ENVIRONMENTAL ARCHAEOLOGY AND COMMUNITY ENGAGEMENT
Activities and Advice
Jacqui Mulville and Matt Law
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On December 1st, 2010 a workshop was held at Cardiff University on the subject of community engagement for postgraduates studying environmental archaeology. In the morning, speakers from the National Museum of Wales, Cardiff University, Young Archaeologists Club and Techniquest spoke about how they have taken their research outside of the academic realm. These talks outlined key learning outcomes from the experience, and offered practical advice in identifying and engaging with new audiences.

In the afternoon participants worked in groups with help from the speakers to design outreach activities based on aspects of their research and targeted at specific age groups. These form the basis of this resource.

PEACE participants were subsequently invited to run their activities at a stall called Back to the Future? in Einstein’s Garden, the science education area at the Green Man Festival, a medium-sized music festival in the Brecon Beacons under the shadow of Crug Hywel hillfort.

Activities included Who Am I Wearing?, which explored the use of animals in clothing through history using costume; Future Animals, an activity developed by Jacqui Mulville and Paul Evans with Beacons for Wales funding which looked at how humans have changed animals for particular purposes through selective breeding and invited children to design future useful animals, and the Washing Line of Time, on which visitors were asked to pin notable events in chronological order.

The following activities were designed by PEACE participants during the afternoon session. The activities are designed to cover a range of groups. Some require minimal equipment, others require archaeological material.
Hints for planning engagement activities
Matt Law

Before starting to plan your activity, think about who the participants will be, how long you want the activity or event to last, and what it is you want participants to take away from it. You might want to disseminate the results of your research, or develop a research project with a local community group, perhaps as part of a wider community archaeology project. These different aims will shape how you go about planning your project.

There are distinct age groups to think about – early years, 7-11, 12-16, young people, students, families, adults and senior citizens. It’s OK to work with the group you’re most comfortable with. Different people have different learning styles, so try to include different activities that will benefit a wide range of people. Some groups will like it if you walk around between groups to see how they’re getting on – giving them some autonomy, others will prefer it if somebody sits with them the whole time and discusses their ideas.

Engagement is a two-way process. You should think of the group you’re working with as participants or contributors, not an audience. Allow time for discussion and allow participants to formulate and express their own ideas. Think about why participants might want to engage with you. How can you make your activity useful for them?

If you are giving a talk or writing text, try to focus your message. Don’t have more than three aims or ‘take home messages’. Practise your talk or activity – preferably with someone in your target group. Start off with a hook to provoke interest. If you’re leading an activity, this could be a question to build from (‘Do you know what an archaeologist does?’). You could start with the tool you most often use (a trowel, for example), and ask the group to guess what you do and build on from there. Keep text short, and use the active voice; it’s much more interesting to read/listen to.

Environmental archaeology-based activities can be reasonably easy to organise, and compared to fieldwork, post-excavation activities have few health and safety considerations. Within the context of an archaeological dig, they are very suitable for people who cannot take part in excavation work.

Find out more about learning styles at http://www.inspiringlearningforall.gov.uk/
Activity 1: What is an archaeologist?
Jennifer Jones

Who for: organised group, any age
Duration: 1-2 hours
Equipment: demonstration material (unstratified finds, for example pottery, lithics, animal bone, shell)

Start by asking the group the following questions:

- What is an archaeologist?
- What do you think an archaeologist does?

Discuss the answers. The level of this discussion will vary depending on age. People often bring up Indiana Jones/Tomb Raider/ The Mummy/Time Team. Archaeologists are similar, although not quite as glamorous! We are interested in how people lived in the past. Finding gold isn’t our first priority although it is very nice when we do! Often it is the rubbish left behind that can tell us the most about how people used to live.

Some people mention digging dinosaurs. We don’t dig up dinosaurs... That is what ‘Palaeontologists’ do- we are interested in humans, and dinosaurs lived on the earth millions of years before humans even existed.

What an archaeologist does

Archaeologists study how people lived in the past, using the things that they left behind. We want to find out things like:

- What did they eat?
- What did people wear?
- Where did they live?
- What was the environment like in the past?

We are a bit like detectives of the past, so we use lots of evidence to try and piece together how people in the past lived.

We have excavations to find out more about the past, which means that we get to dig in the ground and hunt for the things left behind by past populations. A lot of what we study is rubbish - the items that people have thrown away. It’s a bit like looking through rubbish bins today.

The objects or artefacts that we find are only a small part of our work. By looking at pollen and seeds found in the soil we can work out what the environment was like in the past, and the different plants that were being grown and eaten.

We have some objects from archaeological sites for you to have a look at.

Archaeological Material

Pottery

Pottery is often found on archaeological sites. It was used in many different ways, for instance as cooking pots, plates to eat from, and jars to store food and drink.

Pottery can be roughly made, intended for everyday use, or it can be finely decorated, for special occasions or for special visitors.
From a small piece of pottery we can try and piece together what we think the full pot would have looked like, for instance if we have a piece of the rim we can tell how big the pot was, if we have a piece from the body we can see the shape of it, so we can learn more about how these pots were made.

Nowadays we can analyse the pots scientifically to find out what was cooked in them, and see what meals were eaten by people in the past. Recent analysis of Viking pottery from Orkney and the Outer Hebrides has shown that fish were being cooked in the pots.

Pottery can be used to tell us how old a site is, as the materials they are made of, the shapes, and decoration of the pots change rapidly through time, and so the styles are a very good indicator of how old the pot is.

**Animal bones**

We can find animal bones on archaeological sites that can tell us lots about the people living at these sites, such as what they ate, what pets they had, what the environment was like at the time.

The bones are the rubbish from peoples meals, so this is a bit like looking through the kitchen bins of people in the past, but we can learn lots of things from them, for instance what types of animals people were eaten, what cuts of meat were being used, how the animals had been butchered, whether old or young animals were being eaten.

**Cow/Sheep/Pig**

These are good sources of meat, but also provide very useful secondary resources:

*Cow:* Leather, milk

*Sheep:* Wool

*Horses:* used to pull carts/ploughs.

**Limpets**

Limpets were very popular in some parts of South Wales in the 19th and 20th Century, there are recipes existing for limpet pie, and limpet soup. If someone were to survive by just eating limpets they would need to eat 400 of them per day to make up the number of calories needed
by an average adult.

Shells and limpets can also be used to make jewellery.

**Fish and whale bones**

In islands surrounded by water people ate lots of fish and shellfish. They might also have eaten whale, and seals too if they drifted near to shore. Whale bone was often used in architecture to build houses, and the high fat content meant that it could also be used as fuel for burning.

**Birds**

Chicken is very common food. People living by the sea would also have eaten sea birds too as they were fairly easy to catch. Gannets and fulmars were good sources of oil, so could be used for cooking, as fuel for lamps, and sometimes for medicinal purposes.

**Other uses of bone**

Bones are not always waste products. Sometimes they would be carved and worked into objects, such as combs, pins, game pieces, buttons and even musical instruments such as flutes.

**Chemical Analysis of bone**

Scientific analysis of animal bones can also be used to tell you what the animals themselves were eating, for instance having studied dog bones from a couple of Viking sites in the Scottish Islands we could tell that these dogs were eating fish.

**Stone tools**

*What do you think these are?*

*What are they made out of?*

*How could they be used?*

In prehistory, people made tools using stone. By hitting flint with a harder stone you can strike off flakes that can be shaped into tools for butchery, cleaning animal hides, hunting, chopping wood etc. Sometimes they would be fixed onto a handle made of wood, bone or antler.

We can look at the residues left on the edges of the tools to learn more about how these tools were used in the past, for instance whether they were used for cutting up plants, or for butchering animals.

As with pottery, stone tool designs change through time as people learnt how to work with the stone more effectively, so they were able to determine the exact size and shape of the flake that they strike off. Sometimes we find the debris left from knapping the tools, which can help us piece together how each flake was removed.

**Possible questions encourage people to think about:**

What do you think archaeologists in 200 years time would dig up from our lives today?

What would or wouldn’t be preserved from our lives today?

Would future archaeologists know what these items were used for?

What items would you choose to represent your life today?
Activity 2: Environmental Archaeology in Practice
Don O’Meara, Sara Khorasani and Marta Perez

Who for: an organised group, older children and adults
Duration: half day or longer
Equipment required: at least 3 tokens/ sweets per participant, with predetermined amounts of different colours.
- Pens/paper
- 3 large plain boards
- Cutouts/laminated pictures of habitat types and organisms
- Sticky labels
- 3 balls of wool

Points to consider:

- It’s worth bearing a few points in mind when running environmental archaeology-based activities
- The different levels of ability within the targeted audience
- The different skills of the specialists who may be taking part
- Try to combine multiple specialisms within a single activity in order to show how multiple proxies can be combined during the course of an archaeological project

Part One: Understanding sampling and statistics

As a simple activity to illustrate the difficulty when sampling a site each member of the audience/class is asked to pick a token/sweet from a container with a predefined number of different tokens/sweets (tins of Roses or Quality street work well here). A quick calculation is then made of the sweets which have been chosen and compared to the ratios from the original tin before the exercise began (for statistical purposes this obviously works best if there are two or three times more sweets/tokens then people). Generally this will show than some sweets are over represented, some are under-represented and some are about right. This is a good illustration of the fact that when we sample an archaeological deposit we often have to accept that our sample is not an exact representation of the original population. It is only with multiple studies, over multiple sites that we can begin to appreciate the true nature of past ecology. This activity acts as an introduction to the themes explored in the broader group activities.

Part Two: Introducing the different aspects of environmental archaeology

Divide the larger group (of for example 15 people) into three smaller groups. Each group would then be guided by a particular specialist who would introduce their field of study to their group. The emphasis of the exercise is to show participants how the information from the different fields of study overlap in some respects, but are quite
different in others. The main aims are to show:

- Different things will survive in different ways
- Different disciplines must work together to create a bigger picture
- Different organisms live in different environments

For younger children (less than 11)

This could take the form of a game where the participants need to find their partners from the other group. If there are three groups (pollen, plant macrofossils and insects) then each participant could be given an organism to represent. Participants could be given stickers with the name of their organism on it. They are then asked to stand in a circle with 3 balls of wool. Each pollen type should hold a ball of wool and pass it onto the organism they think they are connected to. Members of each group would learn about the significance of each organism and how the environmental archaeologist tries to get information from the remains when they are found. Thus the person who represents oak pollen, may realise that they are connected to the person who represents the acorn shell, but not necessarily to the pinhole borer beetle which is parasitic on the oak. Likewise, the finds of the insect Heterogaster urticae from York have been interpreted as evidence for longer or warmer summers, as has the presence of dyers madder, though the two are not linked directly; they are connected to Urtica pollen, a plant which does not rely on warmer/longer summers. Similarly, an increase in Plantago pollen could be evidence of land clearance, thus could be linked to cereal cultivation and the presence of grain weevils (Sitophilus granarius). Thus, this exercise would not necessarily be a simple game of snap where clear connections would be made and distinct groups formed. Some organisms could allow connections to be made to multiple groups. Therefore the participants would need to explain and justify the groups they make. Depending on the age of the participants these connection could be altered to reflect differing levels of ability.

For older people (teenagers to adults)

The exercise above could be made more complicated for older groups by adding more connections or by trying to explain the different proxies from other fields (the pollen diagram would be relevant here as single pollen records provide a more continuous record than those from plant macrofossil or entomological studies). Episodes such as the elm decline could be linked to the beetle Scolytus scolytus, while the decline of arboreal pollen in the early Neolithic could be linked to the rise in Plantago and cereal pollen and the appearance of cereal grains in the archaeological record. The exercise above could be made more complicated for older groups by adding more connections or by trying to explain the different specialisms in more detail. A Holocene pollen diagram could be presented and the group would have to identify the probable important position of certain

<table>
<thead>
<tr>
<th>Pollen</th>
<th>Insects</th>
<th>Plant Macrofossils</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oak pollen</td>
<td>Oak pinhole borer</td>
<td>Charred acorn shell</td>
</tr>
<tr>
<td>Plantago pollen</td>
<td>Sitophilus granarius</td>
<td>Charred grains</td>
</tr>
<tr>
<td>Urtica pollen</td>
<td>Heterogaster urticae</td>
<td>Madder</td>
</tr>
</tbody>
</table>

Table 1: example of different types of environmental evidence
Part Three: Exploring a past habitat

The different strands of evidence could then be brought together on a poster using the cutouts of different habitat types. The participants could be given a list of taxa in assemblage that matches their organism type, and using their given assemblage to connect evidence to habitat and to use cut-out habitat pieces to stick to a large plain board to build up a ‘picture’ of what the environment looked like/what it was being used for.

To continue with this theme, they could also have another 1 or 2 assemblages and plain boards and build say 3 ‘snapshots’ of the environment over a period of time.

This could be done as each group moves around the specialists – each specialist having a plain board. So group A would get to do pollen for snapshot A, insects for snapshot B and plants for snapshot C. Finally groups would come together to look at finished boards and make a story about changes over time (the site could be a really interesting archaeological site with Vikings or Romans or something that captures their imagination, showing deforestation and beginnings of agriculture for example). This could lead to interesting discussions about human impact on environments etc.

Mixed woodland and managed grassland along the River Tay, Scotland
Activity 3: Could you survive on an ancient diet?
Matt Law, Rhiannon Philp and Danielle de Carle

Who for: an organised group, 8-11 years old.
Duration: 1-2 hours
Equipment: 1 tray per group of an “archaeological” sample containing food remains, bones, seeds, shell

This is a discussion activity.

Some questions to discuss:

What is an archaeologist?

What do they do?

Why would studying what people ate in the past be interesting to an archaeologist? (see also Activity 1)

What might they find when they are digging that would tell them what people were eating in the past?

What rubbish do you throw away from your food? Wrappers – but also bits of the food itself – apple pips, chicken bones.

Take a look at the tray – what can you find that might tell us what people were eating in the past?

How would people have eaten these foods?

Can you think why archaeologists find some parts of the food (the bones, the shells) and not others (like the meat)?

In the Mesolithic (between about 11 000 and 6 000 years ago) people hunted and foraged for food rather than farming, and some farm animals and crops were not yet found in Britain. Do we eat the same things today that people ate in the Mesolithic? If not what do you think might be different? What do you think a typical Mesolithic meal would contain?

(some examples – would there be pigs? sheep? bread?)

Can you think of some food we eat today that aren’t grown in Britain? (examples – bananas, rice) Would the Mesolithic people have had access to these?

Could you eat a Mesolithic diet? Would you want to?

![Limpet shells from the Outer Hebrides](image-url)
Activity 4: Who am I wearing?
Julia Best, Jennifer Jones, Gemma Ayton, Ashleigh Haruda, Alex Mulhall, and Lizzie Wright

Who for: all ages, drop in activity
Duration:
Equipment: different items of clothing made from different animals (or synthetic hides/ furs) (suggestions below). Failing that, pictures!

In the past people used animal products for a very wide range of things including making a large number of clothing items. Today we tend not to think about where our clothes, food and possessions come from because we are often so distanced from the production process. You may be wearing many more animal products than you realise.

Different period costumes show what animals were used for in the past. What animals are being used in the Medieval clothing? Can you spot the animal products in the showgirls’ glamorous outfit? And what animals are being worn by the elegant Victorian ladies and gentlemen?

Showgirl
Ostrich feathers in woollen (sheep)

Medieval Woman
Woollen dress (sheep) coloured with a plant dye.
Colour of wool was fixed by a mordent – usually urine!
Leather shoes (cow) in winter lined with sheepskin. Animal glues also used in shoe production.
Leather pouch (cow)
Leather belt (cow)
Horn buttons
Antler pins from Red Deer
Bone needle (sheep)
Rabbit fur lining in hood
Silk lining in hood (from the cocoons of the larvae of silkworms)

How would you feel if you were told this was cat fur trimming the woollen surcoat? Think about the different ways we perceive animals today to in the past. Pets vs working animals.

Additional dying and tanning information:
Animal products could also be used to dye cloth. Purple/indigo in the medieval period was an expensive dye extracted from sea snails such as Bolinus brandaris and Hexaplex trunculus. Red dyes could also made from the dried bodies of insects such as Kermes.
Urine was used to remove hairs from skins in the tanning process to create leather. Once the hair was removed, the tanners would bate the material by pounding dung into the skin. Among the kinds of dung commonly used were that of dogs or pigeons. Sometimes the dung was mixed with water in a large vat, and the prepared skins were kneaded in the dung water until they became supple, but not too soft. The ancient tanner might use his bare feet to knead the skins in the dung water, and the kneading could last two or three hours.

**Fur and Silk Information:**
As with many aspects of clothing the types of fur you were allowed to wear were dictated by the sumptuary laws (the below excerpts are from a 1363 law). Ermine fur (the winter coat of the stoat) was the preserve of the royal and the very elite and became incorporated into heraldic designs. Ermine was therefore of particular importance and these laws tried to control its use to prevent lesser women passing themselves off as 'ladies of consequence'. Rabbit, cat and lamb were allowed for women of lower status. Silk was also regulated. Of course, these laws were frequently ignored! The existence of the laws in the first place shows that people were dressing beyond what was considered their rank.

- **Knights with land worth 400 marks.** i.e. £266 13s 4d annually and their families: may dress at their will, except they may wear no weasel fur, ermine or clothing of precious stones other than the jewels in women's hair.

- **Knights with lands worth 200 marks.** i.e. £133 6s 8d annually and their families: fabric worth no more than 6 marks i.e. £4 for the whole cloth: no cloth of gold, nor a cloak, mantle or gown lined with pure miniver, sleeves of ermine or any material embroidered with precious stones; women may not wear ermine or weasel-fur, or jewels except those worn in their hair.

- **Esquires with land worth £200 per year, and merchants with goods to the value of £1000 and their families:** fabric worth no more than 5 marks. i.e. £3 6s 8d for the whole cloth; they may wear cloth of silk and silver, or anything decorated with silver; women may wear miniver but not ermine or weasel-fur, or jewels except those worn in the hair.

- **Esquires, gentlemen with £100 per year, and merchants with goods to the value of £500 and their families:** fabric worth no more than 4 1/2 marks, £3, for the whole cloth; no cloth of gold, silk, or silver, no embroidery, no precious stones or fur.

- **Yeoman and their families:** fabric worth no more than 40s, i.e. £2 for the whole cloth, no jewels, no gold, silver, embroidery, enamelware or silk; no fur except lamb, rabbit, cat or fox; women not to wear a silk veil.

Beads made of plant, animal and mineral materials
Archaeologists want to know what the environment was like in the past. By finding out what plants grew it helps them to understand how people lived. The mountains were probably a similar height and shape but were they covered by WOODS and FOREST or MOORS and GRASSLAND? Different animals eat with different plants – deer like woodland and cows like grass and humans will change the plants that grow in a place to provide food for themselves or their animals. People also cut down trees to build their houses and burn in their fires.

Plants do not survive very well – think of the way they break down in your COMPOST BIN – so archaeologists rarely find plants (unless they are burnt). So how can we find out what it was like?

We need a PLANT DETECTOR.

Do you know you have a PLANT DETECTOR in your nose? If you get HAYFEVER one of the things that makes you sneeze is POLLEN.

POLLEN is a fine dust produced by plants. When pollen goes up your nose, your nose IDENTIFIES the pollen, and if you body does not like a particular plant’s POLLEN – you sneeze. AT-TIS-CHOO!

People are most allergic to the POLLEN from plants such as grasses, cereals and trees.

Most plants produce pollen. They send it out into the air and it falls as POLLEN RAIN. Some plants produce lots of POLLEN – some produce only a small amount.

Now POLLEN has been falling on the earth every since there have been plants. In some places the POLLEN survives. It is PRESERVED in wet and cold places such as BOGS where it can survive for thousands and thousands of years. ARCHAEOLOGISTS go and look in these places for old pollen to find out which plants were around in the past.

The best way to IDENTIFY old POLLEN is by LOOKING at it (NOT SNIFFING). It is very tiny so we put the POLLEN on a SLIDE (no not that slide – but a thin glass strip) and look at it under a microscope. We need to MAGNIFY it by about 100 times to see it.

POLLEN GRAINS are different in every plant. We identify the POLLEN by its SHAPE and the PATTERN on its surface. SUNFLOWERS have SPIKY POLLEN grains and PINE tree POLLEN looks like MICKY MOUSE.

Learn about different pollen grains by making models of them with plasticine.
Activity 6: Snails and Ancient Environments
Matt Law

Who for: adults and older children
Duration: 1-2 hours
Equipment: stereomicroscopes, fine brushes, petri dishes, a sample containing snails and a reference collection, pens, paper

The example below is based on a sample containing specific taxa, however the activity can be altered to fit other assemblages.

Ancient Molluscs and Everyday Life

Molluscs – which include slugs, snails, oysters, squids and mussels - belong to the second largest phylum of animals on Earth (the largest is the arthropods) and can live in a wide range of different habitats, including the sea, ponds, rivers, beaches, forests and gardens. The shells of molluscs are often found by archaeologists during excavations, where they might be the remains of meals, have been used to create jewellery and other objects, or simply have been living on the site. Although some molluscs such as oysters or banded snails have English names, many don't, so we use their Linnean (Latin) names to describe them. This also allows workers around the world to be sure we're talking about the same species.

Mollusc Habitats

Some molluscs only live in places where particular conditions exist, for example snails that live in shaded places or in short grassland. When archaeologists find these snails, it is usually in assemblages of different species which can be used to reconstruct environmental conditions in the past. Recording how the different species present at a site have changed through time is one of the ways archaeologists can see how people changed their local environment – for example by removing trees or allowing ditches to silt up. Where a large number of different species are found in the same deposit, it often means the ground surface was stable for a long time, allowing more species of snail to move in. This might happen in the years after a settlement is abandoned.

Aliens and Extinctions

Since the Ice Ages, the species of mollusc which live in Britain have changed. Some snails which used to be common when the country was colder now live only in mountainous areas or not at all in Britain. Other species have been introduced, some by accident others –such as the edible Roman snail – deliberately. Many of the introduced species are now very common.
Finding Snails at Archaeological Sites

Although some snail shells are very easy to see, most are only a few millimetres in diameter and cannot be seen in the ground. To find them bulk samples of the soil or sediment need to be taken, often in a vertical series which will show changes through time. The sample is washed through a series of sieves, usually from 2 mm mesh size down to 0.25 mm, and the shells in each sieve carefully examined and counted under a microscope.

Edible Molluscs

Some molluscs, such as oysters, mussels, cockles and limpets, are edible, and their shells are often found at archaeological sites. In particular, oysters were very commonly eaten by people in Britain from the Roman period until the oyster stock in British seas declined towards the end of the nineteenth century. When oysters have been harvested from the wild, their shells are often colonised by other tiny marine organisms. Identifying these organisms can sometimes tell archaeologists where in Britain the oyster was harvested.
Studying ancient snails

In the dish under the microscope is a sample from an archaeological site

Try to identify and interpret the snails present based on the information given here.

There are 5 steps to identification. These are very similar to the processes used in the identification of almost all other animal and plant remains from archaeological sites.

1) Sort the shells from the sample and put them into a dish. You can pick out the shells with a wet brush.

2) Sort the shells so that similar ones are together. The features to look for are shape and surface patterning. Size is not very helpful as juvenile snails are smaller versions of adults.

3) Compare the shells to the identification notes on this sheet. Which seem most likely?

4) Compare your shells to those in the reference collection. Please be careful to return shells from the reference collection to the correct tube.

5) Make a note of the shells you have identified, how many there are, and what habitat the snail lives in. Take a look at the description of different types of habitat. Where do you think the sample is most likely to come from?
Some possible habitats
Hedgerow – shaded, but often surrounded by open fields.
Field – usually open, sometimes seasonally flooded
Ditch – longer vegetation creates shade, often flooded, may be surrounded by open fields
Woodland – shade

Identification and ecological notes for a possible assemblage
Cecilioides acicula (Müller, 1774) – Terrestrial, subterranean
Cochlicopa lubrica (Müller, 1774) – Terrestrial, common in a variety of habitats
Carychium minimum Müller, 1774 – Terrestrial, shaded, damp environments
Vallonia cf. excinctrica Sterki, 1892 – Terrestrial, grassland
Trochulus hispidus (Linnaeus, 1758) – Terrestrial, common in a variety of habitats
Galba truncatula (Müller, 1774) – Wet ground, tolerant of seasonal drying out
Anisus leucostoma (Millet, 1813) – Freshwater, tolerant of seasonal drying out
Planorbis planorbis (Linnaeus, 1758) – Freshwater, tolerant of seasonal drying out
Radix balthica (Linnaeus, 1758) – Freshwater and wet ground
Ötzi, Utzi or The Iceman are names given to the 5,300-5,200 year old man discovered in the Ötztal Alps between Italy and Austria. Many items of clothing and equipment were discovered associated with him, which provide a valuable insight into the resources he was using. The items are made from many materials including plant products, stone, copper and animal products. The following information is largely based on the South Tyrol Museum of Archaeology webpage (http://www.iceman.it) which also has pictures of the iceman.

What and who was he wearing?

Coat: Ötzi had a coat made of the tanned hides of domestic goats, which would have had a pattern of alternating dark and light stripes of fur. Signs of scraping on the inside are still visible from when the hide was cleaned. After cleaning, the hides would have been tanned with smoke and fat, and then stitched together using animal sinews.

Loin cloth: The iceman’s loincloth was a rectangular piece of 33 cm-wide leather. This was also made of goat and stitched with animal sinews. It would have been worn pulled between the legs and fastened at the waist with a belt, and would originally have been around one metre in length.

Hat: The iceman also had a bearskin hat. This would have been worn fur side out, and had leather chinstraps.

Leggings: He was wearing two separate leggings which were made of both goatskin and deerskin. These would have covered the thigh and calf and were laced to the shoes with deerskin laces. They are made of several sections of domestic goat hide cross-stitched together with animal sinew. The bow-shaped top had a leather strip threaded through it, and two laces were sewn on to each legging so that they could be tied to his belt.

Shoes: Ötzi’s shoes and his leggings are the oldest of their kind in the world. The shoes have both an inner and outer part. The inner part is made of grass netting which would have held insulating hay in place, while the outer part is made of deerskin, worn with the fur on the outside. The sole is made of bearskin worn with the fur on the inside, and was fastened to the inner and outer parts with leather straps.

Belt and pouch: The Iceman wore a belt made of calf’s leather, with a small leather pouch which held a flint scraper, a flint drill, a flint flake and a bone awl. Originally, the belt was almost two metres long and would be worn wound twice around the hips and knotted.

Three large sections of woven grass were found and are thought to be either a grass
cape or mat.

**Animal products in the Iceman’s equipment:**
Leather was used to help hold the copper axe head to the shaft. The handle of the dagger was also bound with animal sinew. The iceman had a quiver and arrows. The quiver was a rectangular, elongated hide bag made of chamois skin. It is stitched together along its length and the lower narrow end and is supported by a long hazel wood rod. This supporting strut had already been broken in three during Ötzi’s lifetime. The lid and carrying strap were missing. The side pocket was elaborately decorated with leather strips. Some of the arrows had fletchings. The quiver held arrows and rough arrow shafts, as well as:
- Four antler tips tied together with strips of plant fibre
- A bent antler tip – a very useful tool
- Two animal sinews.
- A ball of rough string made from tree fibre which was about 2m long

The iceman had a net made of tree-bast string which was probably used for catching birds and rabbits, he also had birch bark containers, a re-toucher for working flint and yew bow. Several pieces of hazel wood are thought to be part of a backpack. The hazel rod served as the frame with two larch wood boards as connecting pieces. Numerous pieces of hide and clumps of hair imply that a hide sack was attached to the frame to carry the Iceman’s possessions.

He also had a disc made of white Dolomite marble which has a hole in the middle through which a hide strip was threaded. Nine twisted hide thongs were tied on to this strip. Rather than simply jewellery, the thongs may have been repair material. The stone disc would make the task of untangling them easier in damp conditions.

The iceman also carried some possible medicinal materials. His implements included two hide strips, on to each of which a round lump of the fruiting body of the birch polypore fungus had been threaded. The strips were attached to Ötzi’s clothing. Bracket fungi have been used for medicine until quite recent times.
Evaluating outreach activities

Matt Law

You may want to carry out an evaluation of your activity to find out how effective it has been. Evaluation may be **summative** – that is, designed to summarise the activity carried out, perhaps to report back to funders; or **formative** – designed to improve future activities based on past experience. Carrying out an evaluation provides evidence of how successful your activity was, and provides a learning resource that can be shared with others. Thinking about evaluation while planning your activity will help you be clear about what you want to achieve and how you will know it has succeeded.

You might want the evaluation to give you **quantitative** information about the numbers or types of people involved in your activity, or for how long people participated in the activity. You might also want some **qualitative** information, for example whether participants enjoyed the activity, whether they felt they learned something new, or whether their attitudes changed as a result of the activity. If you are trying to record change in behaviour, knowledge or attitudes, it might be useful to establish a baseline before running the activity.

There are a number of ways to collect data for an evaluation. A common way is to use a questionnaire, but if you wish to be less intrusive you could ask people to give comments on sticky notes or hold a short debate about the activity at the end with a vote. You could invite a sample of the participants to take part in a focus group, perhaps by offering an incentive. If you are interested in how many people visited a stall, you could try handing out stickers to visitors and then counting how many have gone.

It is important to be aware of the ethics of collecting data about participants. If you don’t need to know the information, it’s best not to ask about the so-called protected characteristics. These are age, disability, gender reassignment, marriage and civil partnership, pregnancy and maternity, race, religion and belief, sex, and sexual orientation. If you are interested in demographic data about your participants, you may want some of this information. In this case, questionnaires must be anonymous.

The key stages of an evaluation are:

**Aims** – Be clear what you want the activity to achieve.

**Objectives** – The means by which you hope to achieve your aims

**Evaluation questions** – The questions you want the evaluation to answer

**Methodology** – how you will carry out the evaluation

**Data collection**

**Data analysis** – you may want to number your responses and use a spreadsheet as well as some descriptive statistics. Qualitative answers may be given numerical coding to help with data analysis.

**Reporting** – make judgements about what was successful and what wasn’t, and how you might do things differently next time.

The National Co-ordinating Centre for Public Engagement (NCCPE) has compiled a list of links that may be helpful for designing and carrying out evaluations:

http://www.publicengagement.ac.uk/how/guides/introduction-evaluation