

Issue 61

FOSSILS 1

Introduction

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INTRODUCTION

In this issue and the follow up issue 62, we will explore avenues for focusing the study of fossils within the National Curriculum. This issue will focus on basics, with 62 focussing on work for more able and older children. As a flexible teaching aid the study of fossils is a gripping subject offering wonderful opportunities for integrated project research. Its overview encourages imagination and provides an introduction to many scientific areas. In general terms “fossils” capture the public interest, as seen through docudrama and mainstream films to internet/news articles such as the B.B.C. News release of 21st November 2007 entitled “Giant sea scorpion claw unearthed”.

Placing a fossil in your pupils’ palm enables a link in which creativity can evolve as ideas flow from art activities to factual accounts, creative writing and verse! Alternatively, thinking mathematically, geological time lines are a good way to demonstrate the sequence and scale of events over a given period. There is also tessellation from fossil patterns themselves. A study of past environments and the possible reasons for the survival/extinction of past creatures clearly links into a biology theme; teaching the food chain; animals versus environments and their interaction; studying the fossil record provides evidence of changing biodiversity as well as the decrease/increase of certain species over geological time. Fossil study is extremely important for the understanding of rock formation with age estimation (zone fossils) and also a good link for studying carnivores, herbivores, reptiles and birds.

Our planet’s history is related to pupils through fossils and your enthusiasm can develop this aspect within the curriculum. As background information there are four basic methods of fossilisation:

- Most fossils are created by a creature’s hard parts, which taking longer to decompose, becoming covered with sediments over time with eventual decay and mineral replacement creating a rock version (sedimentary rock formations being the most common location for fossils).
- Petrification occurs far less frequently but includes plant material and soft animal parts in which mineral replacement creates rock versions of the originals, for example petrified (fossilised) tree trunks, which are rock but seem on face value to be wood.
- Trace fossils are the result of animal behaviour and include footprints, tracks and burrows.
- Finally there are preserving environments such as amber from plant resin, capturing insect life intact; deep ice formations containing entire frozen creatures as well as tar pits and peat bog sites offering up the remains of human and other animal remains thousands and hundreds of thousands of years later.

MAKING YOUR OWN (TEACHER) FOSSIL CASTING SETS

This will need to be done by an adult, such as a classroom assistant. However, once made the sets can be used for many years and can form a useful resource for many areas of topic work.

Materials:

Liquid latex and thickener (sold in Art & Craft /Hobby outlets, sometimes sold as a pack but ask retailer if not and discuss quantity to be purchased – as a rough guide current costing is around £10.00 per litre); potters plaster (plaster-of-Paris) – around £5:00 per 5 litre tub; protective coverings for your designated work area (remember this is a set aside area for a week!); apron or similar as latex is almost impossible to remove from clothing; some screws (sized according to your cast); cardboard for “shuttering”; a toothbrush; a drying rack and finally your chosen original fossil sample(s).

Method:

Part One

- Holding your original fossil (you will need a sample which is proud enough at the rear for you to grip having once applied the first and subsequent layers of latex, in order to lift and place on the drying rack) apply the first layer using a toothbrush, on say a Monday morning.
- Repeat late Monday afternoon and then build up the layers each morning and afternoon over 7 days. (Do not touch the rubber between coats, as it will affect adhesion). Ensure you design an even edge around your sample for ease of later casting purposes. When you are happy with the thickness and at the end of the 7 day period use the cardboard as “shuttering” around the mould and back fill with thickened latex to create a stable base.
- When your mould is completely dry, peel it off (washing up liquid is a useful lubricant if needed). Clean and dry the moulds and allow to cure at room temperature for 2 days.
- Now fill the mould(s) with your mixed plaster and allow them to begin to harden off, then introduce a screw into the plaster and turn out when set – you now have a set of casts from which you can make future moulds – enabling you to return borrowed fossil originals! (No harm is done to the original surface).
- Repeat as above for next mould making session - dependant upon usage the moulds should last 3/4 years.

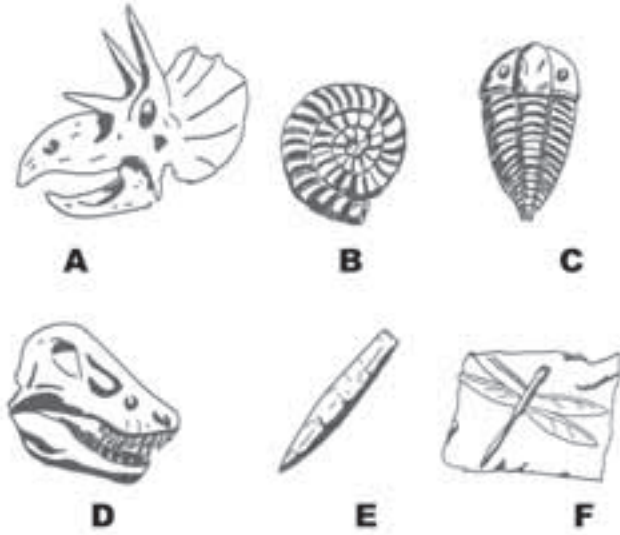
Part Two

- These are now ready for the children to use. There is Science involved related to the water reaction with the plaster as well as the end result of turning out a replica fossil. Ensure normal health and safety measures are taken. Show the children how to mix the plaster and fill the moulds.
- Allow 30 to 50 minutes to set depending on cast size, then turn out and dry for around 2 days. Once hardened dried off the replicas can be painted accordingly if required.
- This replica casting could be used at your school fund raising events. Magnets can even be added to the setting plaster and when turned out you've got a fridge magnet.

Fossils in artwork

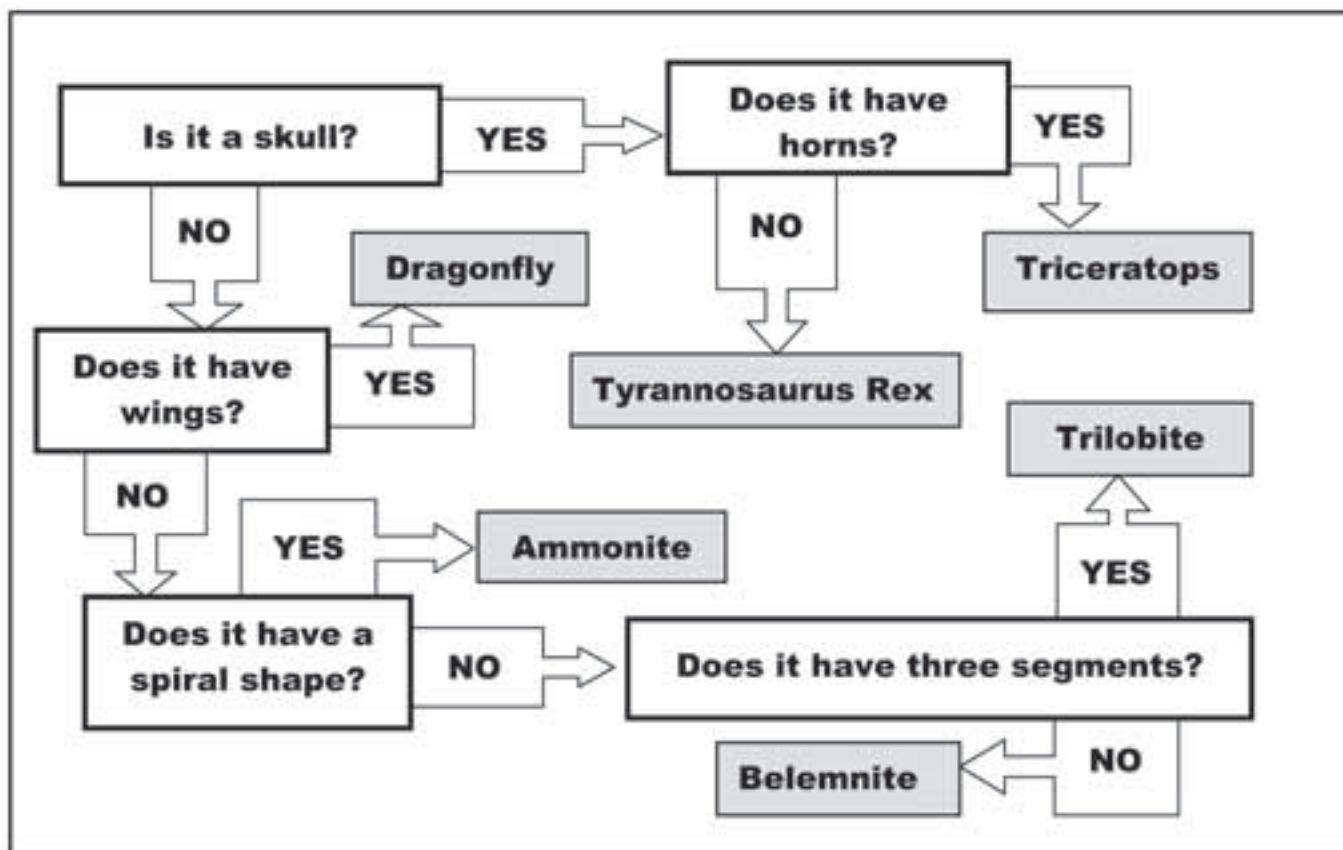
Casts, as described above, can be used in a number of ways. If you are unable to make such moulds, children can make similar ones by impressing fossils into plasticine. Plaster casts of smaller fossils can be used to decorate picture or mirror frames, boxes, desk sets and similar items by gluing them on to the surface (A glue gun is a good way of doing this).

Identification using a Branching Key



Example using some of the more recognisable fossils that children will have seen in books or museums. If you have a school fossil collection then the branching key could be done with real examples.

Pictures are not to scale.



Fossil pictures and designs

Flat fossils are ideal for making rubbings using wax crayons. Pictures in various media such as pencil, charcoal, ink or paint can be produced as observational representations of the fossil or to depict the living creature in its habitat.

Certain fossil shapes are suitable to be simplified and made into stamps for printing repeat patterns that can be used to decorate stationary. Photographic records can be kept and added to an index of any fossil collection and fossil groups can be used to create some very artistic still-life photographs. Pictorial representations inspired by fossils can be produced in a wide range of media.

Dance and Music

Dance may seem an unusual link to fossils, but a dance can be based on the imagined life of the creature or on the shape of the fossil. For example an ammonite would suggest a spiral movement.

The creation of a fossil usually begins with the death of a creature. Are there any clues as to how it died? Children could imagine the last hours and compose music to illustrate them and, of course, the music and the dance could be combined.

Fossil Timeline

Children of primary age have little concept of the very long periods of time involved in geology and the popular culture of films and cartoons has thoroughly confused the reality. Nevertheless a collection of fossils, when combined with artist's impressions of the living creatures can be used to create a sequenced order of evolution. Use the more well known creatures e.g. trilobites, ammonites, dinosaur skulls or teeth, mammoth tusks, flint tools. It is probable that your school has only a few fossils but these can be augmented with fossil casts and fossil photographs (from the internet). Use a published timeline and simplify it to ensure the examples that you use are in the right order. Add crocodiles, dragonflies or turtles to show that a few creatures have spanned long time periods.

National Curriculum Links

Some of the science areas that can be linked to this work are Sc2 - 4a, b and c - variation and classification where keys are mentioned. Also they are unusual illustrations of Changing Materials within Sc3, 2a and f, involving mixing materials and non reversible changes together with the obvious links to the rocks and soils within Sc3, 1d.

Forthcoming Events where ESTA Primary Team Members will be providing workshops, resources and useful information.

Geographical Association Conference, Guildford 27th – 29th March 2008. www.geography.org.uk
ESTA Conference, Liverpool, 13th – 14th September 2008. www.esta-uk.org
Full details are available from the respective web sites.

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