1588

Landscape of Neolithic Axes Project: School Resources

Cadw

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

Landscape of Neolithic Axes Project: School Resources

Project No. G2495

Report No. 1588

Event PRN 46059

Prepared for: Cadw

March 2021

Written by: Jane Kenney and Suryiah Evans

Cover photograph: Replica Neolithic stone axe made by James Dilley of AncientCrafts

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Contents

LANDSCAPE OF NEOLITHIC AXES PROJECT: SCHOOL RESOURCES

GAT Project No. G2495
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Summary/ Crynodeb

Gwynedd Archaeological Trust was grant aided by Cadw to create school resources about the Neolithic period and stone axe-making at Penmaenmawr and Llanfairfechan. This was done in association with Penmaenmawr Museum and the Carneddau Landscape Partnership. The report presents the content created for this resource and for other resources for use with the Landscape of Neolithic Axes Project.

Derbyniodd Ymddiriedolaeth Archaeolegol Gwynedd gymorth grant gan Cadw i greu adnoddau dysgu yn ymwneud â'r cyfnod Neolithig a chynhyrchu bwyeill carreg ym Mhenmaenmawr a Llanfairfechan. Gwnaethpwyd hyn ar y cyd gydag Amgueddfa Penmaenmawr a Phartneriaeth Tirwedd y Carneddau. Mae'r adroddiad yn cyflwyno'r cynnwys a grëwyd ar gyfer yr adnodd hwn ac ar gyfer adnoddau eraill i'w defnyddio gyda'r Prosiect Tirwedd Bwyeill Neolithig.

1. INTRODUCTION

1.1. Project Background

The Landscape of Neolithic Axes Project is a multi-year project being run as part of the Carneddau Landscape Partnership Scheme. The project is run by archaeologists from Gwynedd Archaeological Trust (GAT), grant aided by Cadw, and Snowdonia National Park Authority (SNPA), in collaboration with Penmaenmawr Museum and Historical Society, with the Carneddau Landscape Partnership supporting volunteer participation and contributing to outreach activities. The aim of the project is to investigate activity on the uplands above Llanfairfechan and Penmaenmawr relating to the production of stone axeheads, which were distributed across England and Wales throughout the Neolithic period. The project was to provide numerous opportunities for volunteer participation and community engagement. The plan for 2020-21 was to carry out a campaign of test-pitting (digging small square-metre pits) and a small excavation at the location of a recently identified axe-working site to identify the extent and nature of the activity. The fieldwork would have been carried out by volunteers under the supervision of archaeologists. Other activities would have involved the wider community and disseminated the results of the fieldwork.

However, this intended plan was thrown into confusion when the COVID-19 pandemic hit Britain and nationwide lockdown was imposed on 23rd March 2020. By summer in Wales up to 30 people could at last meet up outdoors and travel freely, so it seemed possible that the fieldwork with volunteers could go ahead. Proposals were put to Cadw in September to increase the staffing on the project so that volunteer work and COVID-safety could be closely monitored and work was planned to start in mid-October. Work with the Carneddau Partnership had led to the production of advertising material to attract volunteers and information sheets, and detailed planning had been done to carry out the work safely. Liaison with the landowner had identified shelter that could be used safely. There were plans for site visits at weekends and children's activities. However, just as the call for volunteers was going to go out Welsh Government announced local lockdowns and Conwy County was lockdown from 1st October. While it might have been possible for work to have gone ahead with just volunteers from Conwy, it was decided that a high profile project bringing people into Llanfairfechan from elsewhere was not appropriate under the circumstances, especially as Welsh Government was discouraging outdoor volunteer activities in locked down areas. The fieldwork was then cancelled. It was hoped that work might be possible in March, but the cases of the virus continued to rise, despite a short Welsh national lockdown, and on 20th December a strict, long term national lockdown was imposed that ran, with a slight easing, until the end of March 2021.

With volunteer participation not possible it was decided, in consultation with Cadw, to concentrate on producing resources that would be useful later in the project and could contribute to work being done by Penmaenmawr Museum. Suryiah Evans of Penmaenmawr Museum was working on resources for local schools covering various periods of history and prehistory. The aim was for GAT to provide expertise, images, information and ideas to enhance the accuracy and utility of a Neolithic resource with a focus on the stone axe production. Suryiah would

use this to create an innovative resource specifically suited to the new curriculum, using a "Mantle of the Expert" approach. Materials produced as part of this process, or in parallel with it, will also be used for children and adults to learn more about the landscape of Neolithic axes and will feed into outreach work done in subsequent years on the project.

1.2. Contents of the report

This report presents the material produced, which will be used in the final school resources after professional design and illustration work has been commissioned. It also includes other elements to be developed into resources for training and children's activities in later phases of the Landscape of Neolithic Axes Project. The material for children will be edited to make suitable for the age group and all the material will be translated into Welsh when the resources are produced.

This report presents the Penmaenmawr school resources first, with a table laying out the structure of the resource and guidance for teachers, then resource materials. Resource materials are numbered and cross referenced to the table to indicate which are to be used. These resources are aimed at 8 to 11 year olds and are initially intended for use in Ysgol Capel Ulo and Ysgol Pencae, Penmaenmawr, but will also be offered to the primary school in Llanfairfechan.

There then follows a training exercise to be used by older children or for a basic level accredited course for volunteers. There is also an information sheet for adult volunteers to provide background information on the archaeology that the project is studying. This information can also be used on the Carneddau Landscape Partnership Scheme website when that is up and running in autumn 2021.

Care has been taken when sourcing images to be used in these resources to use only those that were made available for non-commercial use or to obtain permission for use from the image copyright holder. Credits for the images are included in the image captions. There no specific credit is given the copyright of the image is Gwynedd Archaeological Trust.

A video showing how to make and decorate a Neolithic style coil pot has been made by Dan Amor as part of these resources.

1.3. Acknowledgements

The project has been grant aided by Cadw and has been undertaken in partnership with the Carneddau Landscape Partnership Scheme and Penmaenmawr Museum. Suryiah Evans has designed the Mantle of the Expert format of the resources and activities within that format; Jane Kenney has provided archaeological content, materials and ideas. These resources have been developed with the help of a small team comprising John G Roberts (Snowdonia National Park Authority), Rebecca Roberts (Carneddau Landscape Partnership Scheme), and Nina Steele (GAT). Nina's children are thanked for testing ideas and material. Permission to use images specifically for this project has kindly been given by James Dilley, Nick Card, and Antonia Thomas.

1.4. Copyright

2. Penmaenmawr Museum Neolithic School Resource

This resource is for children aged 8 to 11 years old. The resource is to be designed following the "Mantle of the Expert" approach, in which the children take on a project and use the resources provided to research, produce and present their results. The children take the lead in activities guided by the teacher. In this style of learning it is usual for the children to take on roles within a story and decide how they would act and what the outcome would be. In this case the story to be acted out is essentially a reality. After initially learning about archaeology and archaeologists the children are invited to become volunteers on the Landscape of Neolithic Axes Project and are asked to create an exhibition about Neolithic life in general and the making of stone axes in particular. They are also asked to help record finds from the project. The children must decide to undertake the work and how they will proceed.

2.1. Resource structure table

No.	ACTIVITY TITLE	TEACHER & PUPIL INTERACTION	PUPIL ACTIVITY	PUPIL RESOURCES	TEACHER RESOURCES
1	**Mystery box**	We have been given a box of mystery items. It's our job to look at the items and try to figure out what job the person does who would use them. Let's have a look at what's inside.	Handling Activity Put the tools in the middle of the floor and let children handle them and discuss what they are, what they could be used for and guess what job the person does.	Box of items including: **Trowel, hand shovel, brush, tape measure**, **gloves, pencil, context sheet, finds tray, a contents list** with photos of everything including a camera. A grid with a range of jobs and the list of tools. The children mark which jobs they think the tools will be used for and this should lead them to conclude that the tools are used by archaeologists.	**Resource 1**: Archaeological tools with explanations of what the tools are used for.
2	**What does an archaeologist do?**	We've discovered that these are tools used by archaeologists. What does an archaeologist do and why? Let's find out.	Worksheet Draw an archaeologist and write a job description Choose 3 archaeology tools and make a poster to explain what they are used for		**Resource 2**: What is archaeology? **Resource 3**: PowerPoint showing how archaeology is done.
3	**Big words**	Each pupil is asked to research one archaeology word. Words are on a PowerPoint	The words are on cards and each child picks on out of a bag. They then research the meaning of the word using a PowerPoint glossary and the internet. Pupils make their own archaeological dictionary	Word cards PowerPoint glossary	**Resource 4**: Archaeological word list
4	**How to record a find**	Swap one item from your bag with a friend. Record the item.	Pupils measure and record the item on the Find Recording Sheet	Find Recording Sheet	**Resource 5**: Find Recording Sheet and how to record finds
5	**A load of rubbish**	Today we are going to pretend we are archaeologists. We have done some research and we have found out that there is a bin in one of the other classrooms that may have some interesting things in it that can tell us about what the other class did yesterday. Remember the steps we talked about yesterday – research, survey, excavate, record, process and report. Our next job is to find the bin and survey it. We are going to need a camera and you are all going to need your notebooks to record where we've been. Let's go. You locate the bin. Record the bin. Archaeologists need to know where things were found, so we will record the bin using photographs. From the evidence, discuss as a group what life was like in that other classroom yesterday. Children prepare questions to ask the teacher in the other classroom, so they can change their conclusions if they wish, when they find out more evidence.	Physical activity Draw a map of your route to finding the bin. Photograph the bin in its location. Describe the bin and its surroundings in your notebook. Mark the location of the bin on your map. Children excavate the bin and record each layer with photographs. They record the finds on the Find Recording Sheets They piece together life in that classroom yesterday.	Recording the bin: Take a photograph before taking anything out of the bin. Take out and record all the objects that you can remove without disturbing any other objects. Then take another photograph. Keep doing this until the bin is empty. You will end up with a series of photographs showing where things were in the bin and how deep down they were.	Pre-arrange a bin filled with items to be discovered in a classroom. There should be enough items for each child in the class to record something different. The bin can include: Sweet wrapper Piece of paper with a date on it. Various worksheets that children discarded. Broken items Empty items Birthday wrapping paper Use **Resource 5** to help record the objects in the bin.

No.	ACTIVITY TITLE	TEACHER & PUPIL INTERACTION	PUPIL ACTIVITY	PUPIL RESOURCES	TEACHER RESOURCES
6	**The commission**	We've had a very interesting letter and I want to read it to you to see what you think we should do. *Dear Class 6,* *Did you know that the hills above Penmaenmawr and Llanfairfechan contained important archaeology? In the Neolithic period people across Britain used axeheads made of stone from these hills. We are a team of archaeologists who are investigating where the stone came from and how the axeheads were made.* *We are working with local volunteers to do several small excavations. We have found lots of remains from making stone axeheads.* *We need more volunteers to help us. There are some finds that need to be cleaned and recorded. It is also important that we let local people know about the archaeology in their area so we need to have an exhibition to show how people lived here thousands of years ago and how they made the stone axe-heads.* *We need some creative and enthusiastic volunteers to produce the exhibition for us.* *We have heard that you have been learning all about archaeology and think you would be very good at making an interesting exhibition.* *Please let us know if you would be willing to help us with this important project. We've included a list of information that we'll need you to find out in order to produce the exhibition and record the finds.* *Thank you* *Dr Jane Kenney* *Gwynedd Archaeological Trust* *jane.kenney@heneb.co.uk* What will be the good things about us working as a team to help out with this project? What will be the difficult things about us working as a team to help out with this project? If we say that we'll help them, what's one of the first things we should do? In the letter, they talk about a period of history called the Neolithic. Perhaps we should find out more about that. In the meantime, are we agreed that we will work on the project together? We need to let them know. How do we do that?	Children write or email to GAT to accept the commission		The exhibition can be about all aspects of Neolithic life but particularly looking at the Neolithic stone axehead making in the Penmaenmawr area. The exhibition can include:- What was the Neolithic period and when was it? What was the environment like in Neolithic Wales? How did people live in the Neolithic; what did they eat, what kind of shelter did they live in? How did they bury their dead? What tools did they use? Did they have art? Stone Axes:- What were stone axes? How do we know where they came from? What can you see on the ground? Where did stone axes go from this source area?

No.	ACTIVITY TITLE	TEACHER & PUPIL INTERACTION	PUPIL ACTIVITY	PUPIL RESOURCES	TEACHER RESOURCES
7	**When was the Neolithic?**	If we look at the list of what we need to include in our report, the first thing we need to do is understand when the Neolithic period was so that we can put it in our report and the exhibition. It's quite difficult to imagine all of these different time periods and people because it's so long ago. If it's hard for us, do you think it's going to be confusing for people visiting an exhibition? What could we do to understand when the Neolithic was and that we could also use in the exhibition? (The teacher may need to suggest producing a timeline here). Prompt questions for discussion: Who thinks it was after the Romans? Before the Romans? Who thinks it was after the Victorians? Before the Victorians?	Research Activity Pupils look up dates of Neolithic period, make a note, and bring that back to the group discussion. Craft activity Produce a bunting timeline to hang in the classroom and to use in the exhibition – one pupil one time period Each bunting has: Illustration of items or a person that depicts that time period Dates Whole class activity: work together to put the bunting pieces in the correct order		**Resource 6**: The Neolithic Period Horrible Histories Age of Stone Age song: https://www.youtube.com/watch?v=a0GBVxUBvlw Horrible Histories Timeline song https://www.youtube.com/watch?v=E-Le-meejdjA
8	**Ask an Archaeologist**	Q&A session with one of the project's archaeologists with the children via video link?	Children develop questions to ask the archaeologist – what do they want to know?		
9	**Life in the Neolithic**	What did it look like where we live in the Neolithic period? There is so much we need to find out about the Neolithic period for our report and exhibition, it may be better if we split into teams.	Research activity: Find out about the Neolithic environment		**Resource 6**: The Neolithic Period (forested landscape) https://forestryandland.gov.scot/images/learn/archaeologyandheritage/The-First-Foresters.pdf (specifically about Scotland but gives a good general impression)
		Team (name) – what kind of shelter did they live in?	Research activity: Find out what type of shelters people lived in Craft activity: Make a shelter either using materials you have collected or using the Neolithic paper craft house (**Resource 7**).	**Resource 7**: Make your own Neolithic house - paper craft house model (cut out and fold Neolithic house developed for this resource)	**Resource 6**: The Neolithic Period (houses) https://theprehistoricsocietyschool.files.wordpress.com/2020/03/ps-intros-neo-6-houses-early.pdf https://theprehistoricsocietyschool.files.wordpress.com/2020/03/ps-intros-neo-10-houses-late-1.pdf
		Team (name) – what did they eat?	Research activity: Find out what Neolithic people ate Research activity: How did people store their food? Literacy activity: Create a menu of Neolithic food and invite everyone to dinner at your Neolithic restaurant. Tell your guests what is on the menu.	**Resource 8**: Video of making a replica Neolithic pot **Resource 9**: Neolithic food	**Resource 6**: The Neolithic Period (farming)
		Team (name) – how did they keep warm?	Research activity	**Resource 10**: Clothes and keeping warm	**Resource 6**: The Neolithic Period (houses)

No.	ACTIVITY TITLE	TEACHER & PUPIL INTERACTION	PUPIL ACTIVITY	PUPIL RESOURCES	TEACHER RESOURCES
		Team (name) – what tools did they use?	Research activity: Finding out about Neolithic tools Craft activity: Make 'top trumps' cards for each tool and their use Craft activity: Make tools out of clay	**Resource 11**: Neolithic Tools	**Resource 6**: The Neolithic Period (tools)
		Team (name) – how did they bury their dead?	Research activity: Different ways they buried their dead Craft activity: Make a burial monument from stones, papier mache, clay, or FIMO.	**Resource 12**: Instructions for making a chambered tomb	**Resource 6**: The Neolithic Period (tombs and other monuments)
		Team (name) – did they have art?	Research activity: Researching Neolithic Art Craft activity: Paint a stone or make Neolithic patterns in clay Craft activity: paint a poster that can be collated into a collage	**Resource 8**: Video of making a replica Neolithic pot, see making decorations	**Resource 6**: The Neolithic Period (art)
10	**Story time**	Storytime – teacher reads My Neolithic Diary by Charlotte Guillain (2019, Rising Stars UK Ltd, ISBN 9781510453685)	Literacy activity: Write a diary entry and draw pictures of a week in your Neolithic life, taking into account everything you've learned through the team's research		
11	**Neolithic Stone Axe making**	The archaeologist said that there was important archaeology right here at Penmaenmawr. Can we find out what that is?	Research Neolithic stone axes from Penmaenmawr. Produce an attractive, easy to understand map of where stone axeheads have been found and where the rock came from. Mark footpaths on the map to show where you can walk to experience this landscape now. Go for a walk and imagine what the landscape was like in the Neolithic period. Make replica axeheads and complete axes for the exhibition.	**Resource 13**: Stone Axes from Penmaenmawr and Llanfairfechan **Resource 14**: Map of stone sources and axehead roughouts found in the area. Video: Making a Neolithic axe	
12	**News from the project**	We've received a video report from the archaeologists about their latest fieldwork. Let's have a look at what they have to tell us.	Research activity: Children watch a video 'live' from the site. This will show what has been found and explain why we chose to dig here. Children could visit the excavations or future ones in Penmaenmawr.	**Resource 15**: Searching for the Neolithic axe-makers (video) (This is to be made during the volunteer excavations at Llanfairfechan in September 2021)	
13	**Finds recording**	The archaeologists have sent us a box of finds that need to be recorded so they know exactly what they have got. We have had some practice at doing finds recording so do we think we can do this? The box includes: Flakes (from historic set production, similar to axe-making flakes and widely available on spoil heaps) Rough out(s) (on loan from Penmaenmawr Museum) Tin can Sweet wrapper Coin (modern penny)	Record the finds using the same methodology as in activity 4 and also photograph some finds and make accurate drawings of others.	**Resource 5**: Find Recording Sheet and how to record finds	**Resource 16**: instructions for find photography and drawing. **Resource 17**: Stone flakes

No.	ACTIVITY TITLE	TEACHER & PUPIL INTERACTION	PUPIL ACTIVITY	PUPIL RESOURCES	TEACHER RESOURCES
14	**Exhibition**	Let's set up the exhibition. Where shall we hold it? How do we get people to come and see it? What shall we include?	The exhibition might be set up in the school, Penmaenmawr Museum or possibly an event held by Carneddau Partnership. Children select pieces to include in exhibition and to choose how it is to be laid out. They need to decide how much explanatory text is needed and what that should be drawing on their research. This might just be captions for the images, which tell the story. The children can imagine that they are an advertising company that needs to advertise the exhibition. How would they do this?		

2.2. Resource 1: Archaeological tools

Trowel – This is used to scrap away soil to expose archaeological layers or the stones of walls. It can be used to scrap the surface of the soil clean and flat so that different soil colours can be seen.

Hand shovel – To clear up the soil scraped loose by the trowel. The hand shovel is used to put the soil into a bucket and it is then dumped in a pile away from the excavation.

Brush – To cleaning loose soil off stones, making them easy to see and so they look good in photographs.

Tape measure – For measuring to draw an accurate plan of the archaeology and to measure the exact location of objects that are found.

Gloves – To protect your hands when you are digging all day.

Pencil – To draw a plan of what you find.

Context sheet – To record measurements and notes of the soil layers and other archaeology.

Camera – To make a photographic record of what is found. Photographs are taken at all stages of excavation.

Finds tray – When you find an object it can be placed in the tray. At the end of the day all the finds from one layer are put into a bag and labelled so we know where they come from.

2.3. Resource 2: What is archaeology?

What is Archaeology?
Archaeology is the study of human history and prehistory through physical remains, including buried remains, buildings and objects. Archaeologists do not study dinosaurs, as there were no people around then, but they do study other animals and plants that might tell them about how people lived. Archaeologists plan earthworks (lumps and bumps in the ground), they use geophysical survey to see beneath the ground, they study buildings, investigate past environments and look at past peoples directly by studying their bones. Archaeologists use old maps and historical documents to find out about sites to investigate on the ground, and might even record the memories of living people. But archaeologists are best known for carrying out excavations.

Doing a geophysical survey

What is an Archaeological Excavation?

An archaeological excavation involves methodically removing layers of soil to expose and understand the buried remains of past human activity. These remains might include walls, pits, ditches and the layers of soil. Within the soil might be archaeological objects or "finds". These can tell us about the date of the activity and what was happening, but they can only do so if we know what layer they came from. Within the soil there might also be bones, of humans or other animals, charcoal and other charred plant remains and other evidence of what was happening on the site.

Digging on an archaeological excavation. It can be slow and careful, but it can be hard work

Archaeologists often hoe a site to clean it and make it easy to see changes in soil colour that show where pits or ditches were dug in the past

To understand all this information an archaeologist must record what they find. This is done by making written notes, scaled drawings, and taking photographs. A survey quality Global Positioning System (GPS) kit is now often used to survey the site and make sure everything is accurately located. Recording might also now be done by laser scanning or 3D models produced from photographs, but drawings are still often done by hand. All finds are labelled with the number of the layer they come from and are often also surveyed in three dimensions.

Volunteers excavating at Tai Cochion Roman settlement, Anglesey (David Hopewell)

Once all the information has been collected it must be processed, studied, interpreted and pulled together into a report. To add to our total knowledge of the past the results of an excavation have to be available to everyone to read.

Who does archaeology?

Most archaeology is done as part of the planning process. If someone wants to build some houses they need to get planning consent from the local council and that consent will often include a requirement to investigate archaeology that might be damaged or destroyed by the development. The developer must pay for that investigation and the work is carried out by experienced professional archaeologists working for an archaeological company.

A team of professional archaeologists

However, other people can get involved in archaeology. Archaeology at risk from natural causes, such as coastal erosion, might be recorded with the help of volunteers. Universities and other organisations carry out excavations and other studies to answer specific research questions, and this work might involve students or volunteers. Some archaeological or historical societies carry out excavations. Anyone can report finds of ancient objects to the Portable Antiquities Scheme (https://finds.org.uk/) so that they can be recorded, or photograph possible ancient remains and notify the Historic Environment Record (http://www.heneb.co.uk/newher.html).

Volunteers digging at Hen Gastell, Llanwnda

2.4. Resource 3: What does an archaeologist do? (PowerPoint)

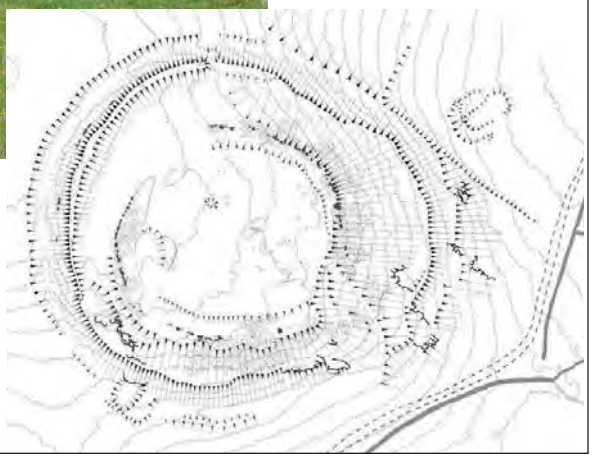
What does an archaeologist do?

Research
Before excavating an archaeologist will try and find out as much as possible. They might use historical documents, aerial photographs and particularly old maps.

Map dated 1817 of an area near Holyhead, showing farms and fields that no longer exist (image courtesy of Archives and Special Collections, Bangor University, Penrhos II 804)

Doing a geophysical survey

A plan of lumps and bumps that can be seen to be the ditch and bank of an Iron Age fort



Survey
To get an idea of what might be buried a geophysical survey uses a machine to detect changes in the soil and reveal the buried archaeology. Or a detailed plan of lumps and bumps in the ground show what is hidden underneath.

Excavation often involves digging carefully with a trowel

But sometimes it can be hard work

Trowel

And often archaeologists clean the soil with a hoe so they can see different colours clearly

Excavation

Layers of soil are methodically removed to expose and understand the buried traces of past human activity and objects that can tell us what was happening in the past.

Drawing

Taking notes

Lifting a pot and placing it in a box

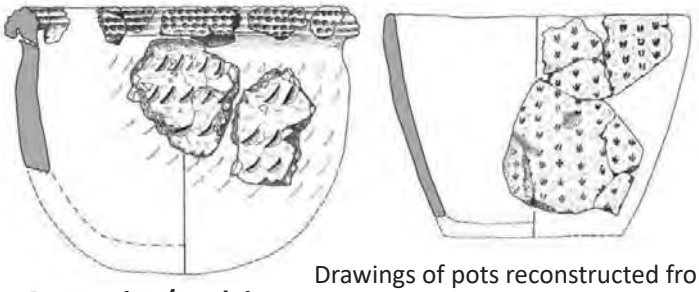
Record

Archaeologists need to record everything they find by drawings, notes and photographs. They carefully collect objects and box or bag them safely.

Processing soil samples

Charred grain from the soil samples

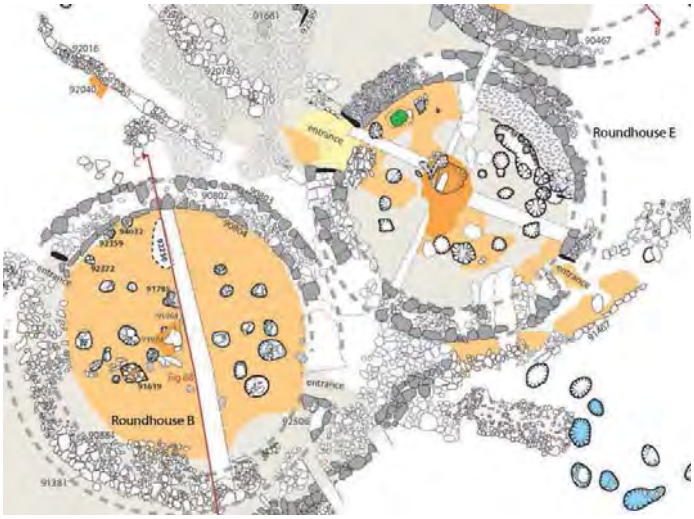
A specialist looking at plant remains to identify them



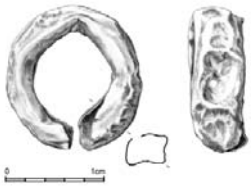
Drawings of pots reconstructed from fragments

Processing/studying

Everything collected during the excavation needs to be processed and studied. Objects are cleaned and soil samples are processed to recover plant remains and other things. Specialists identify and date the objects and plant remains. The excavation records are studied and an plans combined so that the site can be understood.



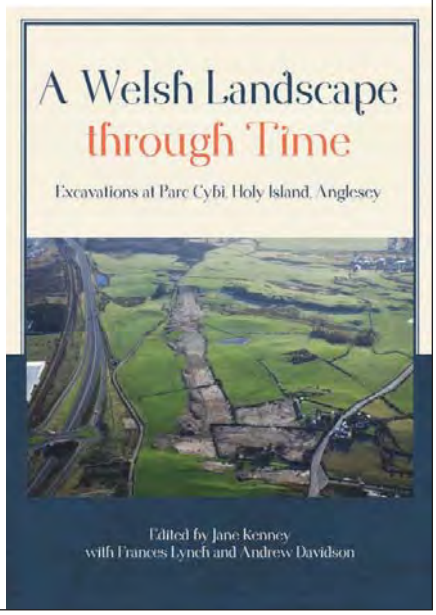
Final drawings are created showing what was found



Important finds are drawn

Lots of writing is done

Perhaps the report will be published as a book



Report

A report tells everyone what was found in the excavation so that other archaeologists can learn from it and anyone can find out about their past.

2.5. Resource 4: Archaeological word list

Archaeological specialist – someone who specialises in a small area of study, such as certain types of finds or the application of scientific techniques to archaeology. They can study their discipline in detail and can help other archaeologists make the most from their discoveries.

Archaeology – the study of human history and prehistory through physical remains, including buried remains, buildings and objects.

Axe – a tool used to cut down trees.

Axehead – the blade of an axe. In the Neolithic period these were made of stone.

Dig – an archaeological excavation.

Digger – an archaeologist who works on an excavation.

Earthworks – if there is a ditch, bank or partially demolished wall buried underground it might show on the ground surface as vague lumps and bumps. From the shape of these it might be possible to tell what used to be there and that there could be buried archaeological remains under the soil.

Environment – the natural surroundings in which people live, including the climate, plants and animals, air, water and land. The environment in the past was different to that today.

Excavation – the exposure, recording and recovery of the buried remains of past human activity.

Find – When archaeologists talk about "finds" they mean old objects that they have discovered through excavation or other means. Finds are often things that people have thrown away, and they are often broken, but by comparing many of finds and where they come from it is possible to get a lot of information from even a small broken piece of pottery or chip of stone.

Flint – a stone made from the decay of the bodies of tiny sea creatures millions of years ago. Flint is found in chalk rocks, and as there is no chalk in North Wales, flint is rare here. However, some can be found on beaches where it has eroded out of material dumped by glaciers and now under the sea.

Geophysical survey – a range of techniques used to detect archaeological remains in the soil without digging. These usually involve methodically walking over an area with the equipment as it detects differences in the soil. This leads to a plot showing the readings which can be used to identify archaeology.

Global Positioning System (GPS) – satellites send signals that can be used to find out where you are anywhere in the world. The satnav in the car does this and so do hand held GPS units that people use when they go walking, or a mapping app on a phone. Archaeologists use very accurate GPS equipment that can give a location to the accuracy of a centimetre or less.

Historical document – anything that was written and drawn in the past but not published in a book. This might be a letter, a will, a list of workers paid, a hand drawn map or old family photographs. Many historical documents are kept safely in local Record Offices or in the National Library of Wales, where people can go and look at them and study them. Some of the most useful historical documents for archaeologists are called Tithe Maps. These are detailed maps made in the early 1800s and they come with a list of who owned and worked the land and the names of fields. You can see the tithe maps of Wales online. Go to https://places.library.wales/. Under "Find a modern place" select where you live from the list. The map shows what it looks like now. On the right hand side tick "Tithe map overlay" and you will see the old map showing what it used to be like. Click on a blue marker and it will tell you about that field.

Mesolithic – (Middle Stone Age), from about 11600 years ago to 6000 years ago (in Britain). People lived in small groups in the forested land and lived by hunting wild animals, collecting wild plants and fishing and collecting shell fish.

Neolithic – (New Stone Age), from 6000 years ago to about 4500 years ago (in Britain). Farming was introduced to Britain and people kept cattle and sheep and grew wheat and barley. They made small clearings in the forests to grow their crops and graze their animals.

Palaeolithic – (Old Stone Age), from the start of human prehistory until the end of the last Ice Age, about 11600 years ago, when humans evolved and spread round the world.

Plan – a measured drawing done by archaeologists to represent what they have exposed during an excavation, such as the stones of a collapsed wall, the shape of a pit, the outline of a dark patch of soil from burning on a hearth.

Prehistory – the time before written history. In Britain this is everything before the Romans introduced writing less than 2000 years ago.

Remains – the physical traces of buildings and other things (including people) buried under the soil and found by archaeologists. These might be wall foundations, pits, ditches, holes that had once held the posts of a wooden building, or a skeleton (human remains).

Stone Age – Prehistory is often divided up into three ages; the Stone Age, the Bronze Age and the Iron Age. The Stone Age is the oldest of these ages and covers all of human prehistory from about 3 million years ago when the ancestors of humans appear right up to when copper and bronze started to be used (about 4500 years ago in Britain). That is a very long time, so it is divided up into periods; the Palaeolithic (Old Stone Age), Mesolithic (Middle Stone Age) and Neolithic (New Stone Age).

2.6. Resource 5: Find Recording Sheet and how to record finds

How to record finds

Archaeological finds are given a number so that it is easy to see which find is being described. Select a find, write 01 in the first line of the Find List and say what the find is. Put the find in a bag and 01 on the bag. Take the find out of the bag for recording but remember to but it back into the correct bag afterwards. Number each find in the same way, giving them a continuous sequence of numbers.

To record the find on the Find Recording Sheet:-
Write its find number on the Find Recording Sheet.
Find type – write what the find is just using a few words, e.g. stone flake, piece of pot.
Material – what is it made of? Is it pottery, stone, clay, paper, wood etc?
Size – with a ruler or tape measure the longest distance across the object (that is its length), measure the distance across the object at right angles to the length (that is the breadth). Measure how thick it is (its thickness). Write these on the form.
Date – do you have any information about how old the object is or what archaeological period it comes from? Can you guess how old it is?
Description – look closely at the object. Describe its shape, its colour, any decoration or writing on it. Is it rough or smooth or shiny? Is it broken or damaged? Is it just a small part of an object and if so which part? Do you know what it was used for?
Sketch – draw a sketch of the object. This doesn't need to be very accurately measured; it is just a rough sketch to show what it looks like. If there is anything unusual or important about the object label it on the sketch.

FIND RECORDING SHEET		**Find Number**
Find Type What is it? Just use a few words e.g. piece of pot		
Material What is it made of?		
Size		
Length	Breadth	Thickness
Date Do you know how old it is or what archaeological period it is from?		
Description Describe the find in as much detail as possible.		
Sketch Draw a sketch of the find and label anything of interest.		

FINDS LIST

Find number	Find Type

2.7. Resource 6: The Neolithic Period

Neolithic Britain

The Neolithic period (about 4000 BC to 2200 BC) is when farming was first introduced to Britain, along with new technologies such as pottery. Historic England has a useful timeline with information about prehistoric periods https://heritage.candle.digital/prehistory/. Use the Neolithic section of this to find out about the Neolithic period. You can also download it as a PowerPoint presentation (https://historicengland.org.uk/services-skills/education/teaching-activities/timeline-stone-age-to-iron-age/).

Forestry and Land Scotland also have a lovely booklet about the Neolithic in Scotland https://forestryandland.gov.scot/images/learn/archaeologyandheritage/The-First-Foresters.pdf. See p16 for the environment in the Neolithic. The environment in Scotland was similar to that in Wales at the time.

Neolithic Wales

Included below are links to the Royal Commission of Ancient and Historic Monuments Coflein website. Most of the links take you to maps and you can click on the red dots to find out about specific sites. Other links take you directly to a page about a site.

Across Britain in the Neolithic period forest dominated the land and Neolithic people had to clear small areas for fields and to live in. However, in Wales the mountains would have been clear of trees and could have been good grazing land. The coasts probably had only light scrubby woodland and wild grazing animals and beavers would have created natural clearings in the forest.

People lived by growing wheat and barley in small fields and grazing cattle on the more open land. They had some sheep and goats, and pigs foraged in the woodland.

Goat being milked (by Helen Flook)

Some people built large wooden houses, or perhaps they were halls. Remains of these have been found in Scotland and Wales, though fewer have been found in England.

In north-west Wales remains of these large houses have been found at Llandygai near Bangor, Parc Cybi, Holyhead and Llanfaethlu on Anglesey. These have all been found during archaeological excavations in advance of development.

Reconstruction of Neolithic house found at Parc Cybi, Holyhead (by Helen Flook)

A reconstruction of a late Neolithic house based on ones excavated at Durrington Walls, Wiltshire
(Attribution: TobyEditor, CC BY 4.0 https://creativecommons.org/licenses/by/4.0)

Towards the middle of the Neolithic period these big houses weren't built anymore and people generally lived in small huts, though some very big stone buildings were built on the Orkney Isles, north of the Scottish mainland. See https://www.nessofbrodgar.co.uk/ to find out about the amazing site of Ness of Brodgar.

These huts are usually seen in the archaeology as small groups of pits, perhaps with some postholes where the wall posts stood. The pits usually contain pot fragments and other rubbish from the use of the hut. Sites like these have been found in several places on Anglesey and in Gwynedd, where commercial archaeological excavation has been carried out.

The Neolithic people built large tombs for their dead. In Wales most of these tombs have chambers built of large stones covered with mounds of stones. These were not for a single person, but for everyone, all in one tomb. However, it is rare to find a complete skeleton in a Neolithic tomb. The bones were rearranged and some bones were removed for use in rituals. The tomb seemed to transform the individual dead into The Ancestors, with powers to look after their descendants. Tombs may therefore have been for worship and to mark territory, rather than just to bury the dead. Many of these tombs can still be seen on Anglesey, including Bryn Celli Ddu near Llanddaniel Fab (http://bit.ly/3cmr9tM) and the Trefignath tomb (http://bit.ly/3pthUf0) on the edge of Parc Cybi, Holyhead. There is a pretty little tomb above Rowen in the Conwy Valley, called Maen y Bardd (http://bit.ly/39r0XfW). To find out about these tombs follow the links next to the site name to the Coflein website.

To investigate Neolithic tombs on Anglesey go to https://bit.ly/3qV2hwQ
To investigate Neolithic tombs in Gwynedd go to https://bit.ly/3ttsIvd
To investigate Neolithic tombs in Gwynedd go to https://bit.ly/3bUu3oS

Maen y Bardd Tomb, Conwy Valley

Trefignath Tomb, Holyhead (copyright Mick Sharp)

Some human remains are also found at sites known as causewayed enclosures, defined by ditches dug in short sections. These were places where people gathered for meetings and ceremonies. In Wales causewayed enclosures are rare and mainly found in eastern Wales https://bit.ly/3tvfw9m. Later in the Neolithic period big circular monuments, known as henges, defined by a deep ditch, usually with a bank outside, were built for gatherings. Go to http://bit.ly/3eO1RG5 to see where henges have been found in Wales. There are several sites in south-west Wales but many of these are uncertain and have not been tested by excavation. There are also two henges just outside Bangor that don't show up on this map.

Stone axeheads were often buried in henges as offerings. Two henges were investigated just outside Bangor before the Llandygai Industrial Estate was built (http://bit.ly/3cfoORr). There was also a long monument defined by a ditch, known as a "cursus". This may have been used for ritual processions. Most cursus monuments in Wales have been found in the east (http://bit.ly/3eNOMN7), but again not all the examples recorded are certain.

Neolithic Tools

Neolithic people had no metal tools. For sharp cutting tools they used stone, mainly flint, which flakes to produce a very sharp edge. They used flint to make arrowheads for hunting and for fighting. These were tied on to arrow shafts with cord and glue.

Flint arrowhead from Parc Cybi, Holyhead

Neolithic hunter (By Carl Parry. Copyright: Wrexham County Borough Council & Bark Design)

Flint was also used for knives and for scraping tools. Scrapers were needed to scrape fat off animal skins to produce leather. Leather would have been very useful for clothes, coverings, possibly tents, and to make containers and bags.

Stones could be used as hammers and flat stones were used for grinding, such as grinding grain. Stone axeheads were very important in the Neolithic and we will look at those later.

Archaeologists often find stone tools because stone doesn't rot away in the soil like other materials. Tools would also have been made out of bone and antlers, but these are less often found. Bone could be used to make thin needles for sowing and shoulder blades of cattle were used as spades. Antler is harder than bone and small antler hammers were used to knap flint and make other tools. Antlers could also be used as picks for digging and quarrying.

Replica Neolithic tools: two axes, two adzes (for working wood) and some bone tools (credit AncientCraft – James Dilley)

Making a basket (By Carl Parry. Copyright: Wrexham County Borough Council & Bark Design)

Baskets must have been use to contain and carry all sorts of things, but they do not survive, except the some pots seem to have been decorated to look like baskets.

Wood was used for building but also for making objects. There must have been wooden bowls and trays, but again they hardly ever survive. A bow made from yew wood was found in Scotland in a boggy place called Rotten Bottom (http://merlintrail.com/the-moffat-history-trail/).

String made form nettle fibres or fibres from tree bark must have been used for all sorts of jobs. In the Outer Hebrides of Scotland a site underwater in a small loch produced heather rope that dated to the Neolithic.

We don't really know what kind of clothes people wore as these are almost never found. They could have made clothes from leather, but plant material, such as rushes could have been woven into cloaks and hats. There were sheep but they had not yet been bred to be very woolly. However, it is likely that their soft under-hair could have been plucked and spun to produce woollen thread. Occasionally charred seeds of flax are found on Neolithic sites so they were growing flax, which can be used to produce thread to make a cloth known as linen. Neolithic people could therefore have been wearing clothes made from woven fibres, but maybe this wasn't very common. They could also have been making bags and sacks out of coarser fibres. Imprints of woven textiles are very occasionally found on pots. These are generally the coarser types of fabrics.

Clay pots were a new technology in the Neolithic. They were used for cooking and storage. Pots were fired in bonfires, so they weren't as hard as later pots fired in kilns at a higher temperature.

Neolithic Art

The Neolithic period may have been brightly coloured. At the amazing site of Ness of Brodgar in Orkney traces of paint were found on the walls of the Neolithic buildings (https://www.nessofbrodgar.co.uk/painted-walls/). This paint was made from iron-rich rock and yellows, reds and browns could be produced, as well as black from charcoal.

Paint found on a stone in a house wall at Ness of Brodgar (credit ORCA)

Stones at the Ness of Brodgar were also decorated by scratched lines, mainly zigzags and cross hatching.

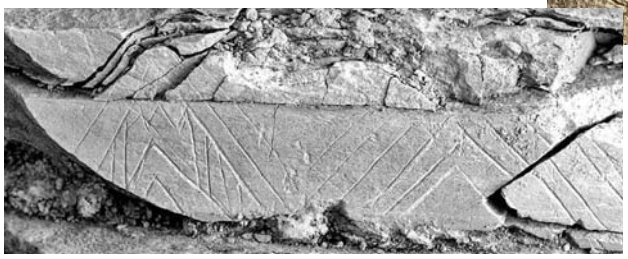
These patterns give ideas of what might also have been painted on the walls or patterns used in clothing or tattooed on people's skin.

Scratched patterns on stone from Ness of Brodgar (credit Ole Thoenies)

credit Mick Sharpe

credit Nick Card

credit Ole Thoenies



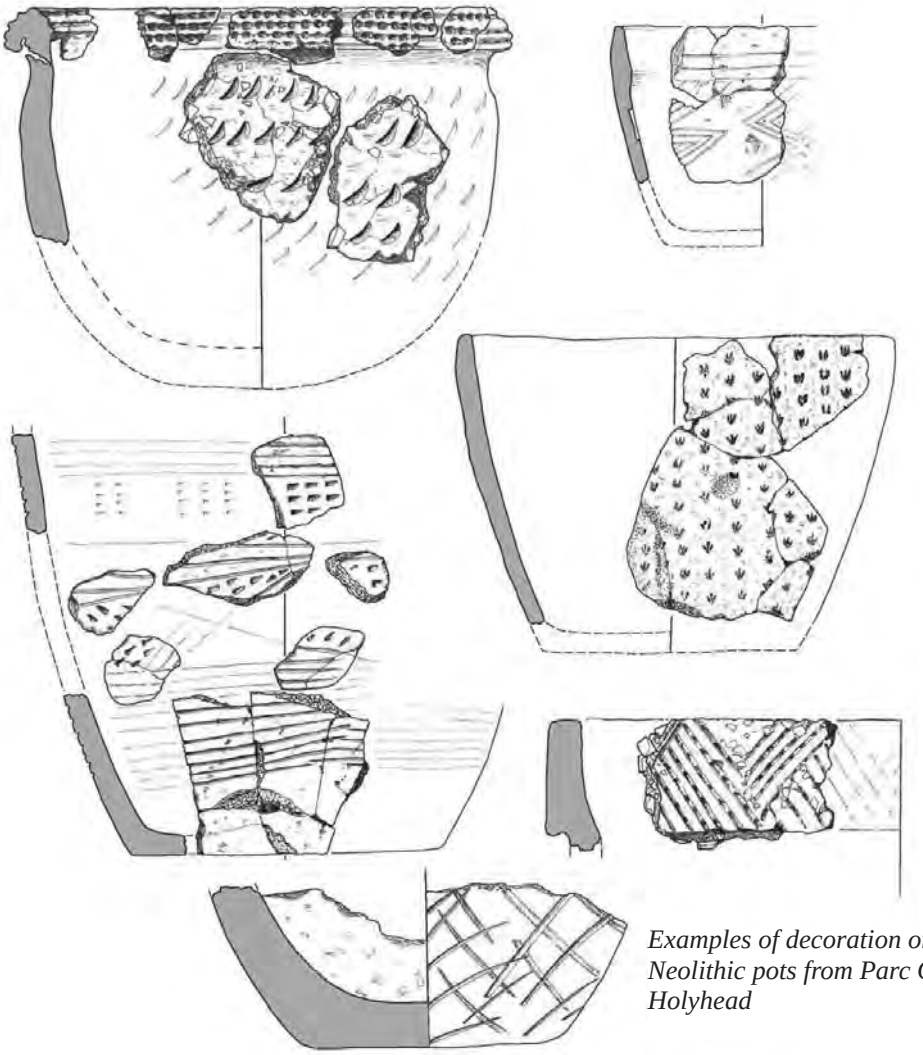
credit Ole Thoenies

credit Nick Card

credit Nick Card

Patterns found on stones at Ness of Brodgar, including the Brodgar Butterfly pattern (bottom right)

Carvings are also found in some Neolithic tombs. There are ones at Barclodiad yr Gawres near Rhosneigr on the west coast of Anglesey (http://bit.ly/3t4QMW1) and there was a decorated stone at Bryn Celli Ddu. You can visit these tombs and see the decorated stones. Neolithic pots were also decorated. Here are some examples of Neolithic pottery decoration. These are made by pressing bits of cord, twigs, bird bones and finger nails into damp clay before the pot is fired.



Examples of decoration on Neolithic pots from Parc Cybi, Holyhead

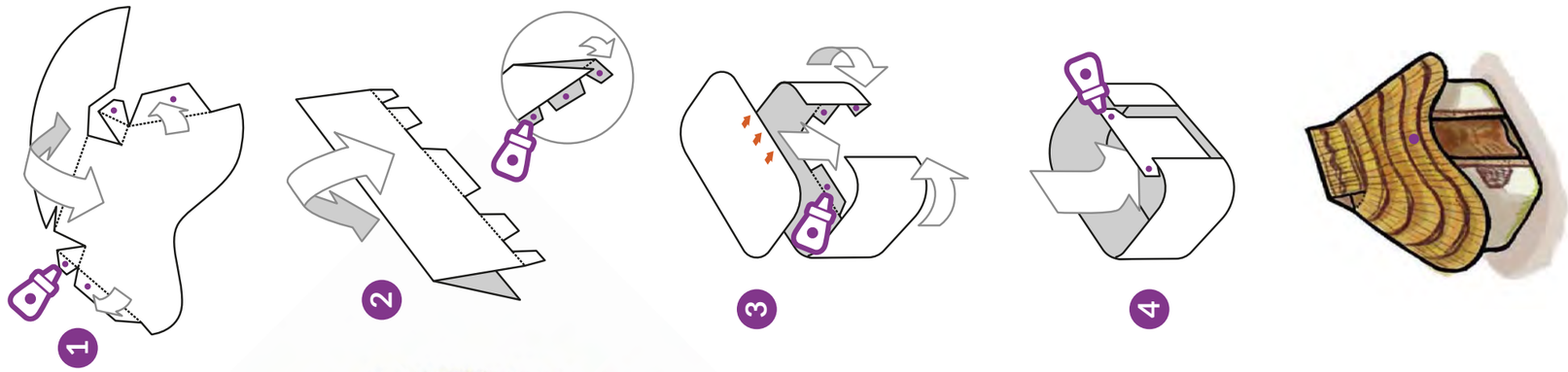
Neolithic art at Penmaenmawr

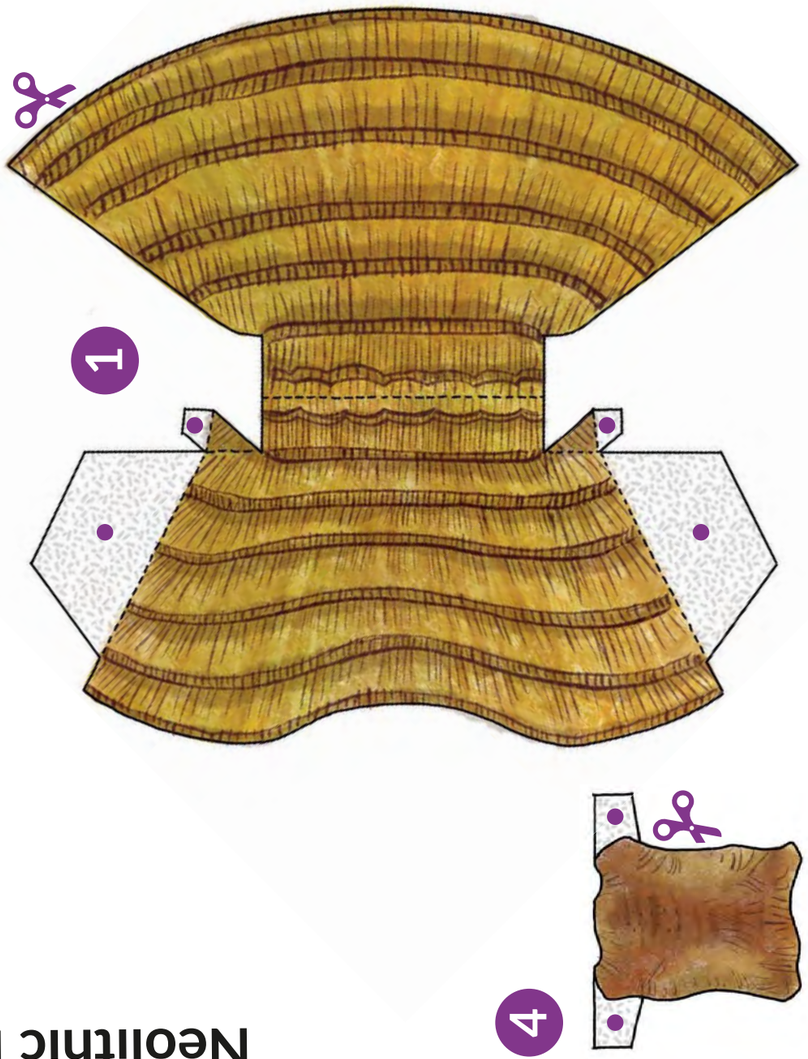
In the early 1920s excavations near Graig Lwyd at Penmaenmawr found large quantities of remains from making stone axes in the Neolithic period. Also found was a small pebble, with faint lines scratched into it. This seems to be a type of decoration or perhaps it had some other meaning. The stone is very hard so it would not have been easy to make the scratches.

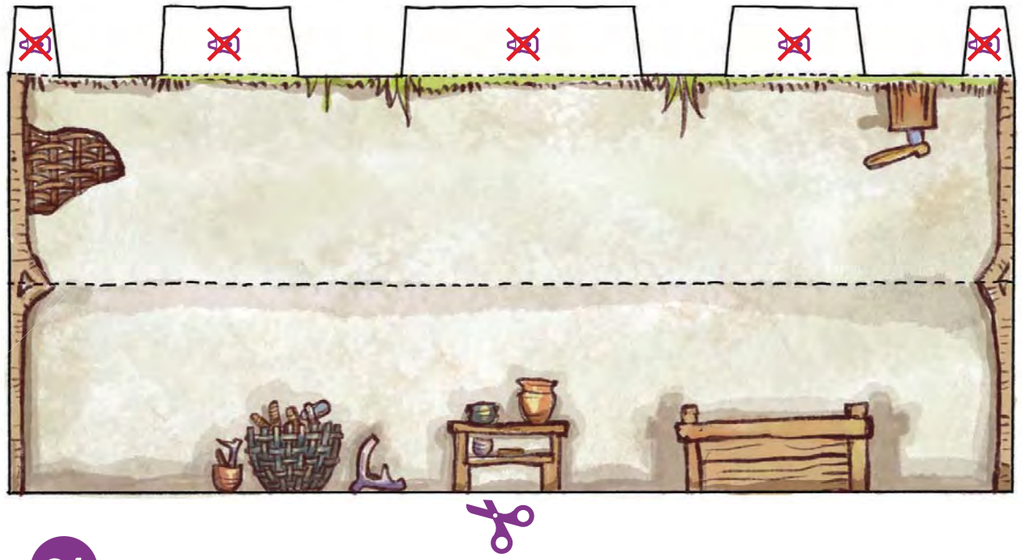
Drawing of the pebble (from Warren 1922, p29)

Photograph of the pebble (copyright National Museum Wales). The scratches are hard to see on the photograph, which is why a drawing is useful to bring out important details.

make your own
Tŷ Neolithig







make your own
Neolithic House

www.penmaenmawrmuseum.co.uk

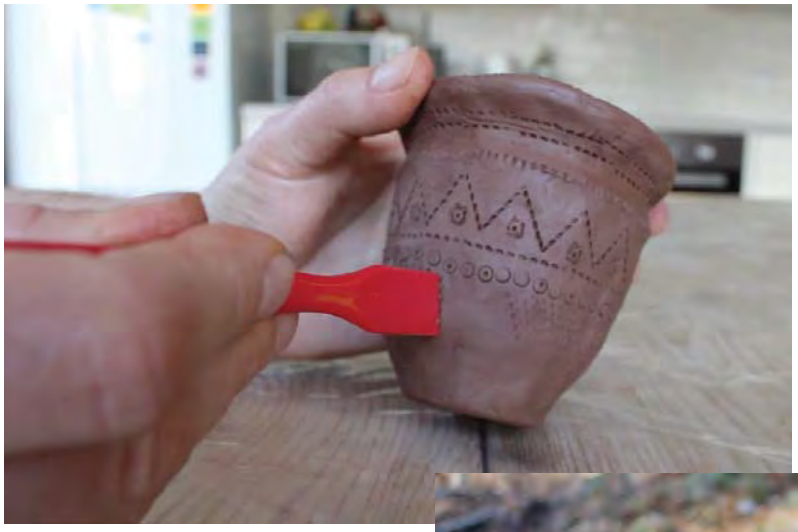
Dylunio a darlunio/Design & illustration: david@goodman.graphics

2.8. Resource 7: Make your own Neolithic house

Cut out and fold paper craft model of a Late Neolithic house designed and drawn by David Goodman, commissioned by Penmaenmawr Museum for this resource.

2.9. Resource 8: Making a Neolithic pot

As part of the Cadw grant aided element of the production of this resource Dan Amor of GAT produced a video showing how to make a replica Neolithic pot. This has been produced in Welsh and English and British Sign Language will be added to make this accessible a wide range of potential users.



Images from the video

2.10. Resource 9: Neolithic Food

The Neolithic people had domestic animals and crops but could also collect food from the wild. But many foods that we have today were brought into Britain from elsewhere in the world a long time after the Neolithic period. They would have had quite different foods to us.

Food Neolithic people had

Food	**Where did it come from?**
Bread/flour	From wheat that they grew in small fields
Porridge	Made with wheat or barley grains from the fields, not with oats, that came later
Beef	From the domestic cows they kept
Mutton	From the domestic sheep they kept
Pork	They also sometimes kept pigs
Milk/cheese/yogurt	They could get milk from their cows and sheep, but humans have evolved to drink milk since the Neolithic people so drinking milk would have made them fell unwell. Milk would not have kept long without fridges, so it was much better to turn it into cheese, butter or yogurt, which they would have been able to eat with no problem and would keep much longer. They may even have made an alcoholic drink from milk like people in Mongolia do today.
Green vegetables/salad	Lots of wild leaves are edible and very good for you, and some would have grown in and around the arable fields. Some of these may have been deliberately planted in gardens. Examples that Neolithic people probably ate are Fat Hen (https://www.wildfooduk.com/edible-wild-plants/fat-hen/), hedge garlic or garlic mustard https://www.wildfooduk.com/edible-wild-plants/hedge-garlic/, and on the coast they could find sea beet with leaves like spinach https://www.wildfooduk.com/edible-wild-plants/sea-beet/.
Herbs	Lots of plants can add flavour to food. Wild garlic grows widely in woodlands even today https://www.wildfooduk.com/edible-wild-plants/wild-garlic-2/, lady's smock or cuckoo flower has mustard flavoured leaves and mustard like seeds https://www.wildfooduk.com/edible-wild-plants/ladys-smock-1/. It would grow in the cow pastures. Wood sorrel has a nice lemony taste https://www.wildfooduk.com/edible-wild-plants/wood-sorrel/.
Fruits	There is not much evidence that Neolithic people domesticated fruit trees but there would have been lots of different fruits in the woods around them in the autumn. They may have looked after special trees to make them fruit better. Fruits that they would have eaten include; crab apple, hawthorn haws, rowan berries, sloes, rose hips, wild plums, wild cherries, bilberries, blackberries, wild strawberries.
Mushrooms	Wild fungi of all sorts would be found in autumn in the woods and pastures.
Honey	Wild bees would have lived in the forests and their hives would have been raided for honey. There is no evidence that Neolithic people kept bees but the evidence would be hard to find so perhaps they did.
Salt	You need to eat some salt to be healthy and it is very useful for preserving meat. People who lived near the sea could get salt by boiling down sea water. Later on in prehistory people traded salt. There is not much firm evidence for this in the Neolithic but people living inland would have needed salt and it is likely that they got it from people living on the coast.
Beer	Wheat or barley could have been used to make beer.

Food Neolithic people did NOT have

Food	Where in the world did that come from?
Potatoes	South America
Sugar	Sugar cane was first grown in New Guinea
Chicken	Southeast Asia
Turkey	North America
Cornflakes	Corn/maize used to make cornflakes came from South America
Oranges and lemons	Southeast Asia
Big, sweet fruit	Fruit trees were only domesticated after the Neolithic period so they didn't have any big, sweet fruits, not even an apple as we know them.
Rice	China
Chocolate	South America
Coffee	Ethiopia
Tea	China

Food Neolithic people could have had, but didn't eat

Food	
Fish	Many Neolithic people across Britain lived near the sea but analysis of their bones shows that they didn't eat sea fish. This is very odd as fish is a good food. Perhaps there was a cultural or religious reason why they didn't eat fish.
Venison	Neolithic people did hunt some deer in the forests but they didn't eat venison very much. Deer antlers used to make tools are found more often than remains of deer as meals.

Neolithic cooking

Neolithic people would have cooked on an open fire but they had the new technology of pottery which made cooking easier than it was for earlier peoples. A round bottomed pot could rest in the fire and cook a stew or warm milk for making yogurt. We know what they cooked in pots because fat from the food soaked into the pottery, was preserved for thousands of years and can be analysed today. From this we can see that they cooked meat, beef and pork, in pots, probably for stews. They also used pots to make or cook foods from milk, such as cheese, butter and yogurt.

They could also roast meat over the fire and use a flat stone as a griddle to make early Welsh cakes and flat bread. Sometimes archaeologists find small pits lined with clay and full of heat-cracked stones, that were sealed over with earth or turves. They would have worked as ovens. A fire would heat the stones, then food wrapped in leaves or straw could be placed on the hot stones and covered with earth to seal the heat in. It would be left for a couple of hours to cook. Meat could be cooked like this, as well as plant roots and other plant food. Towards the end of the Neolithic period a new trend started; boiling large pieces of meat in a trough. A pit was dug, often lined with timber or stone to make a neat trough, which was filled with water. A fire was lit next to the trough and stones heated on the fire. Hot stones were put into the water until it boiled. Meat was wrapped in straw and put in the hot water. Adding more stones kept the water boiling for as long as it took to cook the meat. Some people think that the same trough could have been used to make beer, so this might have been cooking for a party.

Storing and Keeping

Things like leather and baskets are not often found by archaeologists but they must have been used a lot. Neolithic pots were fairly small, if you wanted to keep or cook a large amount of liquid you would need a leather bag. If you made beer it would probably have been kept in a leather bag to ferment. Hot fat could be poured into a leather bag or a basket lined with leather, where it would set and could be stored. Fat helps to preserve food, so cooked fruit might be mixed with fat to make a tasty treat to be kept for the winter. Fruit, mushrooms, meat, and herbs could all be dried, probably by hanging them up in the roof of the house. They could then be stored in baskets or sacks. Wheat and barley must have been stored both to make flour and to keep for sowing to grow the following year. One Neolithic house that was found in Scotland had burnt down and there was a lot of burnt grain amongst the remains. Perhaps the grain had been stored in the roof of the house.

2.11. Resource 10: Clothes and keeping warm

Clothes and keeping warm

We don't really know what kind of clothes people wore as these are almost never found. They could have made clothes from leather, but plant material, such as rushes could have been woven into cloaks and hats. There were sheep but they had not yet been bred to be very woolly. However, it is likely that their soft under-hair could have been plucked and spun to produce woollen thread. Occasionally charred seeds of flax are found on Neolithic sites so they were growing flax, which can be used to produce thread to make a cloth known as linen. Neolithic people could therefore have worn clothes made from woven fibres. They could also have been making bags and sacks out of coarser fibres. Imprints of woven textiles are very occasionally found on pots. These are generally the coarser types of fabrics.

Leather must have been used to make outer clothes to keep off the rain, perhaps a cloak with a hood. Animal furs would have been used to make warm winter clothes. There were lots of animals in the forest with nice fur, including wolves and bears, but also beaver with thick water-proof fur and small animals like pine martin with fine fur. No rabbits though, they were introduced to Britain in the medieval period, or possibly by the Romans.

Neolithic houses would have been warm and weather proof, though no central heating. An open fire would give heat as well as being used for cooking. Furs might have been used for bed covers. Straw would have made a warm bed to lie on.

2.12. Resource 11: Neolithic Tools

Neolithic tools

 Credit AncientArts – James Dilley	Axe	Axe with polished stone axehead and wooden handle. Used for cutting down trees and wood-work.
 Credit AncientArts – James Dilley	Adze	Adze with polished stone adzehead and wooden handle. Used for wood-work. The blade is used horizontal to the wood to split, shape or level off wood.  By Pearson Scott Foresman, https://commons.wikimedia.org/w/index.php?curid=2488857
 Smithsonian Institution	Scraper	A shaped piece of flint set in a handle for scraping fat from skins to make leather.
 Neolithic flint knife from Parc Bryn Cegin, Llandygai near Bangor	Knife	A sharp piece of flint held in the hand can be used as a knife or the flint can be shaped to make it easier to use and possibly given a handle.

 By Wolfgang Sauber, CC BY-SA 3.0, https://commons.wikimedia.org/w/index.php?curid=7260399	Sickle	Flint flakes would be stuck into a wooden or antler handle to make a sickle. A sickle is a curved cutting tool used to harvest grain by cutting through the stems.
 Neolithic flint arrowhead	Bow and arrow	Arrow with a flint arrowhead, a wooden shaft and feathers to make it fly straight. The bow would be made from flexible yew wood. The bow and arrow would have been used for hunting, perhaps as much to hunt animals for fur as for food. But the bow and arrow was also a weapon. Some Neolithic villages have been found with lots of arrowheads scattered around, as if they had been attacked by bowmen. Some Neolithic skeletons have arrowheads embedded in their bones. The Neolithic period was not always a peaceful time.
 Real Neolithic wooden spoon from Denmark (National Museum of Denmark)	Spoon	Spoons were probably made from wood. None have been found in Britain but a Neolithic wooden spoon was found in Denmark. Sticks could be used for stirring.
 Copyright Museum of London	Bowl	Bowls for eating from might be made of pottery but they could also be of wood.
	Plate	We don't find any pottery plates so if a plate or tray was needed that might have been made of wood.

 © Historic England ref: aa81_01951	Cooking pot	Cooking pots were made of pottery.
 Copyright British Museum	Quern stone	A stone used for grinding grain to make flour. This is a flat stone that becomes curved in shape by wear. A smaller flat stone is used on top to grind the grain.  An African woman using a saddle-quern (Erwin Bolwidt, Creative Commons Attribution)
 Copyright British Museum	Plough-share	A long stone that would be attached to a simple wooden plough to dig into the ground and plough a field.  A similar plough being used in Nepal (copyright Jane Kenney)

 *Making a basket (By Carl Parry. Copyright: Wrexham County Borough Council & Bark Design)*	Basket	Baskets of all sizes would be used for holding and carrying things. They would be made of willow twigs, reeds and other plant materials.

2.13. Resource 12: Making a chambered tomb

Instructions are to be developed from guidance for a Young Archaeologist Club making session.

1

Ymddiriedolaeth Archaeolegol Gwynedd
Gwynedd Archaeological Trust

young archaeologists' club

Model Burial Chamber Activity

Make your own Neolithic burial chamber!

- This information sheet is for our online model burial chamber session, Saturday 27th February 2020, 2.00pm
- This sheet will tell you everything you need for the activity
- This sheet will show you some examples of burial chambers in north-west Wales

You will need…

Modelling material

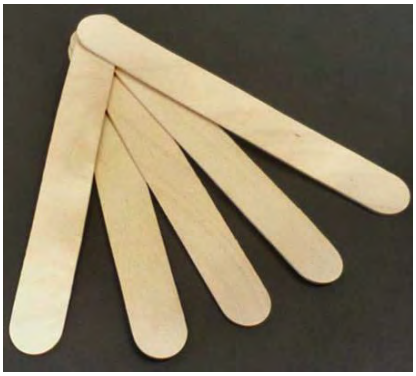
Ask your parents nicely if they can order some online, if you can't go to a shop. You'll need two colours. We used Fimo Soft (for the green 'grass') and Fimo Effect (for the grey 'stones'). We got ours from The Range in Bangor but lots of places sell it online. If you can't get green and grey you could use other colours.

Flat surface

A flat, hard surface for modelling the clay. Plastic on the table might be a good idea.

Craft tool / crafting stick

Or something similar, don't use anything sharp. You can usually get these from where you get Fimo.



A biro

Oven

The Fimo needs to be baked in an oven. Place you model on a piece of silver foil and bake at 110 °C for half an hour. Ovens are hot! Make sure the Fimo, foil and baking tray are cool before touching. Ask a parent to help.

Read the information section

Read through the information section before the session to learn about Neolithic burial chambers in north-West Wales.

Information Section

You can still see prehistoric tombs in the landscape of north-west Wales today, which is amazing when you think about it – because they were probably built in the Neolithic period – that's about 4000 to 2500 BC (between 6000 and 4500 years ago).

Some tombs were used over a long period – probably hundreds of years, and they were very important structures in the community. Many people would have been buried in them.

There are different types of burial chambers – some had long passages, some were simple boxes.

Each burial chamber would probably have been covered in earth and stones, like Bryn Celli Ddu, on Anglesey (see picture, below left). Most have now been 'robbed' (that means the stones have been taken away and used to make things like stone walls), leaving only the bare stone structures underneath, like Maen y Bardd, near Rowen (the second picture, below, right).

Bryn Celli Ddu, near Llanddaniel Fab, Anglesey.

Maen y Bardd, near Rowen, Dyffryn Conwy

- This burial tomb has had all the earth and stone laying over it 'robbed'
- It is also Gwynedd Archaeological Trust's logo!

2.14. Resource 13: Stone Axes from Penmaenmawr and Llanfairfechan

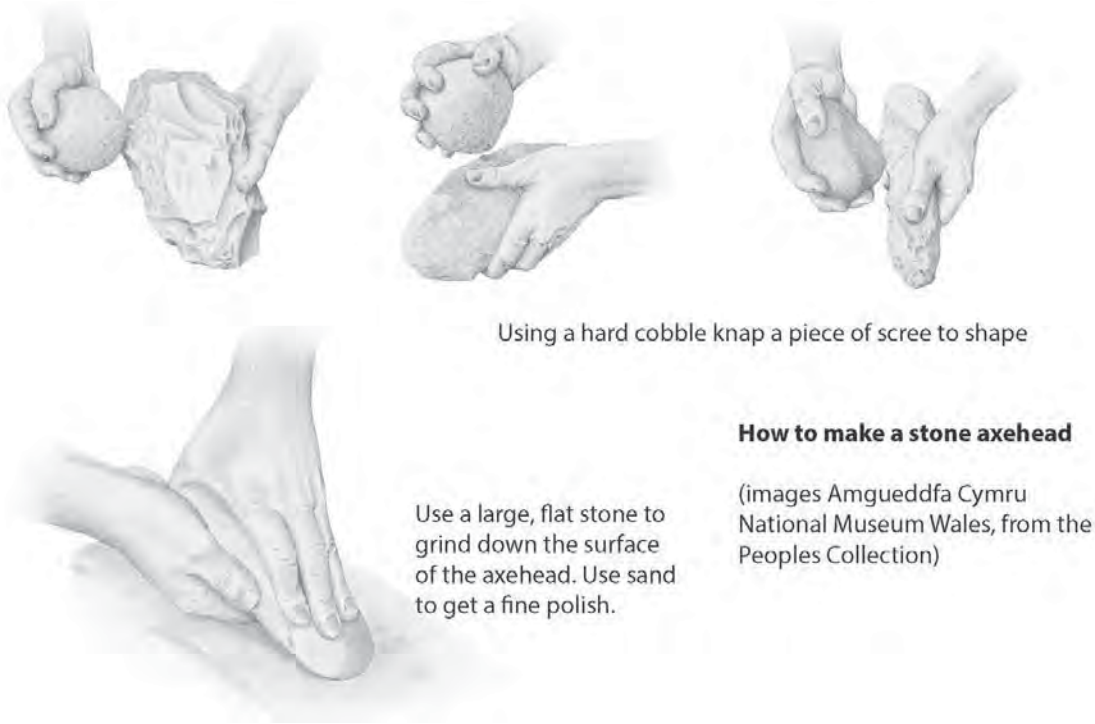
STONE AXES FROM PENMAENMAWR AND LLANFAIRFECHAN

Neolithic stone axes

In the Neolithic period people needed axes to fell trees to clear land for farming and to get timber for building houses and other monuments. As this was before metalworking, stone had to be used to make axeheads. In some places flint was used because it can be knapped (carefully flaked in a controlled manner) to shape an axehead, but where flint wasn't available fine grained volcanic rocks were used.

A genuine Neolithic stone axehead found still in its wooden handle in Cumbria (British Museum)

Neolithic stone axeheads were set in wooden handles, and axeheads still in their handles are very occasionally found in waterlogged sites, where wood survives. Large axes would have been swung like a modern felling axe to fell trees, but some axeheads were very small and could be used for fine work. After being knapped to shape, the axeheads were often polished all over, which takes a long time to do.



How to make a stone axehead

(images Amgueddfa Cymru National Museum Wales, from the Peoples Collection)

Y Graig Lwyd Quarry partly quarried away (photograph by G. I. Davies)

Making Neolithic Axeheads above Llanfairfechan and Penmaenmawr

Above Penmaenmawr and Llanfairfechan is Penmaenmawr Mountain, a shear craggy hill rising out of the sea. This used to be crowned by an Iron Age hillfort, known as Braich y Dinas, which was quarried away in the early 20th century. Running east from Penmaenmawr Mountain is a ridge called Clip yr Orsedd at the eastern end of which is a rock outcrop known as Y Graig Lwyd. This is also partly quarried away, and has with natural screes below it, mostly over grown with vegetation.

Llanfairfechan is also overlooked by the hills of Dinas and Garreg Fawr. Dinas is surrounded by screes and Garreg Fawr also has areas of scree, though much of this is under vegetation. All these hills are made of the same hard volcanic rock, ideal for making stone axeheads. In the 1920s Samuel Hazzeldine Warren, a geologist who

Penmaenmawr Mountain showing quarrying (Maldwyn Hughes, from the Peoples Collection)

Dinas (left) and Garreg Fawr (right)

holidayed in Penmaenmawr, carried out excavations and found that the scree below Y Graig Lwyd was used in the Neolithic period to make stone axeheads; he found tons of waste from making axeheads. In the 1990s excavations and test pits showed that axeheads had also been made on the top of Y Graig Lwyd and that the bedrock was quarried to make the axeheads.

Waste from making axeheads has also been found on Dinas and Garreg Fawr, showing that axeheads were also made here.

Roughout found at Graig Lwyd (Amgueddfa Cymru National Museum Wales, from the Peoples Collection)

Roughout found on soil surface near Dinas

Who used the Axes?

Many of the axes must have been used locally but axeheads from Penmaenmawr and Llanfairfechan have been found across Wales and England. These axeheads were used by people as far away as Cornwall and Yorkshire.

To find where some axeheads ended up in Wales go to https://museum.wales/collections/online/
Search "stone axe", then refine search with "VII" and stone axes held by the National Museum that have been identified as coming from Penmaenmawr/Llanfairfechan rock will appear. Click on these to see where they were found.

This wasn't trade in the way we now understand it. Stone axeheads were probably being given as gifts, passed from group to group. They would have been very important practical tools but they also seem to have been being special and valuable. Many axeheads have been found in Neolithic monuments, placed as offerings, often ritually broken, which shows their importance. Because they were polished it was easy to see what kind of stone they were made from, so people probably knew which axeheads came from Penmaenmawr and Llanfairfechan and which came for other stone sources. They may never have visited the coast of North Wales but they may have heard stories about where the axeheads came from.

What is the Evidence for Axe-making?

When Neolithic people wanted to make an axehead they found a piece of scree and tested it by knocking a few lumps off. If it did not seem suitable it was thrown away, if it was good they started to shape an axehead. Some axeheads broke while they were being knapped and these were also thrown away. These unfinished pieces are known as "roughouts", and where they are found it shows that people were making axeheads. The process also produces lots of flakes of stone chipped off during knapping. In places the scree is exposed and roughouts and flakes can be found on the surface, but in most places grass has grown over the scree and evidence for axehead making is hidden underground.

The flakes and roughouts are hard to spot. They look like normal stones unless you look very carefully. There are also lots of stone flakes made at a much later date. The volcanic rock was used in the 18th to 20th centuries to make paving stones, which were knapped to shape producing heaps of flakes. Some of the stones used in the stone walls built in the 18th and 19th centuries were also knapped to make their shaped more regular. Flakes of these stones can

be found near the walls, sometimes in the same places that Neolithic people were making axes. However, because the Neolithic flakes have been in the ground for thousands of years they have turned almost white on the outside. Later flakes are much darker, so it is possible to tell the difference.

Protection

The axe-making sites are very important in telling us how people lived in the Neolithic period. If they are disturbed or damaged this information might be lost. It is important not to dig or turn stones over in looking for axehead roughouts. We want to preserve this important landscape for future generations to explore.

However, if you find a roughout in your garden or loose on the ground surface it is very useful for this information to be recorded. It could indicate axe working in places not previously suspected. If you find an axehead roughout please send a photograph with details of where it was found to Sean Derby (sean.derby@heneb.co.uk) at the Gwynedd Historic Environment Record, so that he can record where it came from.

2.15. Resource 14: Map of stone sources and axehead finds

This map shows which rock outcrops and screes were used as sources of stone to make stone axeheads. It also shows where axehead roughouts have been found. The children can use this Ordnance Survey map to produce an attractive, easy to understand map for the exhibition showing where roughouts have been discovered. They can also indicate public footpaths so they can see how the landscape can be explored today. This encourages the children to look at and understand the Ordnance Survey map. The legend for the map, showing what the symbols are, can be found at:-
Welsh
https://www.ordnancesurvey.co.uk/documents/resources/25k-raster-legend-welsh.pdf
English
https://www.ordnancesurvey.co.uk/documents/25k-raster-legend.pdf

The map can be used for exercises in taking grid references and for understanding contours. Use the following links for information:-

Grid refs
https://www.bbc.co.uk/bitesize/guides/z6j6fg8/revision/4

Contours
https://www.bbc.co.uk/bitesize/guides/z6j6fg8/revision/3

Key

Finds of axehead roughouts

Stone sources for axeheads

Menai Strait

Traeth Lafan

Abergwyngregyn

PENMAENMAWR

LLANFAIRFECHAN

Penmaenmawr Mountain

Dinas

Map of stone sources and axehead finds

2.16. Resource 15: Searching for the Neolithic axe-makers

A short video will be made during the 2021 test pitting and excavation season at Ty'n y Llwyfan, Llanfairfechan. This will give a brief outline of why we have chosen to dig here, what the process is and what has been found. This will show volunteers at work and what doing archaeology is really like.

2.17. Resource 16: Drawing and Photographing Finds

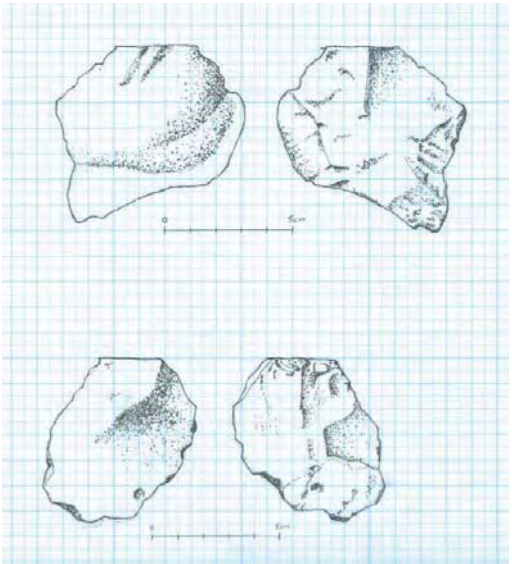
As well as the basic finds recording on the Finds Recording Sheets the children can do more detailed recording on these finds. This involves making an accurate measured drawing of a find or taking a photograph. Choose the best or most interesting finds and do either a drawing or a photograph.

As the finds are recorded on the Find Record Sheets remember to bag and number each find. The numbers can then be included on the drawings and photographs, so it is clear which find has been recorded.

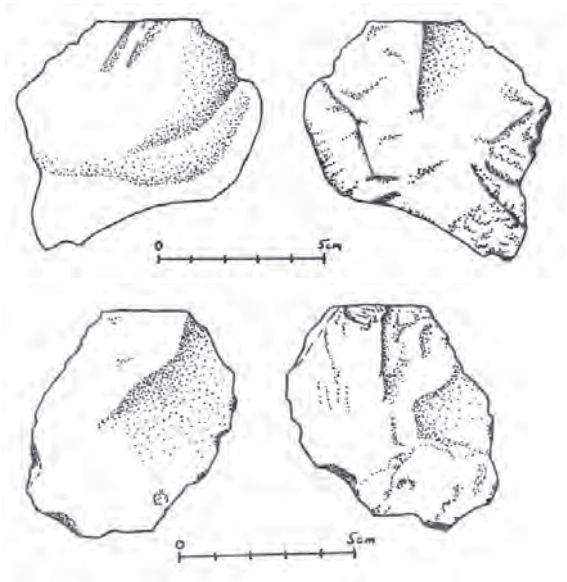
When drawing the stone flakes the children should look for the specific features that show that these flakes have been worked by people rather than being natural pieces of stone; they can mark those features on their drawings. **Resource 17** tells you about flakes.

Finds drawings

Choose one of the stone flakes with the most distinctive surface features or one of the other finds. Place it on a sheet of paper. With a pencil draw round it as close to the edge as possible. You need to get the shape and size as accurate as you can. Look at the surface of the flake. Undulations on the surface can show where other flakes have been taken off the same piece of stone. Draw any lines or cracks that you see. Use a ruler to measure in from the flake edge to features on the surface and measure to the same point on your outline so that you can draw the features accurately in the correct place. Use dots to create shading; the more dots the darker the shade. This can be used to show the curve of the flake. When you have drawn one side turn the flake over and draw the other side. Draw them side by side at the same angle so that they can be compared directly. Use your ruler to draw a 5cm scale beneath. Write the find number next to the drawing, so you know which one it is.



Examples of pencil drawings of flakes



The flake drawings inked up

When you have finished your pencil drawing take a sheet of tracing paper and fix it over the pencil drawing. With a pen trace very neatly over the pencil lines. Use a fine, extra-fine or ultra-fine black marker pen such as a Sharpie. If you have pens of different thicknesses, try using a thicker line to define the edge and thinner lines for the surface features. You may find that the shading dots are easy to do with a pen, so these can be done more neatly and perhaps more densely than they were in the pencil drawing. Trace the scale and label it neatly.

Find photographs
Place the object on a white or neutral background. Make sure you have good light. An angle-poise light with the daylight bulb is ideal, but taking the photo in a window with natural light can work well. Artificial light may give odd colours to the photo. If the object can be set up so that the light is low and casts shadows across it then details in the surface of the object can be highlighted. Experiment with the object and the light source to get the best position.

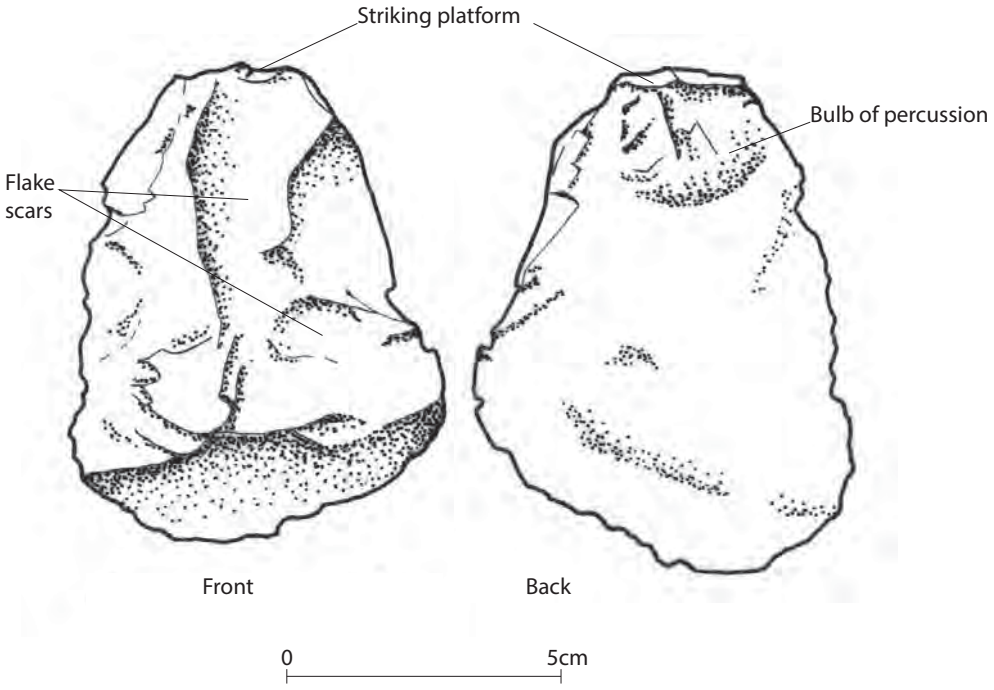
Cut out one of the photo scales supplied, and place it next to the object. Write the find number clearly on a piece of paper and place it so it will be seen in the photo. If the photos were done professionally a good quality digital camera would be used on a tripod, but try using any camera device available; phone, Ipad etc. Take the photograph from vertically above the object. You will have to keep very still if you don't have a tripod, but most devices should be able to give a reasonable result. Experiment with how far away you need to be from the object to get a sharp image.

Download the photographs. Choose the best one and if possible crop it so that only the object, scale and find number are included. If you have the software you could improve the image by increasing the contrast or adjusting the colour. Print the photograph out.

2.18. Resource 17: Stone flakes

Flakes
Flint or other fine grained stones, such as the volcanic stone above Penmaenmawr, can be shaped by striking off flakes of stone. This is known as knapping and is done by hitting the stone with another stone or piece of antler in a very skilled way. An experienced knapper can break off flakes exactly as they want and precisely shape an object or produce sharp flakes that can be used as cutting or scraping tools. Stone axeheads were shaped in this way from rough pieces of natural scree or quarried stone.

How do you know if this is a flake made by a person or just a piece of stone? Because the stone knapper strikes the stone in a specific way to produce a flake that flake has certain features. One of the edges is usually flat. This is the "**striking platform**", which is where the stone was struck to strike off the flake. The force of the blow causes the stone to break in a way that looks a bit like a shell with a rounded lump, called the "**bulb of percussion**" near the striking platform, and ripples running out from it. On the other side of the flake there may be scars of other flakes that were struck off the piece of stone before this flake was removed. These are known as "**flake scars**".



3. TRAINING RESOURCE

As part of the process of creating the school resource an exercise was devised involving writing a simple archaeological report. This is not appropriate for the school resource but is to be used for older children or as the basis for a basic level accredited course.

3.1. Training Resource Notes

The Project

This project is based on the idea that an archaeological trench has been excavated to investigate an area of Neolithic stone axe-making in the uplands above Penmaenmawr. The excavation itself is fictional, designed to be suitable for the training exercise, but the axe-making sites are real and the excavation is based on real work that will take place as part of the Carneddau Landscape Partnership Landscape of Neolithic Axes Project. We will use volunteers to dig trenches similar to the one in the pack, and will hope to get results that are as exciting.

The student is supplied with records from the excavation, including a plan of the trench, context sheets, specialist reports and they must write a report describing what has been found and interpreting its significance. The information in **Section 4** can be used for information about the axe-making activity in the area and other background, though GAT reports on the area can also be available. **Resources 2 and 6** above can also be used for background information.

The Report

Reporting on what was found in an excavation is critical to archaeology. Without reporting an excavation is just destruction. The information learnt from the excavation needs to be shared to be useful. Writing up an excavation uses a wide variety of skills reflected in the tasks in this exercise.

The resources below represent the field records that would be produced by the excavation and other information that would be obtained.

The excavation report is to include:-

General Background

When was the Neolithic period?
What was the environment like in Neolithic Wales?
How did people live in the Neolithic; what did they eat, what kind of shelter did they live in?
How did they bury their dead?
What tools did they use?
Did they have art?

The Group VII Stone Axe Source

What were stone axes?
How do we know where they came from?
Where is the Group VII stone axe source?
What can you see on the ground?
Where did stone axes go from this source area?

The Site

Where was the site? Find the grid reference and describe the location.
Why was the site investigated?
How was the site investigated?

The Results

What was found? Produce a plan of the site with the contexts labelled; write a description of the contexts found.
Describe the objects found and what they tell us about the site?
Read the specialist report on the charred plant remains and summarise what was found and what the importance is?
What date is the site?

Guidance

General Background

Use **Resources 2 and 6** above for background information. Search on-line for information but be aware that most of the information will not be specifically about Wales.

Stone Axes Background

Use **Section 4** below and GAT reports on the area for information. This section of the report should give the reader a background as to why the excavation was undertaken and why the area is worth investigating. It should describe what can be found in the uplands above Penmaenmawr and Llanfairfechan and why this is important for understanding the Neolithic period.

How and why the site was excavated needs to be described (use **Resource 18**). The location of the excavation trench needs to be described with the grid reference and a description of the location, and what natural and human features it is near (use **Resource 19**). In Britain since the 1940s a system, known as the British National Grid, has been used on Ordnance Survey maps to allow anywhere in Britain to be pinpointed. The country has been divided into 100m by 100m squares identified by a letter code; North Wales is in square SH. Within these squares is a numbered grid. See https://www.bbc.co.uk/bitesize/guides/z6j6fg8/revision/4 for how to work out grid references on this numbered grid.

For the report the location of the excavation trench needs to be worked out. Use the map provided (**Resource 19**) and instructions at https://www.bbc.co.uk/bitesize/guides/z6j6fg8/revision/4 to work out a six figure grid reference for the trench. There is a square beside the map marked out with divisions that can be used to measure a location within a grid square.

Use the contours on the map to find out how high above sea level the trench is (see https://www.bbc.co.uk/bitesize/guides/z6j6fg8/revision/3 for information on contours).

Use the information on the map to describe the location of the trench. Is it in the uplands? How close to the top of the nearest hill is it? How far from the town is it? What is the hill called that the trench is on? There are crags on the hill, where is the trench in relation to the crags? How close is the trench to the quarry? There are archaeological sites shown on the map. What sites are near the trench?

The Results

A neat plan of the trench is needed for the report (see **Resource 20** for a note on archaeological planning). The field drawing provided (**Resource 21**) is a drawing done during the excavation. A real field drawing would be done on a waterproof plastic drawing sheet, with a pre-printed grid to aid drawing. The drawing provided has been produced in the same way but has been scanned so that it can be reproduced. You will see that it is covered with mud and drawn in pencil. This needs to be made into a neat version for the report.

To do this an archaeologist would scan the drawing and would place the scan in a computer drawing package, such as CorelDraw or Adobe Illustrator. They would use the program to trace over the drawing and add text as necessary. It is important to add a scale bar so that the original scale is shown whatever size the drawing is printed out at. The scan would then be removed or hidden in the computer file and the drawing would be printed out at the required scale, usually to fit on an A4 sheet. If you have access to a computer with a suitable drawing package try this method.

The traditional way to produce a finished plan is to trace the field drawing by hand. For this you need ink pens (ultra-fine Sharpies will do) and some tracing paper. Fix the field drawing onto a table with masking tape, so it doesn't move, and fix the tracing paper on top. Trace the drawing neatly and very neatly write on the context numbers and other information. Include a scale bar. You could then use a photocopier to reduce the inked drawing from A3 to A4 to include in the report.

Context sheets are an important way that archaeologists record information about the site (see **Resource 22**). The context sheets (**Resource 23**) give descriptions and interpretations of the layers found on this site. Use the context sheets to produce a description of what was found.

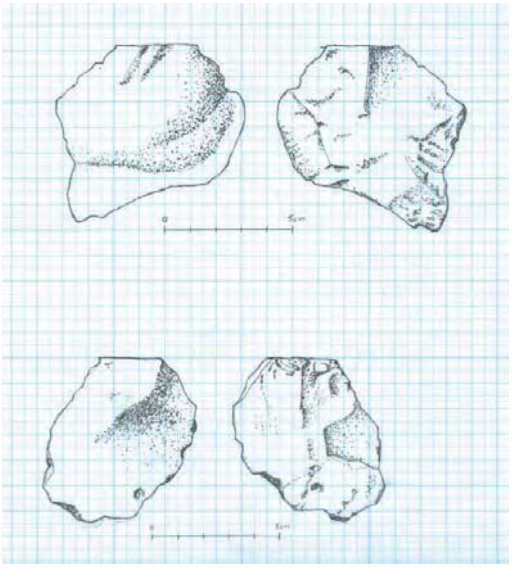
Finds

See **Resource 24** to find out about archaeological finds. The finds report (**Resource 25**) tells you about the finds that have been discovered from the excavation and which contexts they came from. Some of the finds have been drawn and described, but there are some flakes that need to be recorded. There are several actual stone flakes in bags. These are not actually Neolithic axe-working flakes, as these would be genuine archaeological artefacts that would need to be in a museum. Instead flakes of the same rock that were made while producing stone sets in the 19th century are used to represent axe-working flakes. These flakes show the same features as a real Neolithic flake would, but the stone is not quite as fine (see **Resource 24**).

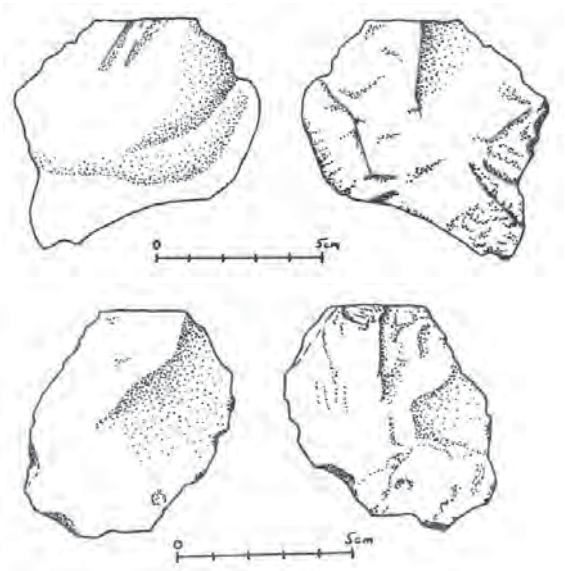
The stone flakes from each context need to be counted, measured (length, width and thickness) and a selection need to be drawn and others photographed (see **Resource 25** for recording table).

Finds drawings

Choose one of the stone flakes with the most distinctive surface features. Place it on a sheet of paper. With a pencil draw round it as close to the edge as possible. You need to get the shape and size as accurate as you can. Look at the surface of the flake. Undulations on the surface can show where other flakes have been taken off the same piece of stone. Draw any lines or cracks that you see. Use a ruler to measure in from the flake edge to features on the surface and measure to the same point on your outline so that you can draw the features accurately in the correct place. Use dots to create shading; the more dots the darker the shade. This can be used to show the curve of the



Examples of pencil drawings of flakes



The flake drawings inked up

flake. When you have drawn one side turn the flake over and draw the other side. Draw them side by side at the same angle so that they can be compared directly. Use your ruler to draw a 5cm scale beneath.

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Find photographs

Place the object on a white or neutral background. Make sure you have good light. An angle-poise light with the daylight bulb is ideal, but taking the photo in a window with natural light can work well. Artificial light may give odd colours to the photo. If the object can be set up so that the light is low and casts shadows across it then details in the surface of the object can be highlighted. Experiment with the object and the light source to get the best position.

Cut out one of the photo scales supplied, and place it next to the object. If this was done professionally a good quality digital camera would be used on a tripod, but try using any camera device available; phone, Ipad etc. Take the photograph from vertically above the object. You will have to keep very still if you don't have a tripod, but most devices should be able to give a reasonable result. Experiment with how far away you need to be from the object to get a sharp image.

Download the photographs. Choose the best ones and if possible crop them so that only the object and scale are included. If you have the software you could improve the image by increasing the contrast or adjusting the colour. Print out for inclusion in the report.

Charred plant remains

Archaeologists don't just collect artefacts but also natural materials that have been altered by people, such as wood that has been burnt in a fire (see **Resource 26**). A specialist report on the charred plant remains has been provided (**Resource 27**). The main report needs a summary of the charred plant remains found and a statement of their importance and what they tell us about the site.

Radiocarbon dating

Radiocarbon dating is an important way to find out the age of a site (see **Resource 28**). Use the Radiocarbon Dating Report (**Resource 29**) to find out the date of this site. Explore how the date of the hearth relates to the date of the other contexts. Which contexts might be contemporary with the hearth?

Radiocarbon dating is a complex technical process and the results are presented statistically. If you want to find out more about radiocarbon dating there are several explanations on the internet. Some recommended suggestions are at:- https://theprehistoricsocietyschool.files.wordpress.com/2020/03/ps-intros-methods-1-dating-methods.pdf https://www.radiocarbon.com/about-carbon-dating.htm

The problem of broad date ranges on radiocarbon dates is now partially being solved by using a statistical method called Bayesian analysis to compare dates and the make use of stratigraphic evidence to improve their precision. This is a complex statistical process, but Maths teachers that might be interested can see an over-view here:- http://www.palaeochron.org/bayesian.

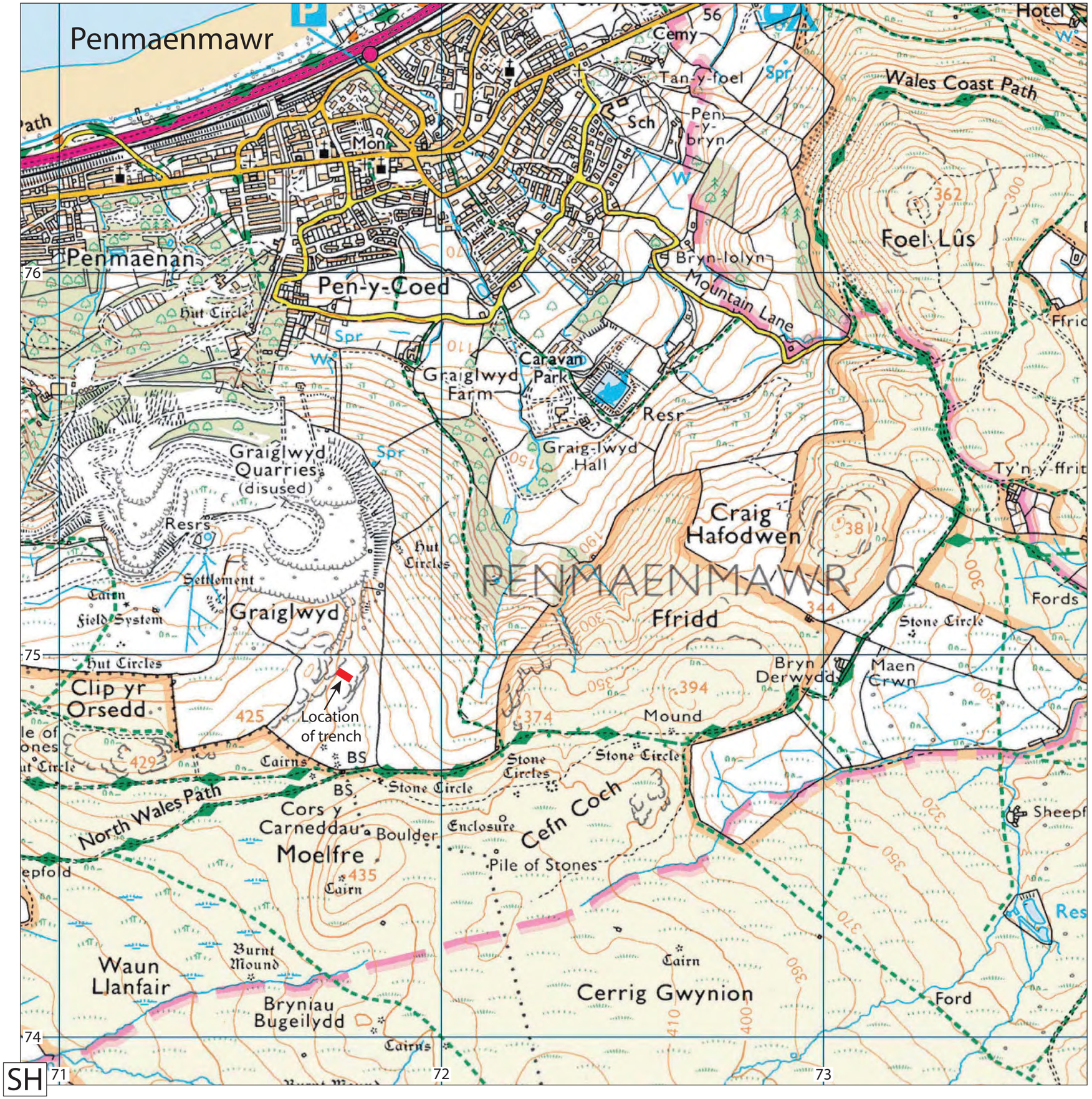
3.2. Resource 18: Excavation methodology

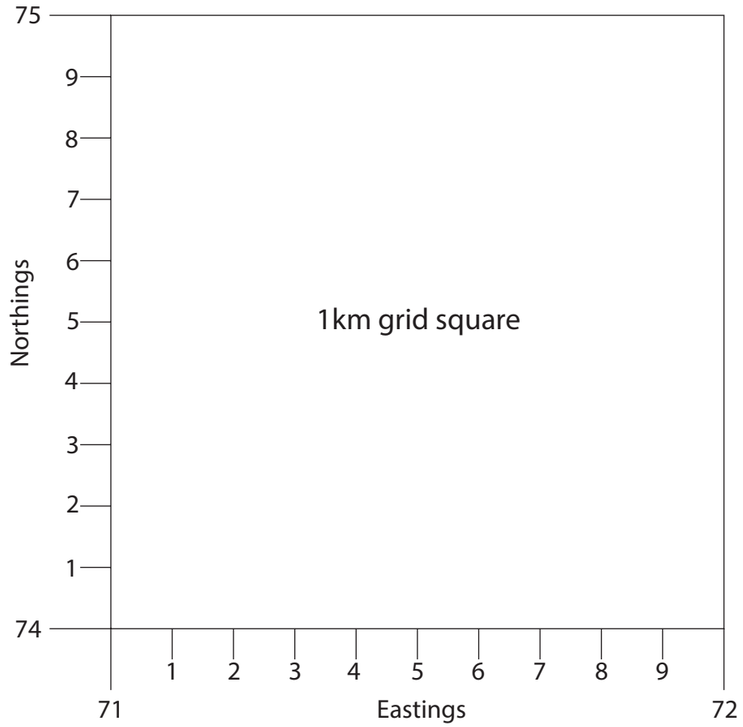
In July 2019 a trench was excavated to investigate stone axe making above Penmaenmawr. The trench measured 5m by 2m and was dug by volunteers under the supervision of staff from Gwynedd Archaeological Trust. The trench was dug by hand using spades, shovels and trowels. It was recorded by drawings, notes and photographs.

The work was done as part of the Carneddau Partnership Project with volunteers from Penmaenmawr and Llanfairfechan. The volunteers needed no previous experience at archaeological excavation but were taught the skills required by the supervising archaeologists, including how to record what was discovered.

The trench was located to investigate possible remains of axe working at the foot of a low crag on Graig Lwyd, Penmaenmawr. Previous work on the top and sides of the hill called Graig Lwyd has shown that stone was quarried and natural scree used for making stone axes. The low crag appears to have been quarried and it is possible that this was done in the Neolithic period. The expectation was to uncover axe-working debris to show that working did take place here. The ideal would be to find an undisturbed hearth from which material could be taken for radiocarbon dating. This would prove when the activity took place.

3.3. Resource 19: Map of excavation trench location





What is the grid reference for the excavation trench (marked in red)?

Where is the trench? Is it high up? What natural features is it near? How far is it from the town?

Can you spot Ysgol Pencae? (clue - the symbol for a school is **Sch**)

What archaeological sites can you see marked on the map?

Why would you not want to stand at SH 717 751?

What would be the easiest way to walk to the trench?

To find out what the map symbols mean go to:-
https://www.ordnancesurvey.co.uk/documents/25k-raster-legend.pdf
https://www.ordnancesurvey.co.uk/documents/resources/25k-raster-legend-welsh.pdf

Contours show heights 10m apart.

Map scale 1:10,000, based on 1:25,000 map

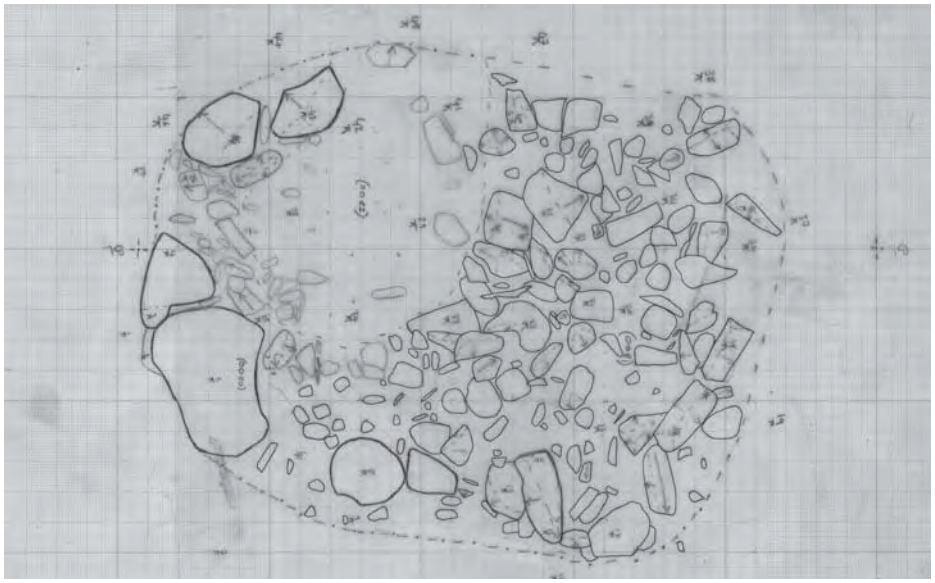
An archaeologist planning with a planning frame

Planning a Bronze Age grave using tapes

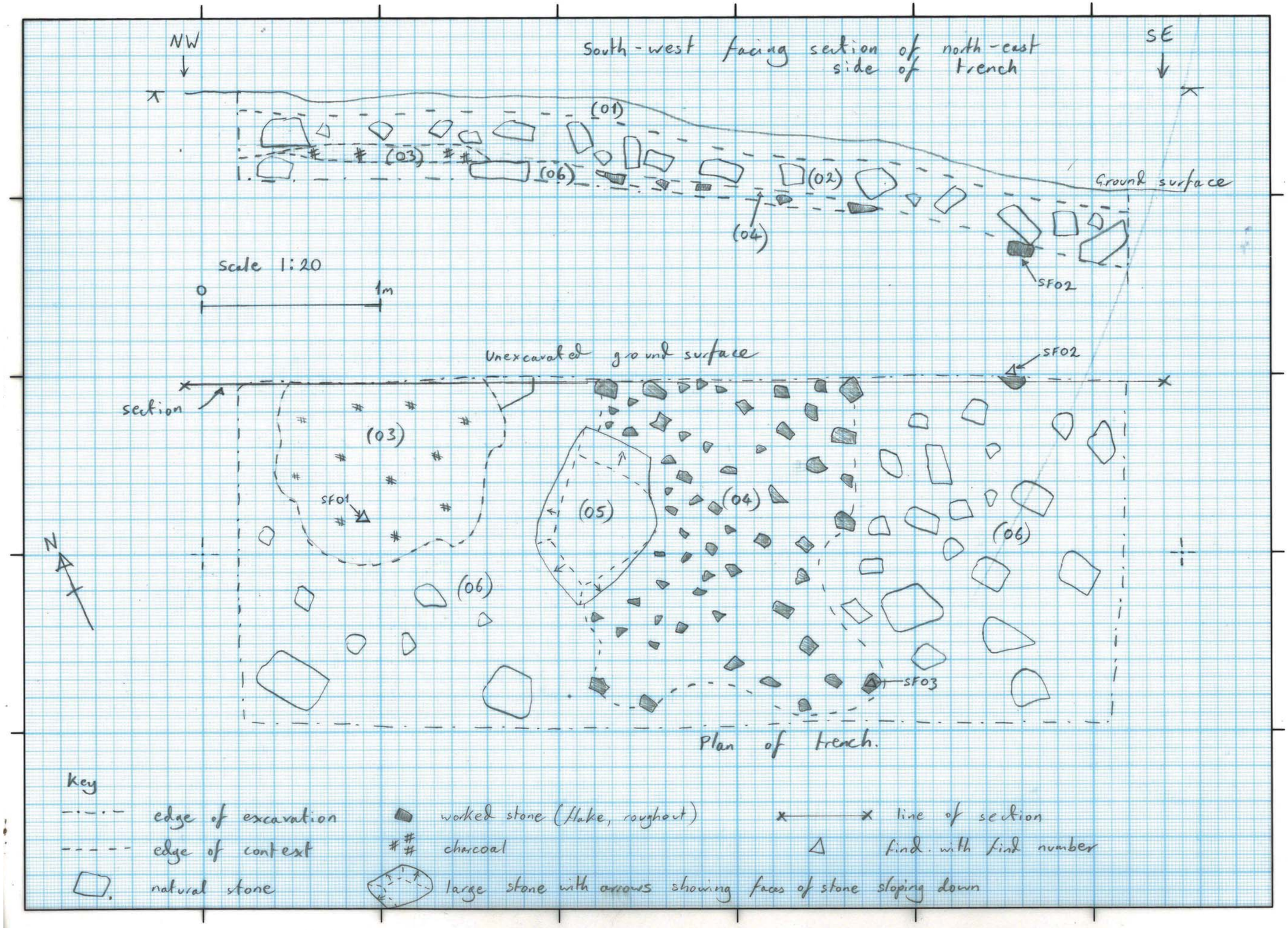
3.4. Resource 20: Archaeological Planning

Archaeologists draw what they find to record it in detail. They do drawings to scale so that it is easy to work out how large the original features were. A scale means that one centimetre on the plan is equal to a specific number of centimetres or metres on the ground. There are now several high tech methods of producing plans of archaeological features but archaeologists still often do drawings by hand because it allows for interpretation of what is being drawn.

Often a drawing is done by laying a 1m square frame (a planning frame) on the ground. This is divided into 20cm squares by string and can be used to copy the archaeology, such as stones of a wall, on to gridded drawing film.



An archaeological plan



PROJECT No. 92495

PROJECT / SITE NAME: Graig Lwyd
SUB AREA: Trench 01
SCALE: 1:20
CO-ORDS (SW - NE):
LEVELS:
DRAWN BY: JK
DATE: 01/04/2020
DRWG No.: 1
SHEET No.: 1
ORIENTATION

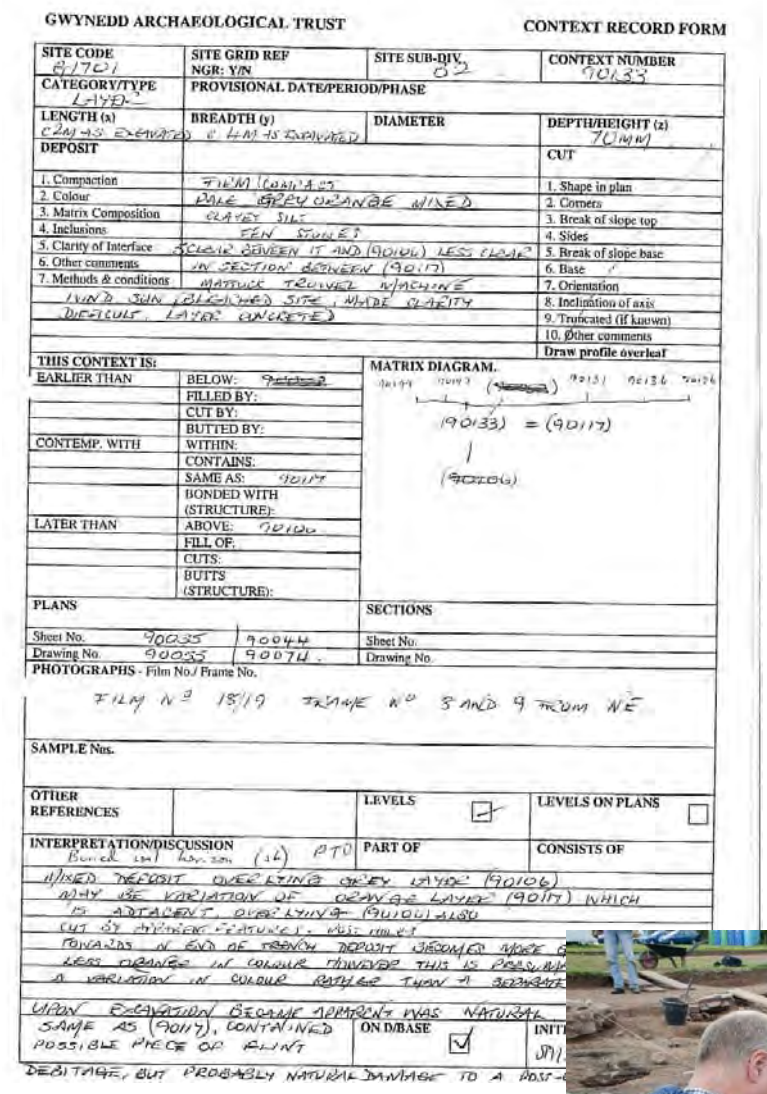
Plan and section of trench 01

Plan of trench measuring 5m x 2m. Section drawing of NE side of trench. Trench dug down to a maximum depth of 0.5m.

3.5. Resource 21: Field drawing of excavation trench

3.6. Resource 22: Archaeological contexts and context sheets

A dictionary definition of the word "context" is "the situation within which something exists or happens, and that can help explain it" (https://dictionary.cambridge.org/). Archaeologists use this sense of context in a specific way to describe elements of what they find during excavations. Every layer of soil, pit or ditch dug in the past is referred to by archaeologists as a "context". These are traces of events that have happened in the past and are the context in which objects are found. Archaeologists record each "context" separately and to do so they give each a number, so they can be identified on all the records. Information about each context is written on a context sheet, which also lists what plans and photographs the context appears on, what was found in it and what its relationship to other contexts was. It is important in archaeology to record which layer was above another. This gives the stratigraphy of the site. It shows the order in which things happened, which is important if you want to know what happened and when.



GWYNEDD ARCHAEOLOGICAL TRUST — CONTEXT RECORD FORM

SITE CODE	SITE GRID REF NGR: Y/N	SITE SUB-DIV.	CONTEXT NUMBER
8/1701		02	90133
CATEGORY/TYPE: LAYER	PROVISIONAL DATE/PERIOD/PHASE		
LENGTH (x): C2M+S EXCAVATED	BREADTH (y): C1M+S EXCAVATED	DIAMETER	DEPTH/HEIGHT (z): 70MM

DEPOSIT: FIRM (COMPACT); PALE GREY ORANGE MIXED; GRAVEL SILT; FEW STONES; SLIGHT BETWEEN IT AND (90106) LESS CLEAR; IN SECTION BETWEEN (90117); MATTOCK TROWEL M/MACHINE; MIND JOIN (BEGINNING SITE, MADE CLARITY DIFFICULT. LAYER CONCRETE)

CUT: 1. Shape in plan; 2. Corners; 3. Break of slope top; 4. Sides; 5. Break of slope base; 6. Base; 7. Orientation; 8. Inclination of axis; 9. Truncated (if known); 10. Other comments; Draw profile overleaf

THIS CONTEXT IS:

EARLIER THAN	BELOW: ~~90106~~	
	FILLED BY:	
	CUT BY:	
	BUTTED BY:	
CONTEMP. WITH	WITHIN:	
	CONTAINS:	
	SAME AS: 90117	
	BONDED WITH (STRUCTURE):	
LATER THAN	ABOVE: 90106	
	FILL OF:	
	CUTS:	
	BUTTS (STRUCTURE):	

MATRIX DIAGRAM: (90133) = (90117); (90106)

PLANS / SECTIONS

Sheet No.	90035	90044	Sheet No.
Drawing No.	90035	90074	Drawing No.

PHOTOGRAPHS - Film No./ Frame No.: FILM N° 18/19 FRAME N° 3 AND 4 FROM NE

SAMPLE Nos.

OTHER REFERENCES | LEVELS ☑ | LEVELS ON PLANS ☐

INTERPRETATION/DISCUSSION: Buried soil horizon (12) PTO

PART OF | CONSISTS OF

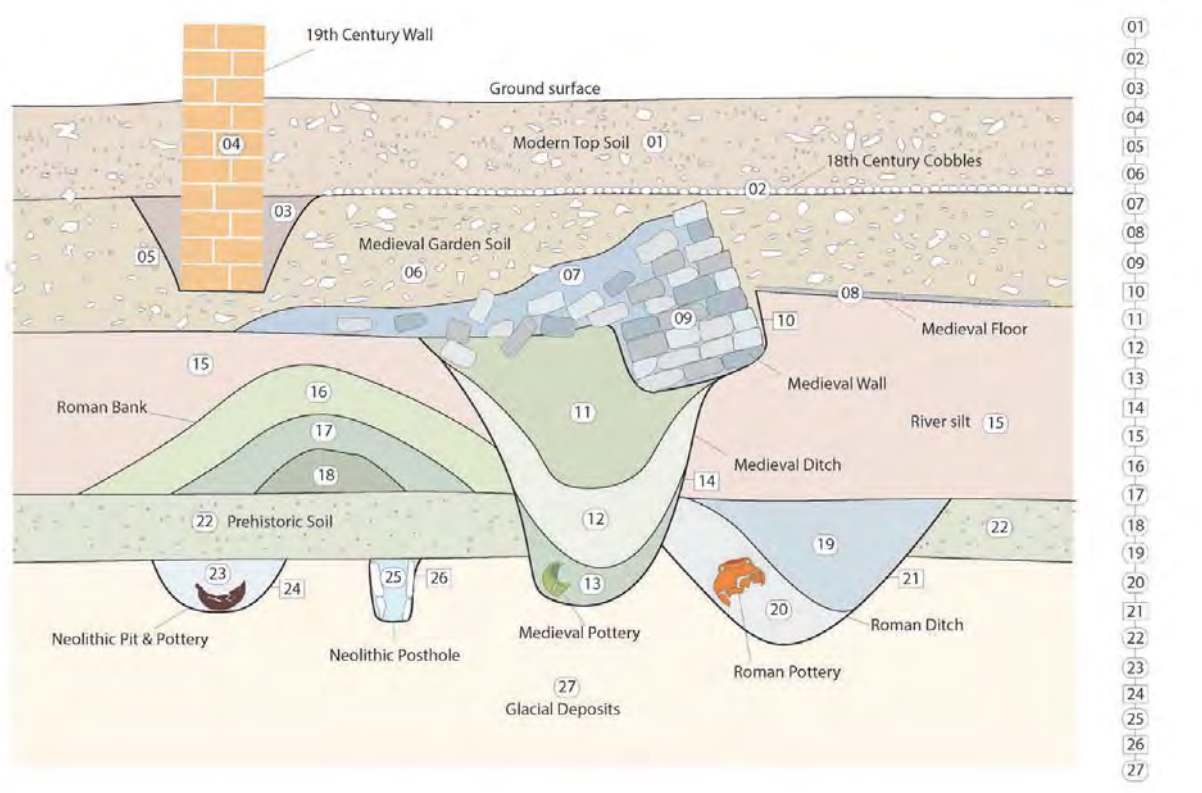
MIXED DEPOSIT OVERLYING GREY LAYER (90106) MAY BE VARIATION OF ORANGE LAYER (90117) WHICH IS ADJACENT, OVERLYING (90106) ALSO CUT BY MODERN FEATURES. MOST LIKELY FORMING END OF TRENCH. DEPOSIT BECOMES MORE G... LESS ORANGE IN COLOUR THOUGH THIS IS POSSIBLY A VARIATION IN COLOUR RATHER THAN A SEGMENT

UPON EXCAVATION BECAME APPARENT WAS NATURAL SAME AS (90117), CONTAINED POSSIBLE PIECE OF FLINT DEBITAGE, BUT PROBABLY NATURAL DAMAGE TO A POST-...

ON D/BASE ☑ | INIT... SM

A context sheet from a professional excavation

A professional archaeologist writing a context sheet



Example archaeological section showing stratigraphy; this is a vertical view through the layers of a site. The numbers shown are context numbers (deposits in ovals and dug features in squares). To the right is a diagram showing the order in which the deposits built-up and events happened.

Which contexts are Roman in date? Which are medieval?

Notice that all the pottery was found at about the same level below the ground surface, even though there are thousands of years between when the pots were made. Can you see why this has happened?

3.7. Resource 23: Context sheets

CONTEXT RECORD FORM

SITE CODE **G2495**			CONTEXT NUMBER **01**
CATEGORY/TYPE Layer	**PROVISIONAL DATE** Modern		
LENGTH >5m	**BREADTH** >2m	**DIAMETER**	**DEPTH/HEIGHT** 0.1m
DESCRIPTION			
A layer of dark brown soil with a few small stones. Grass growing on top. This layer is up 0.1m deep. This layer covers the whole trench.			

	This	01	context	
		02		

Relationships to other contexts

PLANS	**SECTIONS**
Sheet No.	Sheet No. 01
Drawing No.	Drawing No. 02
PHOTOGRAPHS - Film No./ Frame No.	
SAMPLES No samples taken	**FINDS** No finds
INTERPRETATION/DISCUSSION	
Turf growing in topsoil. The ground surface across the trench.	

CONTEXT RECORD FORM

SITE CODE **G2495**			CONTEXT NUMBER **02**
CATEGORY/TYPE Layer	**PROVISIONAL DATE** 19th century		
LENGTH >5m	**BREADTH** >2m	**DIAMETER**	**DEPTH/HEIGHT** 0.2m

DESCRIPTION

A layer mostly made up of stones. The stones are of all different sizes up to 0.5m long and are mostly sharp edges as if broken, but with some more rounded ones. Some of the stones are a dark colour showing that the breaks are fresh (that is hundreds rather than thousands of years old). The stones lie at all angles, higgledy-piggledy. This layer is up 0.2m deep. This layer covers the whole trench.

Above [ ] [01] [ ]

This [02] context

Below [ ] [03] [04]

Relationships to other contexts

PLANS	**SECTIONS**
Sheet No.	Sheet No. 01
Drawing No.	Drawing No. 02

PHOTOGRAPHS - Film No./ Frame No.

SAMPLES No samples taken	**FINDS** Late 19th century beer bottle

INTERPRETATION/DISCUSSION

Layer produced by fairly recent disturbance causing earlier layers to be mixed up and also includes some recently quarried pieces of stone. Probably the result of gathering stone for field walls and some quarrying of stone from the base of the crag. The beer bottle suggests that this was done in the late 19th century.

CONTEXT RECORD FORM

SITE CODE **G2495**			CONTEXT NUMBER **03**
CATEGORY/TYPE Layer	**PROVISIONAL DATE** Prehistoric		
LENGTH 1.3m	**BREADTH** 1.0m	**DIAMETER**	**DEPTH/HEIGHT** 0.1m

DESCRIPTION

A patch of dark soil with lots of pieces of charcoal within it. The stones immediately below this were slightly reddish in colour and cracked into pieces, showing that there had been a fire on top of them. This covered a roughly circular area measuring about 1.3m by 1.0m and was 0.1m thick. It was covered by context 02 and lay on top of context 06.

Above		02	
	This	03	context
Below		06	

Relationships to other contexts

PLANS	**SECTIONS**
Sheet No. 01	Sheet No. 01
Drawing No. 01	Drawing No. 02

PHOTOGRAPHS - Film No./ Frame No.

SAMPLES	**FINDS**
Samples taken for charred plant remains and radiocarbon dating	Flint flake

INTERPRETATION/DISCUSSION

This layer is the remains of a fire lit on top of the stones (context 06). The charcoal is from wood used as fuel and the cracking of the stones underneath is due to the heat of the fire. The flint flake found in this layer suggests that this fire was lit sometime in the prehistoric period.

CONTEXT RECORD FORM

SITE CODE **G2495**			CONTEXT NUMBER **04**
CATEGORY/TYPE Layer	**PROVISIONAL DATE** Neolithic		
LENGTH 1.9m	**BREADTH** 1.6m	**DIAMETER**	**DEPTH/HEIGHT** 0.1m

DESCRIPTION

A layer of fairly small stones up to 0.2m long. These covered an area measuring roughly 1.9m by 1.6m, which formed a rough horseshoe shape. All the stones were thin and had sharp edges. They were laid flat. There were a few similar stones found beyond the limits of the layer.

Above [ ] 02 [ ]

This 04 context

Below [ ] 06 [ ]

Relationships to other contexts

PLANS	**SECTIONS**
Sheet No. 01	Sheet No. 01
Drawing No. 01	Drawing No. 02

PHOTOGRAPHS - Film No./ Frame No.

SAMPLES No samples taken	**FINDS** axe-making flakes

INTERPRETATION/DISCUSSION

This spread of flakes shows where someone was making roughouts for stone axes. The flakes are scattered around where the person was working and have remained where they fell. The arc of the scatter would have been in front of the axe maker as they would have dropped while they were working. The axe-making shows that this deposit is Neolithic in date.

CONTEXT RECORD FORM

SITE CODE **G2495**			CONTEXT NUMBER **05**
CATEGORY/TYPE Structure	**PROVISIONAL DATE** Neolithic?		
LENGTH 1.0m	**BREADTH** 0.7m	**DIAMETER**	**DEPTH/HEIGHT** 0.4m

DESCRIPTION

A large stone with a flat top was found next to the hearth (context 03) and resting on the stones (context 06). The stone measured 1.0m by 0.7m and was 0.4m thick. The stone was placed so that its top was nearly horizontal.

Above [ ] 02 [ ]

This 05 context

Below [ ] 06 [ ]

Relationships to other contexts

PLANS	**SECTIONS**
Sheet No. 01	Sheet No.
Drawing No. 01	Drawing No.

PHOTOGRAPHS - Film No./ Frame No.

SAMPLES No samples taken	**FINDS** Stone, possible seat

INTERPRETATION/DISCUSSION

This stone seems to have been placed for someone to sit on. Its position next to the fire and within the arc of the scatter of flakes suggests that the person that had been making axe roughouts sat on this stone.

CONTEXT RECORD FORM

SITE CODE **G2495**			CONTEXT NUMBER **06**
CATEGORY/TYPE Layer	**PROVISIONAL DATE** Natural		
LENGTH >5m	**BREADTH** >2m	**DIAMETER**	**DEPTH/HEIGHT** unknown

DESCRIPTION

A layer of stones, some large (up to 0.5m long). They lie at various angles and some are quite rounded, though many have sharp edges. This layer covered the whole trench and only the top of the layer was exposed, so we don't know how deep it is.

Above	03	04	05
	This	06	context
Below		?	

Relationships to other contexts

PLANS	**SECTIONS**
Sheet No. 01	Sheet No. 01
Drawing No. 01	Drawing No. 02

PHOTOGRAPHS - Film No./ Frame No.

SAMPLES No samples taken	**FINDS** axe-making flakes

INTERPRETATION/DISCUSSION

The more rounded shapes of these stones suggest that this is natural scree, but the presence of some flakes suggests that this has been used for making stone axes. The scree may have been disturbed and there could be other axe-working layers underneath. Excavation stopped at this layer as there was not enough time to dig and record further axe-working layers properly, so it was best to leave it in place.

3.8. Resource 24: Finds

What are Finds?

When archaeologists talk about "finds" they mean old objects that they have discovered through excavation or other means. Finds are often things that people have thrown away, and they are often broken, but by comparing many of finds and where they come from it is possible to get a lot of information from even a small broken piece of pottery or chip of stone.

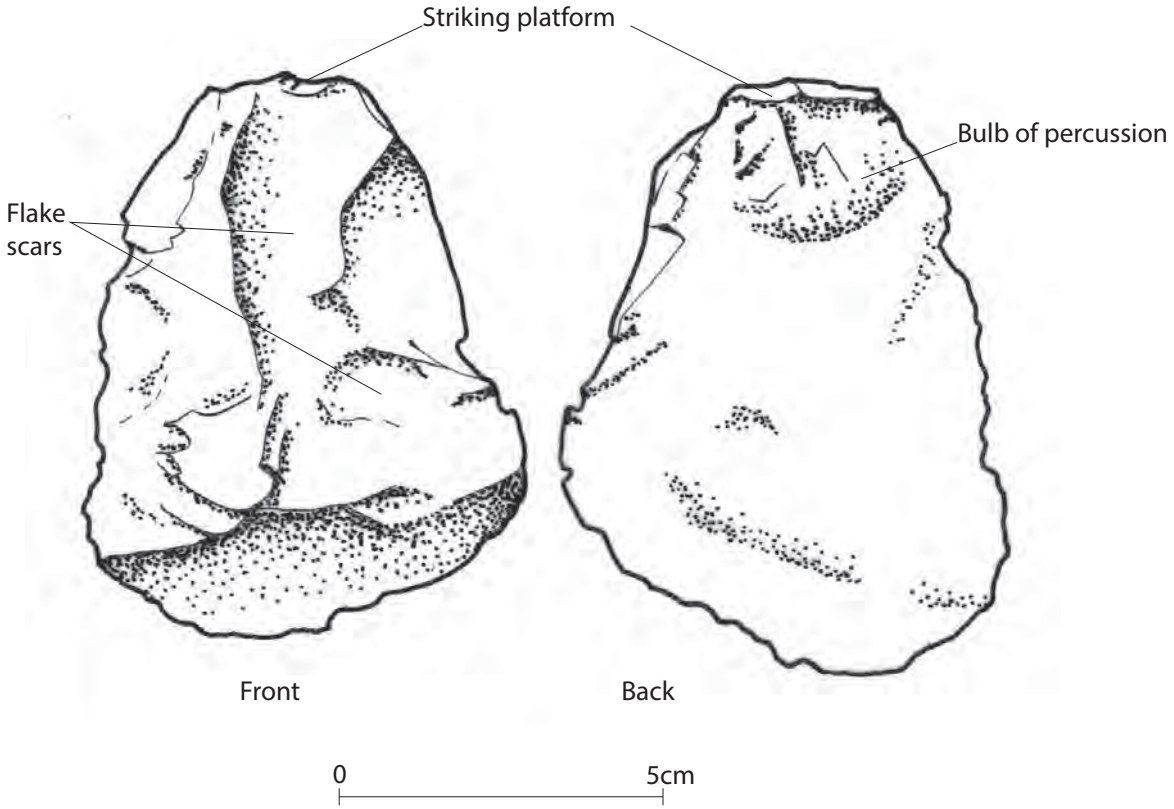
Finds of very different sorts found at a site at Llangefni, Anglesey (Flint scraper, American silver dime made into a pendant, medieval seal matrix (stamp to mark wax to seal a document) (front and back shown), Roman coin (front and back shown), handle of a hone stone (sharpening stone) for a cut-throat razor dated 1914, medieval lead spindle whorl for spinning (seen from 3 sides), a badge of the Teddy Tail League (mid 20th century), Roman brooch (seen form several angles and heavily corroded)).

An archaeologist carefully lifting a pot from a grave after it has been drawn and photographed in place

Flakes

Flint or other fine grained stones, such as the volcanic stone above Penmaenmawr, can be shaped by striking off flakes of stone. This is known as knapping and is done by hitting the stone with another stone or piece of antler in a very skilled way. An experienced knapper can break off flakes exactly as they want and precisely shape an object or produce sharp flakes that can be used as cutting or scraping tools. Stone axeheads were shaped in this way from rough pieces of natural scree or quarried stone.

How do you know if this is a flake made by a person or just a piece of stone? Because the stone knapper strikes the stone in a specific way to produce a flake that flake has certain features. One of the edges is usually flat. This is the "**striking platform**", which is where the stone was struck to strike off the flake. The force of the blow causes the stone to break in a way that looks a bit like a shell with a rounded lump, called the "**bulb of percussion**" near the striking platform, and ripples running out from it. On the other side of the flake there may be scars of other flakes that were struck off the piece of stone before this flake was removed. These are known as "**flake scars**".



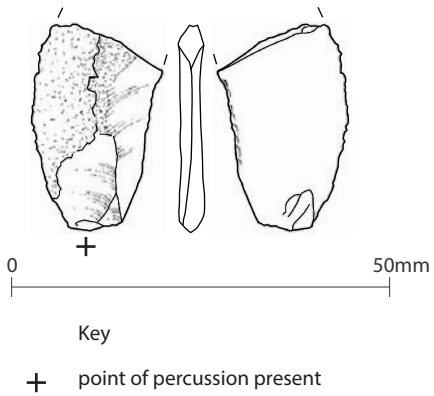
3.9. Resource 25: Finds Report

Most of the finds recovered from the site were of stone, but there was one glass object.

Credit: National Trust

A glass beer bottle was found in **context 02**. This is a green glass beer bottle, with a round squat body, narrow neck and bulbous lip. It is marked with 'SWANSEA OLD BREWERY, CARDIGAN'. The Swansea Brewery was established in 1835, at Singleton Street, Swansea, West Glamorgan. In 1896 it was combined with the Davies Brothers Brewery to form the Swansea Old Brewery Ltd & Davies (Cardigan) Bonded Stores Ltd, changing its name to Swansea Old Brewery Ltd in 1921. The beer bottle probably belongs to the late 19th century.

A flint flake was recovered from **context 03**. This measures 27mm long and 16mm wide and is 3mm thick. It has been broken at one end and was originally longer. The flint was collected from a beach and knapped to produce a flake probably for cutting. Such a flake could have been used in any prehistoric period.



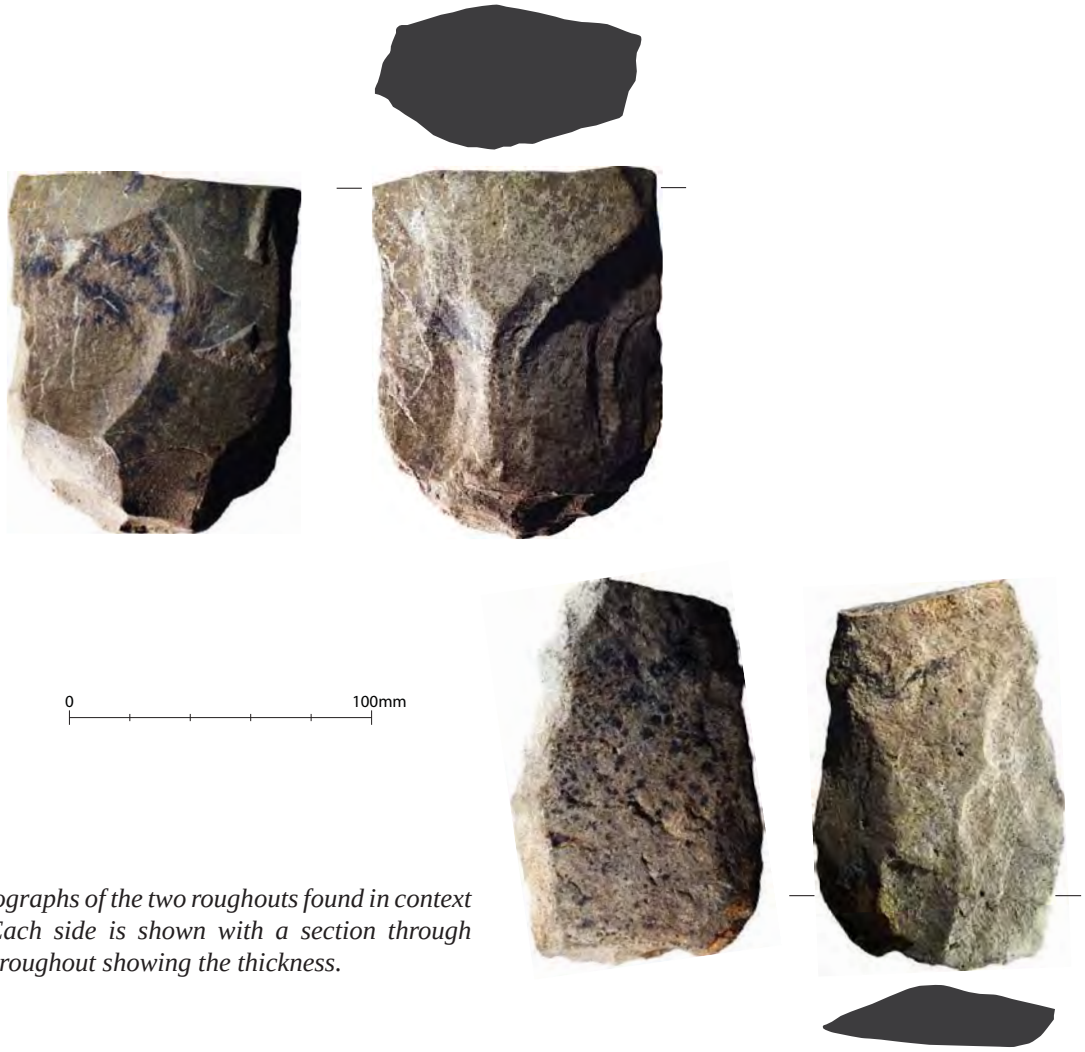
Flint flake

Context 04 produced stone flakes. Almost all the stones in this layer were flakes knocked off larger stones. Some were very small and thin. These are flakes from making a roughout for a stone axe. The smallest flakes are from the final shaping of the axe roughout.

The flakes need to be counted and measured. Use the table below.

Flake number	Length	Breadth	Thickness

There were also two blocky stones with traces where flakes have been removed from them. These had been broken and only half of each was found in the trench. These are roughouts that broke fairly early in the process and were thrown away.



Photographs of the two roughouts found in context 04. Each side is shown with a section through each roughout showing the thickness.

Context 05 is also a find. It is a large stone with a flat top measuring 1.0m by 0.7m and 0.4m thick. Although the stone showed no signs that it had been shaped by people, it seems to have been carefully placed and almost certainly was deliberately put in place by people. It can therefore be considered a find. It seems to have been used as a seat while knapping a stone axehead.

Context 06 produced a small number of axe-making flakes. Most of the stone in this context was natural scree, so the flakes might have got mixed in from above.

3.10. Resource 26: Charred Plant Remains

What is charring?

In certain conditions in a fire, when there isn't much oxygen, a plant or a piece of wood might not be completely burnt, but just charred. This means it is turned to pure carbon. When you get charcoal for a barbeque it is made from wood that has been burnt with not enough oxygen so it becomes charcoal. Most plant material rots in the soil but if it has been charred the remains can last for thousands of years.

Charred cereal grains
Credit: Canterbury Archaeological Trust

How do you recover charred plant remains?

During an excavation samples of soil are taken from important layers. These are put into plastic tubs or bags and are taken to a flotation unit. The flotation unit is a tank with water running through it, over which sieves and very fine mesh are suspended so that the soil sample can be washed through. Charred plant remains float off and are caught in the mesh and larger particles are caught in the sieves. This is also a good way to find very small objects, such as tiny bits of flint from flint knapping. The charred plant remains are then dried and put into bags or bottles to send to the specialist.

Processing soil samples through a flotation tank

What does the specialist do?

The specialist looks at the samples of charred plant remains and counts and identifies different bits of the plants. These might be pieces of charcoal, charred seeds of weeds or cereals, bits of heather twig or other material. The specialist uses a microscope to look at the bits of plants very closely and compares them to a reference collection of charred and uncharred remains so that they can identify what part of the plant the piece is and what species of plant it is from.

What does this tell us?

This tells us what plants and trees have been used on the site and what they were used for. It can show us what crops were being grown, with weeds seeds sometimes giving an idea of what time of year certain crops were planted. It can show us what wild foods were being collected, such as hazelnuts and apples. Charcoal can show what trees were used for firewood or for building and shows what trees were growing in the area so we can find out about the wider environment.

3.11. Resource 27: Charred Plant Remains Report

Charcoal and charred plant remains from excavation trench at Graig Lwyd, Penmaenmawr
By Rosamund McKenney, palaeoenvironmental specialist

Methodology
A sample of 40 litres of soil was taken from the hearth deposit (context 03). This was processed using flotation to recover the charcoal and charred plant remains. These were studied under the microscope to identify the species.

Results

Charcoal
Table of charcoal from the sample

Species	Count of items	Percentage
Oak	357	31.78
Hazel	125	11.19
Willow	57	5.10
Alder	64	5.73
Unidentified	516	46.20
Total	**1117**	**100**

The table shows that over 46% of the items inspected were not well enough preserved to be identifiable, but of the identifiable items most were of oak. These were all pieces of small branches or twigs. The other 22% of the charcoal was made up of hazel, willow and alder, which were also all from small branches or twigs.

It is likely that the charcoal is from wood collected as fuel for the fire. This shows that oak, hazel, willow and alder were all present fairly close by. Willow and alder grow in wet environments, so it suggests that a marshy area nearby was being used as a source of firewood. The oak and hazel probably represent woodland on dryer land in the area. This suggests that the land was not open moorland as today but was wooded, though the woodland was probably quite open and scrubby in the area of the trench given its altitude.

Charred plant remains
Few other charred plant remains were found but there was a small amount of cereal chaff and three charred cereal grains. Two of these grains could not be identified to species but the third was emmer wheat. This is an early variety of wheat that was commonly grown in the Neolithic period. The chaff was also consistent with being from emmer wheat.

The chaff suggests that waste from cleaning grain was used to start the fire. This is a very important discovery as it suggests that wheat may have been winnowed to clean it nearby. This probably would not have been done far from a village, though in more recent times people did go to the top of hills to get a good draught for winnowing. If people were living up and the hills it is likely that the grain was also grown in small fields nearby. While the land now is cold, wet and exposed in the Neolithic period the climate was slightly warmer and the trees would have provided protection and would have meant that the ground was not waterlogged. It is not impossible that grain may have been grown at this height.

Conclusion
The charcoal has shown that there was woodland in the area. The presence of cereal grains and chaff is very important and suggests that people may have lived and grown wheat in the area. This is something that should be investigated in future by pollen analysis of peat bogs in the area and by further excavation and sampling.

3.12. Resource 28: Radiocarbon Dating

What is radiocarbon dating?

Archaeologists need to know when something happened, so it was a major advance when radiocarbon dating was invented in the 1950s, allowing artefacts to be dated directly. Radiocarbon dating works because small amounts of radioactive carbon are produced in the upper atmosphere. This is taken in by plants and animals while they are alive, but once they die the radioactivity decays. The amount of radioactive carbon in a sample can be measured and that shows how old the sample is; the less radioactive carbon, the older the sample.

What can be dated?

This dating method relies on carbon found in living or once living things, so only something that was once alive can be dated by this method. A bone or a piece of charcoal can be dated but not a flint tool. It is important to ask what you want to date. A big tree might be 400 years old before it is felled. If you want to date when the tree was cut down and used in a building you need to date the outside of the tree (which grew just before it was cut down), not the middle of the tree, which grew when the tree was young. Charcoal survives very well in soil but it can get mixed up into different layers, so a date on the charcoal may not date the layer that it is in. One of the best places to get samples for dating from is in a hearth where charcoal from small branches or twigs that have been used as fuel will give a date for the fire.

How is material dated?

Samples that have been identified to species by a specialist, such as charred twigs of hazel or charred cereal grains are sent to a dating laboratory. It is now possible to date very small items such as a single grain. The laboratory processes the sample and places it in a big machine called an Accelerator Mass Spectrometer which measures the amount of radioactive carbon in the sample. From this they work out the date of the sample.

Accelerator mass spectrometer at the dating lab at East Kilbride, near Glasgow (credit: Scottish Universities Environmental Research Centre (SUERC)

What does a radiocarbon date look like?

A radiocarbon date is not like a historical date. It is a measurement of an amount of radioactivity, and this cannot be converted into a simple single date, but has to be presented as a date range. The actual date of the sample will fall somewhere within that range. For a Neolithic sample the date range is often about 100 years, but when you are trying to find out what happened 6000 years ago that's not too bad.

3.13. Resource 29: Radiocarbon Dating Report

Radiocarbon dates from excavation trench at Graig Lwyd, Penmaenmawr
By David Hometown, Scottish Universities Environmental Research Centre, Radiocarbon Laboratory

Methodology
Two items were submitted for radiocarbon dating from the hearth (context 03). These were a charred cereal grain identified as emmer wheat and a small twig of hazel. These were analysed using an Accelerator Mass Spectrometer.

Results

Sample 1: charred cereal grain (emmer wheat)
Date: 3750-3680 BC

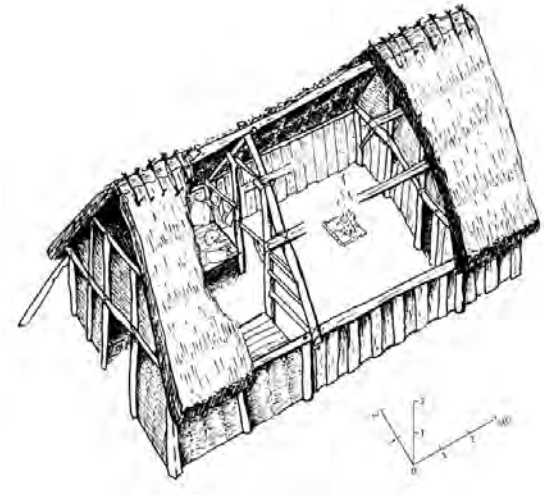
Sample 2: charred twig (hazel)
Date: 3720-3650 BC

Conclusion
These two dates overlap significantly and could be from the same event. These samples are closely associated with the fire found in the trench and can be assumed to date when that fire occurred. They place the fire and activity associated with it close to the start of the Neolithic in North Wales.

4. LANDSCAPE OF NEOLITHIC AXES

4.1. Neolithic stone axes

The Neolithic period (about 4000 BC to 2500 BC) is when farming was first introduced to Britain, along with new technologies such as pottery. Towards the start of this period large timber buildings were built and towards the end huge monuments defined by timber posts were constructed. Axes were necessary to make these, as well as to clear forest for agriculture, but this was before metalworking, so stone had to be used to make axeheads. Flint was used because it can be knapped (carefully flaked in a controlled manner) to shape an axehead, but flint is rather brittle. Even better is a hard stone that is not brittle but has a fine enough grain to be knapped like flint. Across Britain there were only a small number of places where suitable stone could be found and axeheads made from these stone sources were distributed elsewhere.



Reconstruction drawing of an Early Neolithic building found at Llandygai near Bangor

Stone axeheads were probably distributed as part of gift exchange networks, rather than trade in a modern sense, with axes being given as gifts to increase the status of the giver or create social obligations. The distribution of axeheads, therefore, indicates the extent of connection between people in the Neolithic period. In many cases axeheads have been found in ceremonial monuments, deposited in pits or ditches after having been deliberately broken. This suggests that they had a symbolic significance, as well as being practical tools, and were deposited as part of a ritual in a special place. As the axes had travelled a long way they were probably seen as special and rare. It is likely that stories associated with the production, exchange and ownership of each axe would be passed on with the axe itself, adding to their importance to people who owned them.

Neolithic polished stone axe found still in its wooden haft at Ehenside Tarn, Cumbria; now in the British Museum (copyright British Museum)

Neolithic stone axeheads were set in wooden, or occasionally antler, hafts, and axeheads still in their hafts are very occasionally found in waterlogged sites, were the wood survives. Large axes would have been swung like a modern felling axe to fell trees, but some axeheads were very small and could be used for fine work or may have been purely symbolic. The axeheads were often polished all over, which takes a long time. While polishing at the cutting edge and where the haft sits can improve the performance, there is no practical need to polish the whole axehead. However, polishing brings out the character of the stone and gives fine control over the shape of the object, suggesting that polishing was about style not function. Polishing emphasises the character of the stone, making it more identifiable, perhaps because the origin was of particular importance. Most stone sources used for axeheads were on or close to impressive crags or mountains, with stone sometimes quarried from spectacular locations when

Replica Neolithic stone axes being used to fell a tree

easier sources were available. This suggests that these locations were important and stories about the mystical mountain from which the stone was obtained may have circulated with the axes. Neolithic people were very familiar with stone and must have been able to identify stone from different sources, so a finely polished axehead would show that it was genuine.

Location of main axe quarry site at Great Langdale. Difficult to access and an impressive location (photo Steve Burrow)

4.2. The Geology of Llanfairfechan and Penmaenmawr

Llanfairfechan and Penmaenmawr sit on the narrow coastal plain with hills forming the northern end of the Carneddau Range behind them. The most prominent of these hills is Penmaenmawr Mountain, a shear craggy hill rising out of the sea. It used to be crowned by an Iron Age hillfort, known as Braich y Dinas. However, the hillfort and much of the top of the mountain have been quarried away and its slopes remodelled by screes of quarry waste. A length of the original crags and natural scree below them still survives on the western side of the mountain. Running east from Penmaenmawr Mountain is a ridge called Clip yr Orsedd at the eastern end of which is a rock outcrop known as Y Graig Lwyd, also partly quarried away. This had natural screes below it, some of which are buried under quarry waste but much survives largely over grown with heath vegetation.

Penmaenmawr Mountain, which would have been more promenant before quarrying.

Aerial photograph of Graig Lwyd Quarry taken in 1993 showing the outcrop of Y Graig Lwyd partly quarried away (photograph by G. I. Davies)

Map of Llanfairfechan and Penmaenmawr and the northern part of the Carneddau

Llanfairfechan is also overlooked by Dinas and Garreg Fawr. Dinas is surrounded by extensive screes and Garreg Fawr also has areas of scree, though much of this is under vegetation. To the east of Dinas is an upland plateau, known as Waun Llanfair, with the mountains of Tal y Fan and Foel Lwyd beyond. Waun Llanfair is now a wet, marshy and rather desolate place, but it is covered with Bronze Age and Iron Age monuments indicative of more intensive use in the past. Just beyond Waun Llanfair, above Penmaenmawr, is a group of Bronze Age monuments including the Druids' Circle or Maenau Hirion.

This area was of interest to the Neolithic people, and therefore of interest to us today, because of its geology. The bedrock under most of the area is siltstone, a sedimentary rock, but protruding through these deposits are intrusions of volcanic magma, which form Penmaenmawr Mountain, Dinas and Garreg Fawr. Technically these rocks are a Microdiorite, known as augite granophyre, but they are referred to locally as "Pen Granite". This rock is sufficiently fine grained to be coarsely knapped, allowing it to be shaped into setts used to pave the streets of

Dinas from Garreg Fawr with Clip yr Orsedd in the background

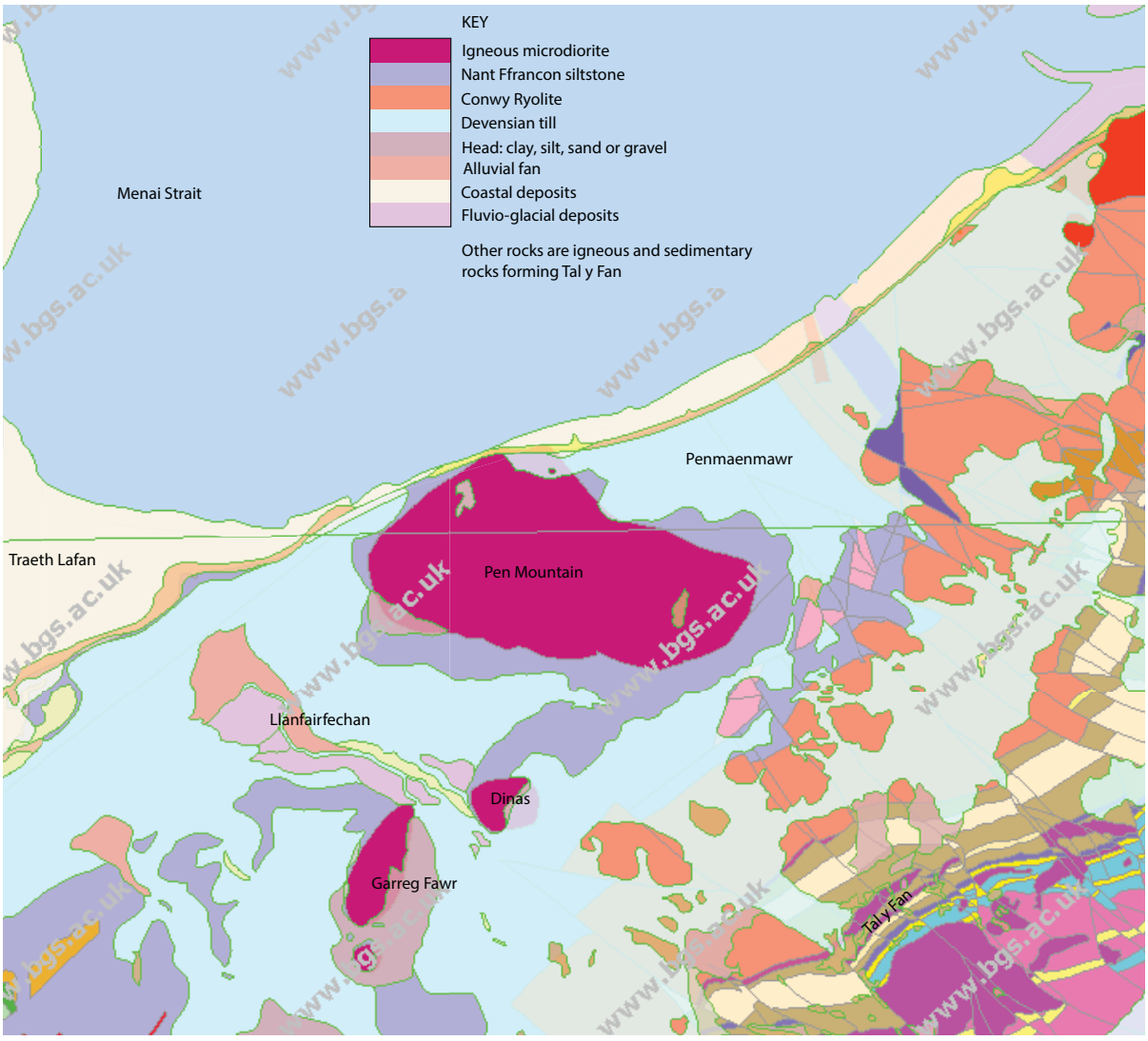
Garreg Fawr from Dinas

Liverpool and other cities. However, around the margins of the magma intrusions, where the molten rock cooled quickly, the stone is very fine grained, and is particularly suitable for stone axehead manufacture. The Graig Lwyd outcrop is made of this very fine grained stone but there is similar rock on Dinas, Garreg Fawr and round the western margin of Penmaenmawr Mountain.

4.3. The Graig Lwyd Axe Source

It has been known since 1919 that stone axeheads were produced near a rock outcrop known as Y Graig Lwyd, above Penmaenmawr (on the edge of the Graig Lwyd Quarry). The stone axeheads were first recognised by

The geology of the Llanfairfechan and Penmaenmawr area



Samuel Hazzeldine Warren, a geologist who holidayed in Penmaenmawr. Warren undertook several seasons of excavation and found about 3 tons of unfinished and broken axeheads, as well as immense amounts of waste. Warren showed that the natural screes below the crag were used as a source of stone for the axeheads. In the 1990s Gwynedd Archaeological Trust carried out detailed surveys of the surviving working area at Graig Lwyd and undertook some small scale excavations. One excavation exposed an area where stone had been quarried directly from the bedrock on top of the hill, so both quarried stone and scree was being used to make axeheads.

Samuel Hazzeldine Warren

A piece of scree was selected and tested by roughly knapping it. If it did not seem suitable it was thrown away. Some axeheads broke while they were being knapped and these were also thrown away. These unfinished pieces are known as "roughouts", and it was these that Warren found, as well as flakes of stone chipped off during knapping. He sent many of the best examples to museums around Britain.

Trench excavated in 1993 that revealed Neolithic quarrying with an axe roughout placed in the corner, photograph taken by John Llywelyn Williams in 1993

On Graig Lwyd there is also a natural rock face with its lower part broken and roughly quarried. Some of the quarrying seems to be relatively recent, but some appears ancient. That this quarrying might be Neolithic is supported by a large flake scar on the rock face. This scar has been made by a large flake of stone being struck from the rock. Ripple marks in the scar show that it was struck from below, possibly by a large stone maul swung upwards. It seems highly likely that traces of the quarrying process are buried at the

Quarried rock face on Graig Lwyd with flake scar being pointed out

foot of the rock face and that this would be a good place to investigate further.

The survey work indicated hollows, probably relating to axe-working, extending down the hill slope almost as far as Graig Lwyd Farm. This is confirmed by a sketch map created by Warren that marks the discovery of flakes all across this area. He describes finding “a great number of flakes a little above the farm buildings” at Graig Lwyd Farm and a broken axehead from the farm track. A roughout has been reported from a garden below Graig Lwyd Farm and it is likely that there was axe-working in the fields around and below the farmhouse.

4.4. An Axe-making Landscape

Warren realised that axehead roughouts could be found, not just at Graig Lwyd, but over a much wider area. Since then some archaeologists have recognised that the stone axe workings extended to Garreg Fawr and Dinas, but little professional archaeological work has been done to investigate the wider landscape. However, since the 1990s Mr David T Jones of Llanfairfechan has been collecting axehead roughouts and exploring axe-working sites around Llanfairfechan. His work has shown that there is a whole landscape of axe-working preserved in the area, not just a single site. This work forms the basis of the current project.

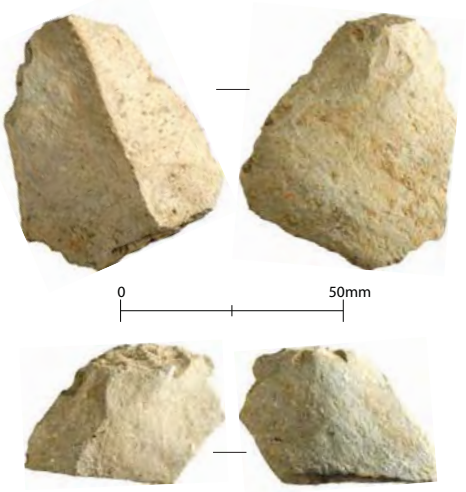
The lower screes at Dinas used for axe-making

A roughout as found at the foot of Dinas

Axe-working sites have been identified by Mr Jones on the northern side of Garreg Fawr, at the foot of Dinas and below the western face of Penmaenmawr Mountain. In all these cases natural scree was being used to provide stone for axeheads. Some roughouts and stone flakes have been found away from the rock sources, especially around Waun Llanfair, and it is assumed that some finer working of roughouts occurred in these areas. It is not yet known where the final polishing occurred. It may have been done nearby, using sand from one of the streams, or the roughouts could have been taken to settlements in the lowlands. We also don’t know where the people that were making the axeheads were living. These are things that we would like to find out.

Axe roughout found at the Dinas by David T Jones

Flakes from making axes found on Waun Llanfair



4.5. Distribution and Deposition

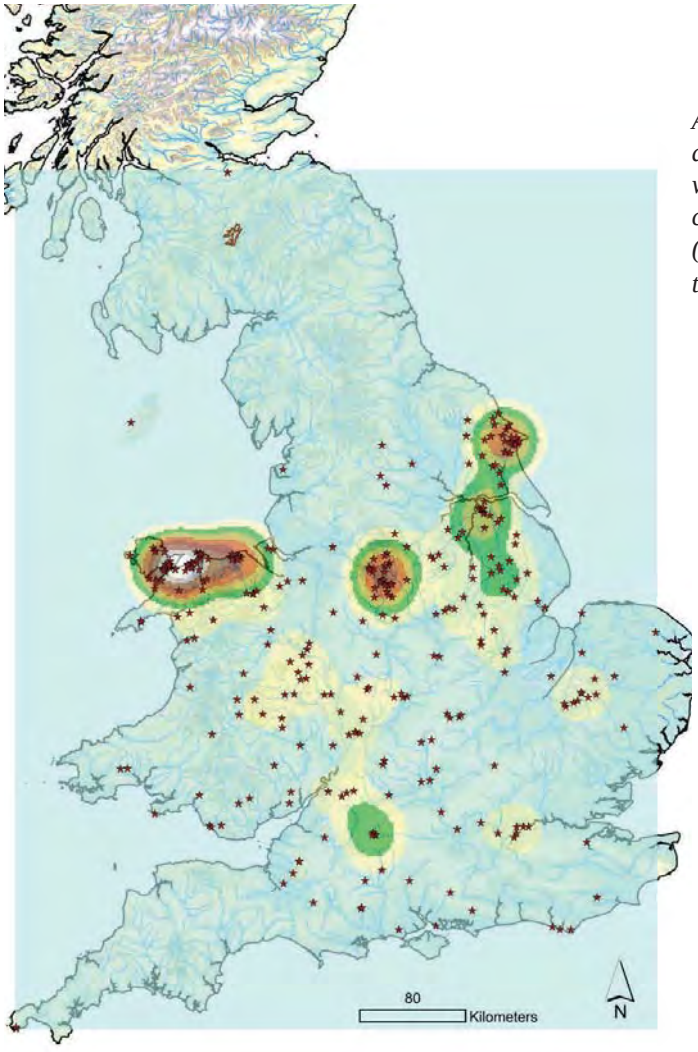
Axeheads from Penmaenmawr and Llanfairfechan were distributed across Britain in the Neolithic period. We know this because samples from stone axeheads from across Britain were studied microscopically to identify the types of minerals they contained. These samples were compared to known stone sources to identify where they came from. The largest number of axeheads was found to come from a source in the central Lake District, focussed around Great Langdale, but the next most widely distributed source was the stone from Penmaenmawr and Llanfairfechan. Axeheads from this source have been found over most of England and Wales. There is a distinct concentration of axeheads from Penmaenmawr and Llanfairfechan found in North Yorkshire, suggesting a particular contact with this region.

Like other axeheads they are often found buried in pits in monuments, such as causewayed camps (enclosed sites defined by ditches with many causeways across and used for large gatherings) or in henges (large circular monuments defined by a ditch inside a bank). Most axeheads from such sites have been broken or burnt before being buried to deliberately make them unusable. The axeheads can be associated with animal bones representing joints of meat or with pottery, or more rarely with human bones. These items were not just waste but carefully selected and placed objects that seem to have been offerings to the ancestors or gods.

Many axeheads have been found during ploughing or other groundwork. These are not necessarily associated with Neolithic settlement and seem to have been lost during use, perhaps in the forest while felling trees. However, many of these axeheads are not broken or damaged, and some seem to have been barely used. May be some of these were also offerings deposited in wilder places rather than in a monument.

4.6. Date

The Neolithic axe making at Penmaenmawr and Llanfairfechan is dated by the date of the contexts in which finished axeheads have been found. Some flakes from a polished axehead from this source were found in an Early Neolithic house at Llandygai, which dated to about 3700-3600 BC. Other axeheads from Late Neolithic henge monuments show that axes from this source were still being made in about 3000 BC and later. However, there are very few dates from the source areas themselves. It is possible that axeheads were made here right from the start of the Neolithic period, perhaps as early as 3900 BC, or even that the stone was used in the preceding Mesolithic period. Axeheads may also have been made well into the Bronze Age. Different stone sources across the landscape may have been used at different times. Contributing to understanding the date of the axe-making is an important



A plot of axeheads from the Graig Lwyd area found across England and Wales with statistical analysis highlighting concentrations of axeheads (courtesy of R A Williams, from his PhD thesis)

aim of the project but relies on finding hearths used by the axe-makers to provide material for radiocarbon dating.

4.7. Protection

The axe-working sites can be easily damaged and much archaeological information lost if they are disturbed. It is important not to dig or turn stones over in looking for axehead roughouts. We want to preserve this important landscape for future generations to explore. Most of the known axe-working sites are on private land so there is no public access.

However, if you find a roughout in your garden or loose on the ground surface it is very useful for this information to be recorded. It could indicate axe working in places not previously suspected. If you find an axehead roughout please send a photograph with details of where it was found to Sean Derby (sean.derby@heneb.co.uk) at the Gwynedd Historic Environment Record, so that he can record where it came from.

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