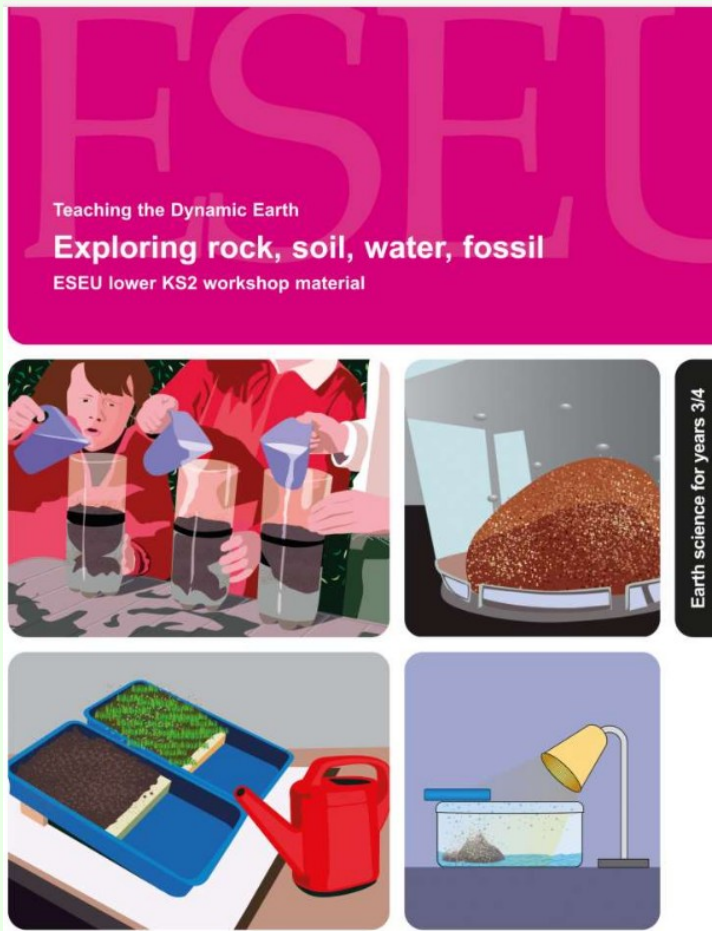
Some slides contain hyperlinks to MP4 video files

Run the hyperlinked files and then return to the PowerPoint, flick through any slides you have already seen, and continue

The workshop is presented in this way so that the workshop itself, or individual videos, can be used in classroom teaching

Exploring rock, soil, water, fossil

Video run times	m	s
<i>Starter:</i> Found in the ground	8	33
A rocky look, touch, tell	16	14
Will my rock hold water?	10	32
The soil water shake test	7	29
Make your own soil	5	59
The great soil race	8	39
Changing state – transforming water	5	23
Make your own rain	9	41
Fossil or not?	9	07
<i>Plenary:</i> What was it like to be there? - bringing fossil to life	6	41
<i>Optional:</i> Save our soil	7	40
<i>Optional:</i> Soil doughnuts	10	20
<i>Optional:</i> Will my gravestone last?	33	20



Exploring rock, soil, water, fossil

Earth science
for lower KS2,
Years 3/4

The workshop is based on this pdf booklet originally prepared by the Earth Science Education Unit and now available on the [Earthlearningidea](http://Earthlearningidea.com) website. It contains a workshop summary, the outcomes, teacher guidance, risk assessments and resources lists – as in the following slides

Exploring rock, soil, water, fossil

Summary

Try a series of 'hands-on' activities to describe, classify and identify rocks, investigate soils, explore the changing states of water, with their links to the water cycle, and find out what fossils can tell us. Have a go at the 'Great soil race', making your own rain, bringing a fossil to life and much more through a range of practical and investigative activities.

Exploring rock, soil, water, fossil

Workshop outcomes

The workshop and its activities provide the following outcomes:

- insights into how rocks can be; sorted, classified and identified most effectively;
- opportunities to investigate soils through a range of activities;
- an approach to understanding the different states of water and how these link to the water cycle;
- an introduction to fossils and what they can tell us about life in the past;
- practical activities that develop skills of investigation, discussion, argumentation and creativity;
- background information on some of the Earth science processes active in the UK;
- exploration of the elements of science and geography that provide the underpinning to later Earth science study;
- guidance on how the elements of Earth science in the curriculum can be taught most effectively.

Exploring rock, soil, water, fossil

Explore the Earth using this wide range of activities:

Note: those practical activities needing apparatus/materials are shown with a *

Starter: Found in the ground

Circus activity 1: A rocky look, touch and tell*

Circus activity 2: Will my rock hold water?*

Circus activity 3: The soil water shake test*

Circus activity 4: Make your own soil*

Circus activity 5: The great soil race*

Circus activity 6: Changing state - transforming water*

Circus activity 7: Make your own rain*

Circus activity 8: Fossil or not?

Plenary: What was it like to be there? – bringing a fossil to life

Optional activity: Save our soil*

Optional activity: Soil doughnuts*

Optional activity: Will my gravestone last?

* risk assessment

Exploring rock, soil, water, fossil

Carry out *risk assessments* before the following activities:

The soil water shake test

The great soil race

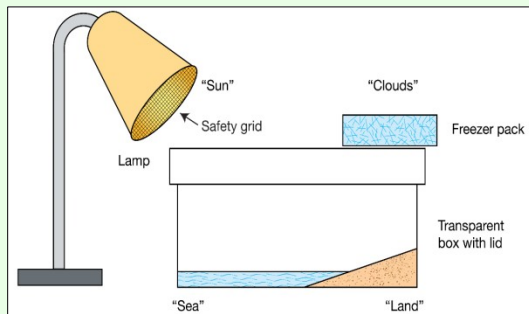
Make your own soil

Make your own rain

Save our soil

Soil doughnuts

Will my gravestone last?



Exploring rock, soil, water, fossil

Starter: Found in the ground



Go to video hyperlink:

https://www.earthlearningidea.com/Video/Pr_Found_in_ground.html

Exploring rock, soil, water, fossil

Starter:
Found in
the ground
- helpful cards

Pupil success criteria card (Found in the ground)

Sort them out

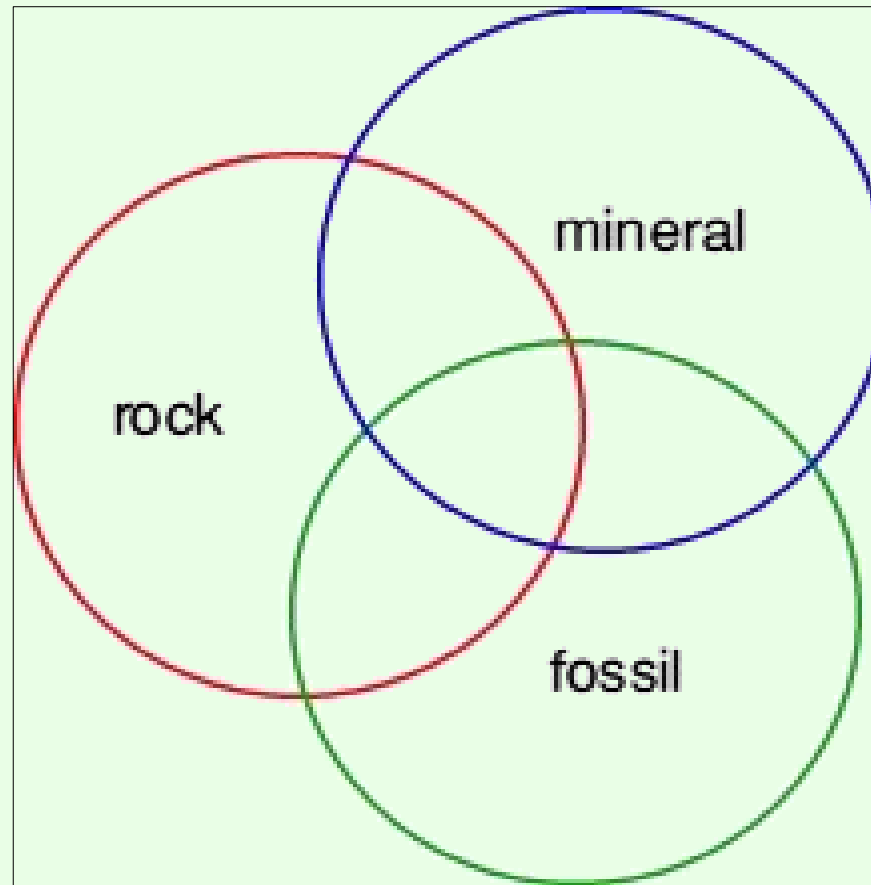
To do this in the best way, you will:

- 1) Group the samples into about two or three 'categories' with at least two things in each 'category';
- 2) Not have a group which is made of 'things that couldn't be fitted into the other groups';
- 3) Make your choices based on the properties of the samples

Rock natural and made of 'bits' called grains		Non-rock may or may not be natural and are usually not formed of 'bits'
Mineral natural chemicals with the same properties all the way through		Fossil any preserved sign of past life more than 10,000 years old

Exploring rock, soil, water, fossil

Starter: Found in the ground – using the Venn diagram approach



Exploring rock, soil, water, fossil

Circus activity 1: A rocky look, touch and tell



Go to video hyperlink:

https://www.earthlearningidea.com/Video/Pr_Rocky_look_touch_tell.htm

Exploring rock, soil, water, fossil

Circus activity 1: A rocky look, touch and tell – helpful cards

Sedimentary rocks

are usually made of grains that are stuck together and can often easily be scratched off

Crystalline rocks

are usually made of interlocking grains that are very hard to scratch off

Igneous rocks

are crystalline rocks made of different minerals scattered through them

Metamorphic rocks

are crystalline rocks with minerals in layers or bands or made of just one material

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Circus activity 2: Will my rock hold water?



Go to video hyperlink:

https://www.earthlearningidea.com/Video/Pr_Will_rock_hold_water.htm

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Circus activity 3: The soil water shake test



Go to video hyperlink:

https://www.earthlearningidea.com/Video/Pr_Soil_water_shake.htm

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Circus activity 4: Make your own soil



Go to video hyperlink:

https://www.earthlearningidea.com/Video/Pr_Make_own_soil.html

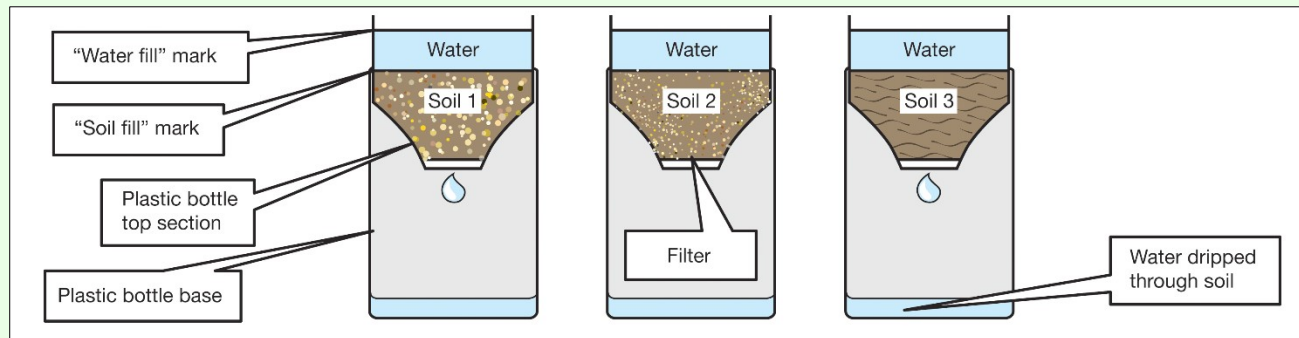
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Circus activity 5: The great soil race



Go to video hyperlink:

https://www.earthlearningidea.com/Video/Pr_Great_soil_race.html

Exploring rock, soil, water, fossil

Circus activity 6: Changing state - transforming water



Go to video hyperlink:

https://www.earthlearningidea.com/Video/Pr_Changing_state_water.html

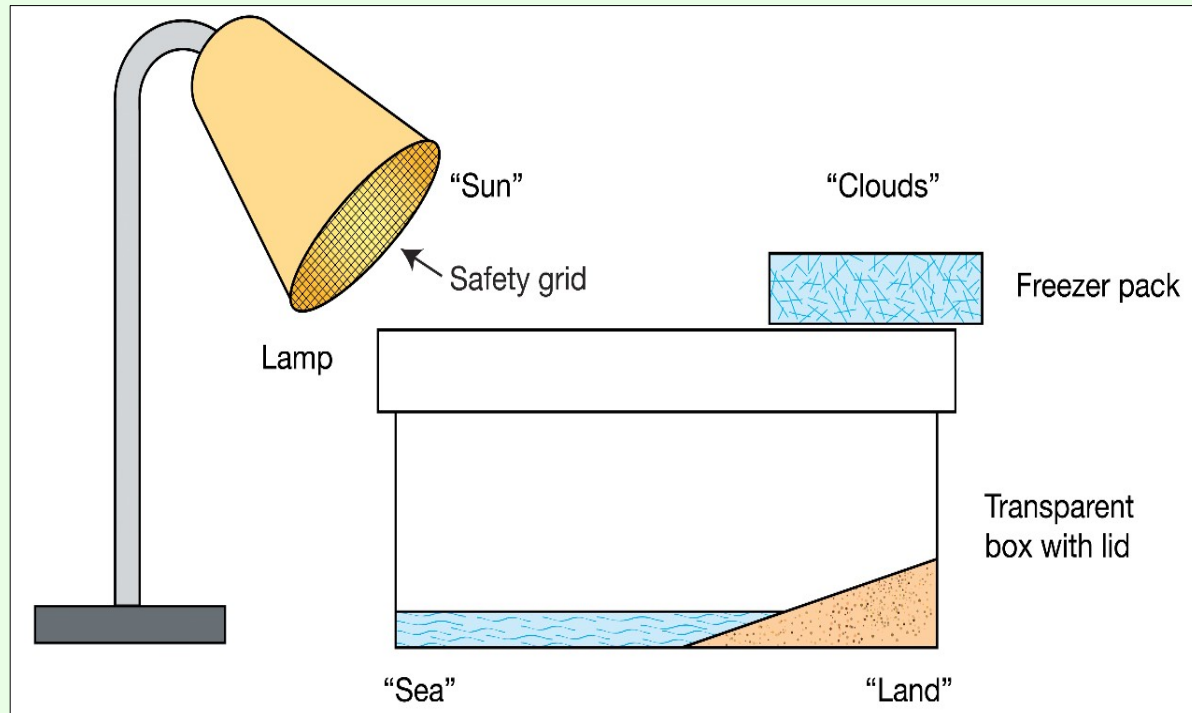
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Circus activity 7: Make your own rain



Go to video hyperlink:

https://www.earthlearningidea.com/Video/Pr_Make_own_rain.html

Exploring rock, soil, water, fossil

Circus activity 1: Fossil or not?



Fossil bone - Ichthyosaur vertebra. Photo: P.Kenneff



Some hazelnuts Photo: P.Kenneff

Go to video hyperlink:

https://www.earthlearningidea.com/Video/Pr_Fossil_or_not.html

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Exploring rock, soil, water, fossil

Circus activity 8: Fossil or not? – helpful cards

A body fossil:

A body fossil:

is the remains of the body of an animal or plant, or the imprint or cast of it

A trace fossil:

A trace fossil:

indicates that an animal or plant was there, but is not a body fossil; it includes footprints, burrows, signs of roots, tooth marks, etc.

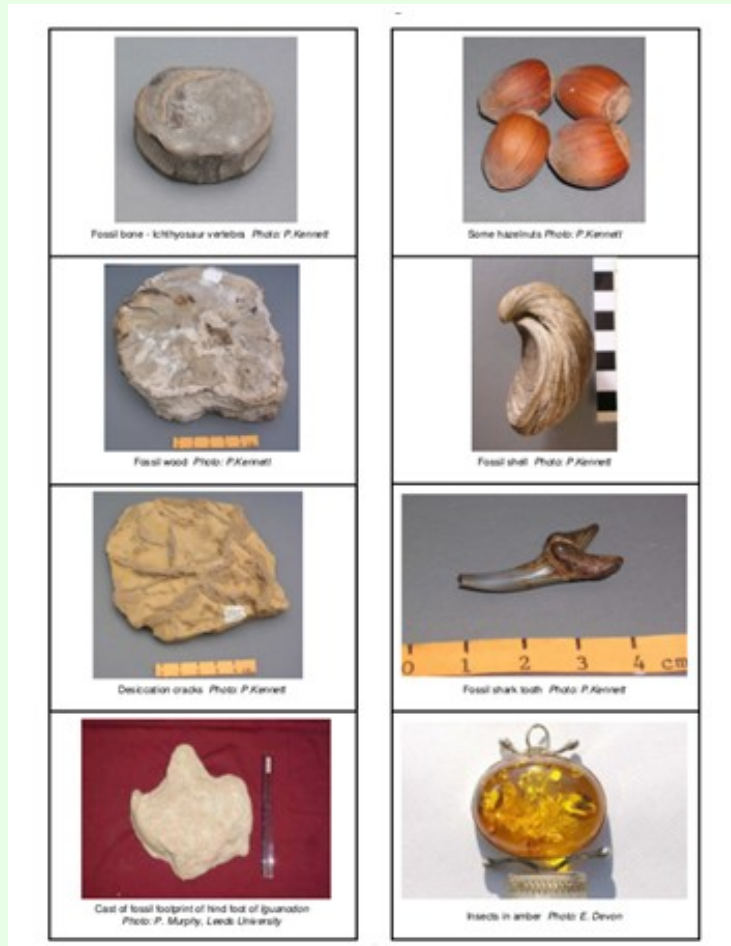
Not a fossil:

A fossil:

is any preserved sign of past life more than 10,000 years old

Exploring rock, soil, water, fossil

Circus activity 1: Fossil or not?



The pictures are of:

- fossil bone
- hazelnuts
- fossilised wood
- fossil shell
- desiccation cracks
- fossil tooth
- dinosaur footprint
- insects in amber

Exploring rock, soil, water, fossil

Circus activity 1: Fossil or not?

Which of the following are fossils?

<input type="radio"/> 4000 year-old footprints like ours as found in mud north of Liverpool, UK	not old enough to be a trace fossil
<input type="radio"/> a squirrel killed on the road	not a fossil, not old enough
<input type="radio"/> 3500 million year old cell filaments	body fossil
<input type="radio"/> a petrified tree stump	body fossil
<input type="radio"/> the trail of a trilobite in 530 million year-old rocks	trace fossil
<input type="radio"/> 'tree-like', dendritic mineral growths	not a fossil – not produced by life
<input type="radio"/> a beach pebble with holes bored by marine organisms	probably not a fossil, unless the boring took place more than 10,000 years ago, in which case the boring is a trace fossil
<input type="radio"/> a human shape preserved in volcanic ash at Pompeii	not old enough to be a fossil – Vesuvius erupted, burying Pompeii, in AD79
<input type="radio"/> a piece of dinosaur skin	body fossil

Exploring rock, soil, water, fossil

Plenary: What was it like to be there? – bringing a fossil to life



A fossil trilobite of the species *Dalmanites limulurus*, 7cm long. From Silurian age (443 – 416 million years old) mudstone strata of New York state (USA).
(Taken by DanielCD. Permission is granted to copy, distribute and/or modify this document under the terms of the [GNU Free Documentation License](#).)

Go to video hyperlink:

https://www.earthlearningidea.com/Video/Pr_What_like_be_there.html

Exploring rock, soil, water, fossil

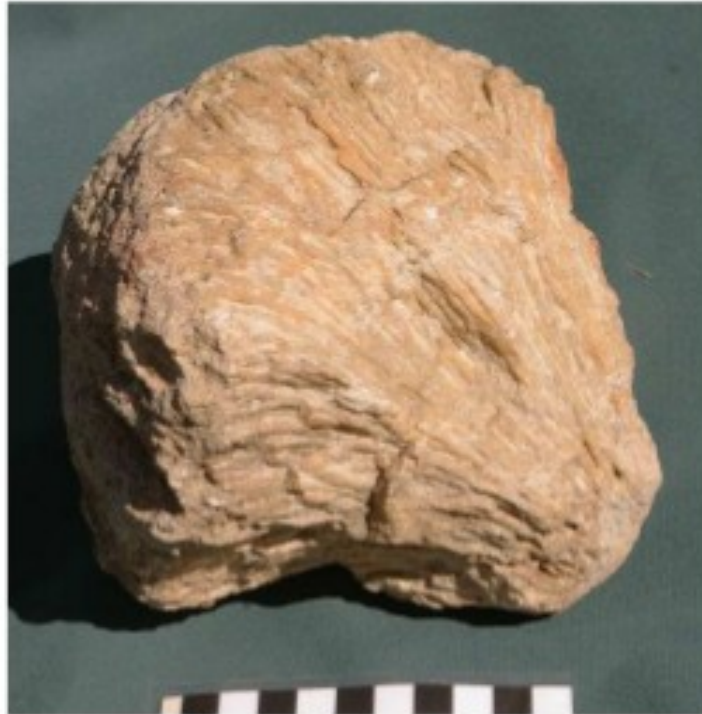
Plenary: What was it like to be there? – bringing a fossil to life



Albertosaurus skeleton in its burial position. Skeleton about 4m across.
(From the American Geological Institute, Earth science World Image Bank
<http://www.earthscienceworld.org/images/index.html>.
Photo ID: hpdzvh, copyright Abi Howe, AGI.)

Exploring rock, soil, water, fossil

Plenary: What was it like to be there? – bringing a fossil to life



Colonial fossil coral *Cladophyllia* from Jurassic (200 - 145 million year old) rocks in Wiltshire, UK, Photo: Elizabeth Devon. Specimen about 15 cm across.

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Optional activity: Save our soil



Go to video hyperlink:

https://www.earthlearningidea.com/Video/Pr_Save_our_soil.html

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Optional activity: Soil doughnuts



	Shape	Soil type	Picture
1	cone	sandy	
2	ball	sandy loam	
3	sausage	silt loam	
4	worm	loam	
5	horseshoe	clay loam	
6	tyre	light clay	
7	inner tube	heavy clay	

Soils table from an unknown source

Go to video hyperlink:

https://www.earthlearningidea.com/Video/Pr_Soil_doughnuts.html

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Optional activity: Will my gravestone last?



Go to video hyperlink:

https://www.earthlearningidea.com/Video/V14_Gravestones1.html

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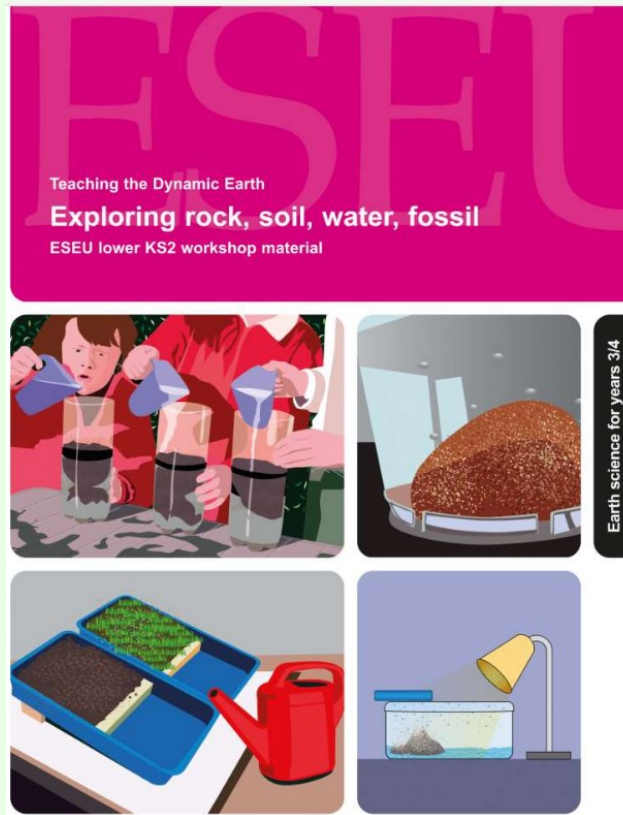
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