

Picturing Fossils -2

Visualise and draw fossils from a verbal description

Encourage pupils to look carefully at fossils and to describe them verbally so that another person can visualise them from the description.

Seat pupils in pairs, with each person holding half of the photograph cards showing fossils, printed and cut up from those shown below. They should NOT show each other what cards they have in their hands.

Pupil A then examines one photograph and describes it as fully as possible to Pupil B, who listens carefully and then tries to draw it. Pupil B must listen in silence and not ask any questions. Pupil B then takes a turn with another card, with Pupil A doing the drawing, also in silence. Pupils should then compare their hand-drawn efforts with the photographs.

Note:

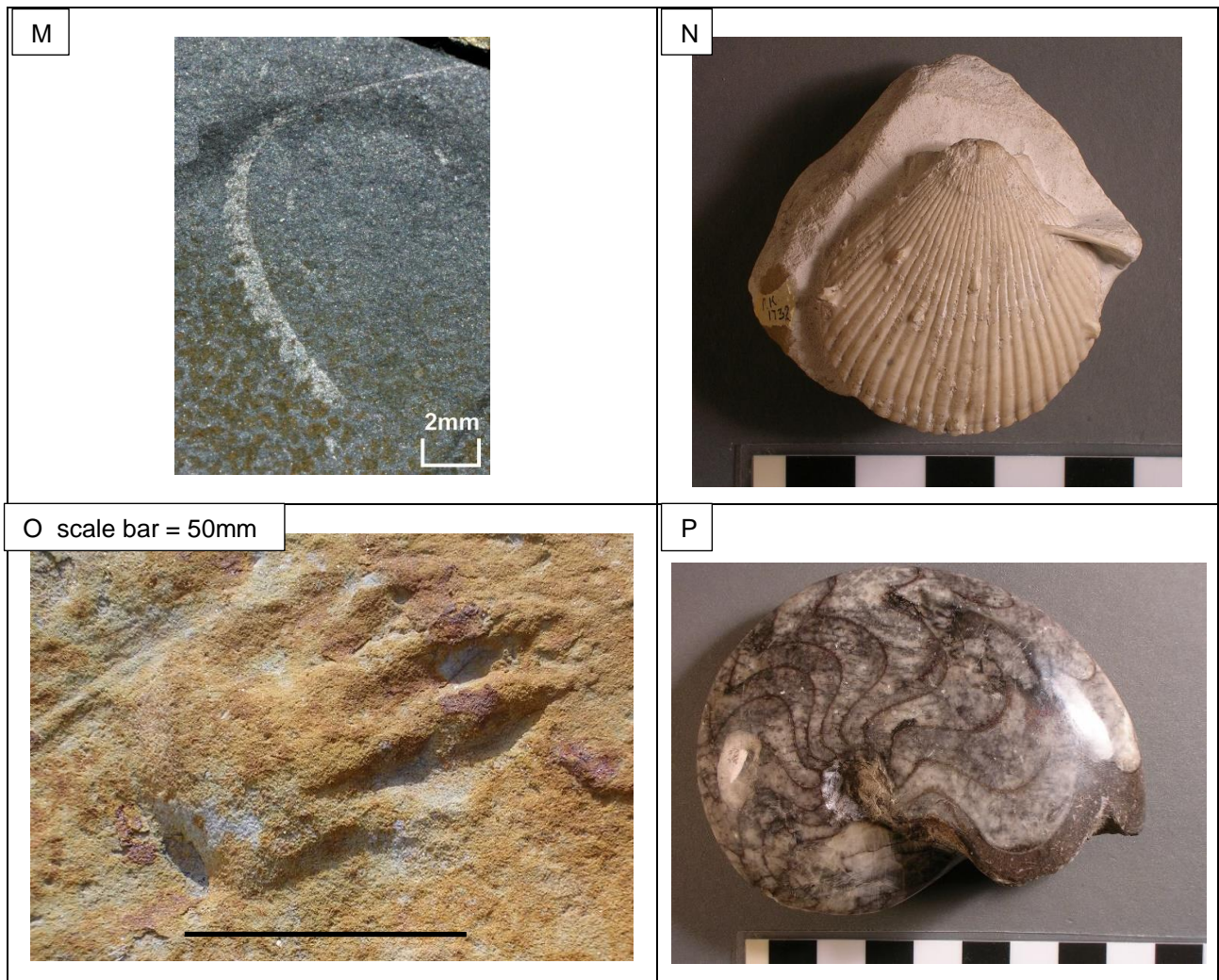
If the pupils who are speaking think that they recognise the group to which the fossil belongs, they may say so, and then use their descriptions to check their diagnosis. Recent examination specifications in the UK have reduced the number of fossil groups and technical terms which pupils are expected to recognise, compared to former times. However, pupils will probably find unknown

fossils during their fieldwork and should be able to describe them and look them up, without trying to fit them into groups with which they are familiar. For the sake of brevity, some technical terms will be used in the descriptions below.

This first round should be tried without any guidance. Then give each participant the Prompt Card, to encourage them to be more specific in further descriptions, and ask them to work through the remaining photographs, comparing their drawings with the photographs after each round. Note that some fossil groups may be repeated on different photographs.

When all have finished, give out the descriptive cards and ask pupils to match the descriptions to the photographs which they have been using. Names assigned to the fossils are shown in inverted commas if a precise identification has not proved possible.

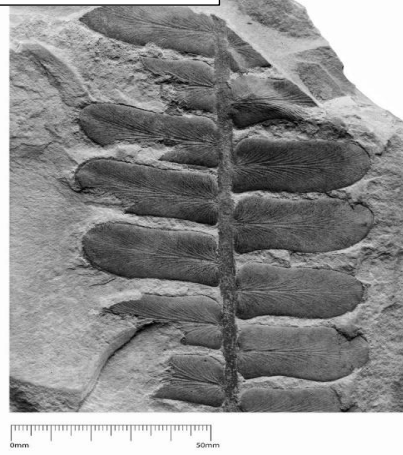
Each black or white bar on the scale in the photographs is 10mm.



Q scale bar is 10mm



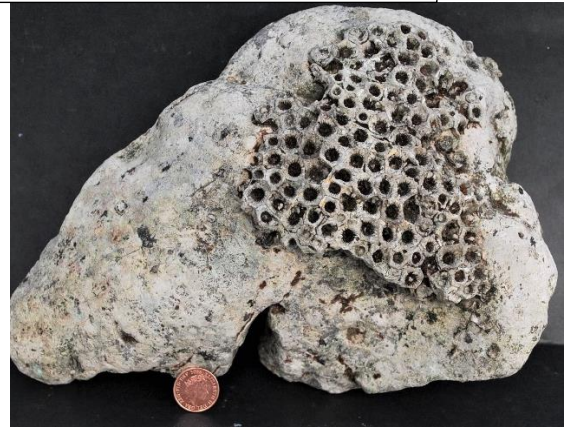
R scale bar = 50mm



S



T The coin is 20mm in diameter



U



V



W



X scale bar = 30mm



Prompt Card

Use this card as a check list to aid your verbal description of your photographs to your partner

If you think that you know the name of the group to which the fossil belongs, you may tell your partner, but be sure to check your identification as you describe the specimen.

Is it a body fossil or a trace fossil?

Is it a solitary organism or a colonial one?

What size is the specimen?

What aspect does the photo show? e.g. top view;

Does the specimen show any symmetry? e.g. bilateral, radial

Descriptions of the photographs

<p>1. Shark tooth. This owes its preservation to the coating of phosphatic enamel, and the shiny surface is original – it has not been polished or varnished. The bodies of sharks are seldom fossilised, since they consist of cartilaginous material which readily decays.</p>	<p>7. Goniatite. In this polished specimen, the outer shell has been removed, exposing the typical goniatic suture (junction between each chamber and the outer shell). This is rounded towards the (missing) body chamber and pointed towards the inner whorls. The shape is involute, i.e. later whorls cover the earlier ones.</p>
<p>2. Echinoid (<i>Hemicidaris</i>). A regular echinoid. The apical disc surrounds the open anus at the centre. The five ambulacral and interambulacral areas radiate from it, with fivefold symmetry. The interambulacral plates carry many large tubercles, to which club-like spines were attached during life. The tubercles are very much smaller on the ambulacral plates.</p>	<p>8. Coral (<i>Lithostrotion</i>). A colonial rugose coral, with tightly packed polygonal corallites. Some corallites show the central columella and septa. The whole specimen consists of just one <i>Lithostrotion</i>, mostly preserved in limestone, but in the raised part limestone has been replaced by chert, which is more resistant to weathering.</p>
<p>3. Graptolite (<i>Monograptus</i>). A graptolite with a single stipe. The sicula is at the top of the photo, so the stipe is referred to as scandent. The thecae are curved, resembling the teeth on a saw.</p>	<p>9. Brachiopod (<i>Epithyris</i>). The fossil shows bilateral symmetry through the valves and the two valves are of unequal size (inequivalve). The view shows the smooth brachial valve, with a wavy margin. The pedicle valve is indicated by the obvious foramen (hole) through which the fleshy pedicle would have emerged in life.</p>
<p>4. Trace fossil (<i>Cast of a footprint</i>). This five-toed footprint was left by an unknown vertebrate animal walking on a soft substrate. Shortly afterwards, the footprint was filled in with sand which lithified to sandstone. The block with the footprint was recently eroded out of a cliff face and fell upside down on the beach.</p>	<p>10. Bivalve (<i>Spondylus</i>). A ribbed bivalve shell in a chalk matrix. It could be confused with a brachiopod but the presence of broken “wings” indicates there is no bilateral symmetry through the valves. The spines may have prevented it from sinking in to the soft chalk substrate.</p>
<p>5. Belemnite. A slightly water-worn and incomplete “guard” from a belemnite, consisting of a solid cigar-shaped mass of calcite material (When the end view is available, the calcite crystals radiate out from the centre). Belemnites are extinct cephalopods, related to cuttlefish.</p>	<p>11. Trilobite (<i>Acernaspis</i>). The specimen may be divided into three “lobes” - one axial and two lateral. It comprises a rounded cephalon (head), with two eyes and an inflated, deeply furrowed glabella; a thorax with 9 segments; and a pygidium (tail) with 10 fused segments.</p>
<p>6. Plant (<i>Neuropteris</i>). Part of a seed fern, consisting of a straight stem and alternating leaves attached at right angles to the stem. Each leaf is bluntly rounded and shows very clear veinlets radiating from its base.</p>	<p>12. Ammonite (<i>Apoderoceras</i>). A very large incomplete ammonite (the body chamber is missing) with an evolute shell. The later ribs are strong, with the damaged remains of tubercles near the margin. The inner whorls are obscured by a clayey matrix, with fossils of serpulid worms and a bivalve.</p>

The back up

Title: Picturing fossils - 2

Subtitle: Visualise and draw fossils from a verbal description

Topic: Enhancing pupils' skills of description and interpretation using photographs of fossils

Age range of pupils: 16 years upwards

Time needed to complete activity: About 30 minutes, depending on depth of discussion

Pupil learning outcomes: Pupils can:

- examine photographs of fossils carefully and describe them intelligibly;
- listen carefully to a verbal description and interpret it in a drawing;
- enhance their observational skills as a prelude to field work.
- use the properties to identify the fossil.

Context: This could form a useful revision activity, once pupils have studied fossils. *Answers to the matching exercise are:* M3, N10, O4, P7, Q11, R6, S1, T8, U12, V9, W5, X2

Following up the activity:

- Adopt the same approach to real specimens, if you have them.
- Ensure that pupils use the same careful description and interpretation approach to geology in the field.

Underlying principles:

- This strategy provides training in careful observation and interpretation of all relevant features.
- Being obliged to give a verbal description encourages careful observation, to ensure that clues are not missed.

Thinking skill development:

Verbal dexterity and metacognition are encouraged by the need to give intelligible verbal descriptions and to interpret from them. Applying the activity to real specimens or to the field situation is a bridging activity.

Resource list:

- Card sets of Photographs, Prompt Cards and Description Cards, cut out from those shown above.
- If real specimens are available these may be used instead, with appropriate matching descriptions drawn up by the teacher (although it is harder to hide real specimens from each other).
- A ruler per pair might encourage accurate observation and description.

Useful links:

See the table below for other Earthlearningidea activities in the "Picturing" series.

Source: Written by Peter Kennett of the Earthlearningidea Team.

Photo M is P521155, Q is P521140, R is P688875 and X is P550276 [GeoScenic | Image Details – \(bgs.ac.uk\)](#)

All other photos by Peter Kennett

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Picturing.....

Earthlearningidea has compiled a series of activities involving examination of photographs of geological interest and their careful verbal description to others. This table will be updated as fresh activities are added. All titles begin with: "Picturing....."

Title	Sub-title
Puzzle structures	Visualise and draw sedimentary structures from a verbal description
Trace fossils and other strange shapes	Visualise and draw trace fossils and sedimentary structures from a verbal description
Igneous rocks – 1	Visualise and draw igneous rocks from a verbal description
Igneous rocks – 2	Visualise and draw igneous rocks from a verbal description
Metamorphic rocks	Visualise and draw metamorphic rocks from a verbal description
Tectonic structures – 1 faulting	Visualise and draw fault structures from a verbal description
Tectonic structures – 2 folding	Visualise and draw fold structures from a verbal description
Minerals -1	Visualise and draw minerals from a verbal description
Minerals -2	Visualise and draw minerals from a verbal description
Fossils -1	Visualise and draw fossils from a verbal description
Fossils -2	Visualise and draw fossils from a verbal description
Landforms 1	Visualise and draw landforms from a verbal description
Landforms 2	Visualise and draw landforms from a verbal description
Landforms 3	Visualise and draw landforms from a verbal description
Landforms 4A	Visualise and draw landforms from a verbal description
Landforms 5B	Visualise and draw landforms from a verbal description