



TEACHERS' RESOURCE

A useful guide to help lead your group around the site.



STAYING SAFE ON SITE



Fire—Please familiarise yourself and your group with the fire exits and the emergency assembly points. In case of fire, please use the fire exit doors provided and gather your group at the nearest assembly point and wait for further instruction.

Weather—As half of your tour takes place outside, it is important that your group is prepared for all weather conditions. A jacket/warm layer is advised as the temperature underground ranges from 5°C —8°C.

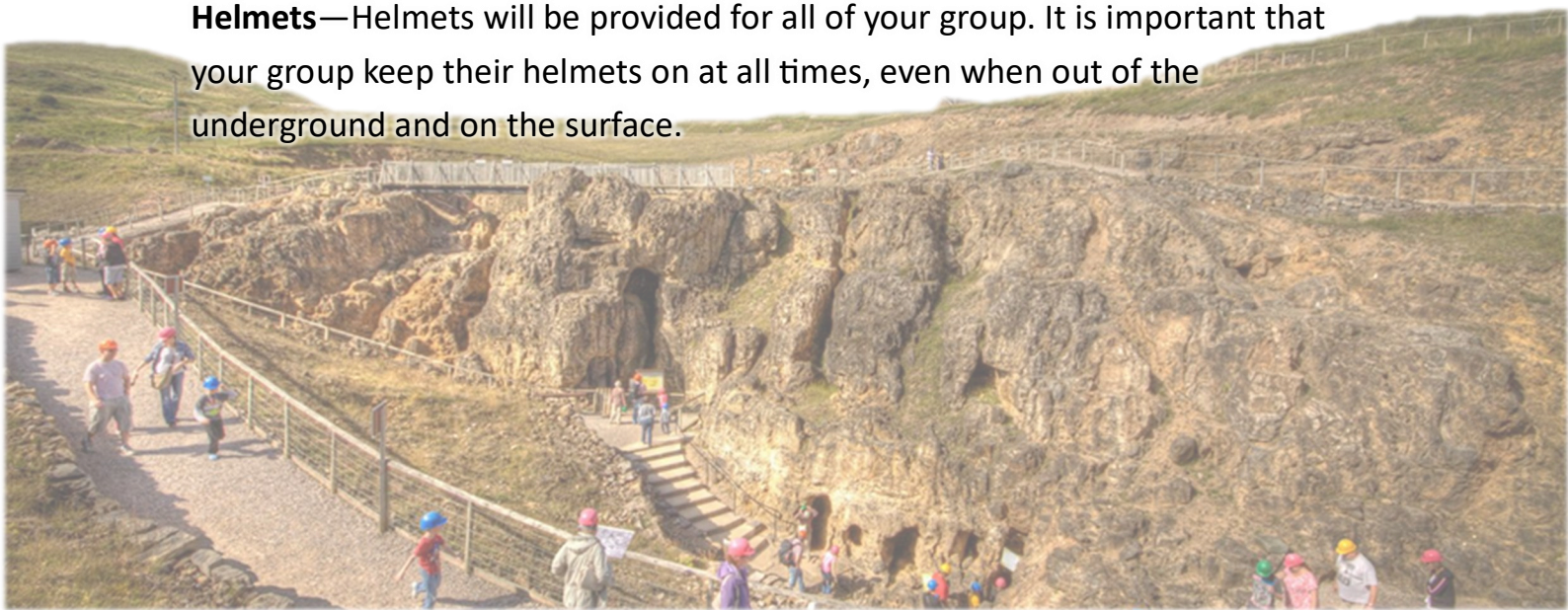
Staying as a group—It's important that you all stay as a group as you walk around site. Children must NOT be left unaccompanied. We recommend that there is a leader at the front of the group and one at the back at all times so that the group is kept together.

Behaviour—You are responsible for your group's discipline on site. Please be considerate of other visitors and school groups.

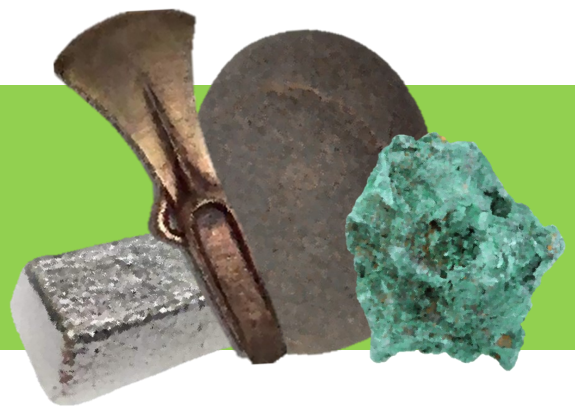
Walkways—Some of the pathways underground and on site are quite steep so it is advised that your group wear sturdy, comfortable footwear. It is important that there is absolutely **no running on site** as pathways can be slippery.

First aid—Please ensure that you carry any medication required by your group members at all times. There is a member of staff with first aid training on site at all times, and if required, can be contacted at the admissions counter.

Helmets—Helmets will be provided for all of your group. It is important that your group keep their helmets on at all times, even when out of the underground and on the surface.



1. STARTING YOUR TOUR



→ You will start your tour in our designated **education room**. Here, there are boards of information as well as artefacts and specimens on display to help your group understand the significance of the mine and the Bronze Age.

We suggest that you **split the group** into smaller **focus groups** in the education room, each with a **group leader**.

Then, starting at the **timeline board**, work your way around the exhibit and **discuss** each board with your group.

Key questions;

When/what was the Bronze Age?

The Bronze Age is the name given to the period of time between the Stone Age and the Iron Age. In Great Britain this period lasted for 1,400 years from 2,200 BC to 800 BC (4,200 - 2,800 years ago).

What is bronze?

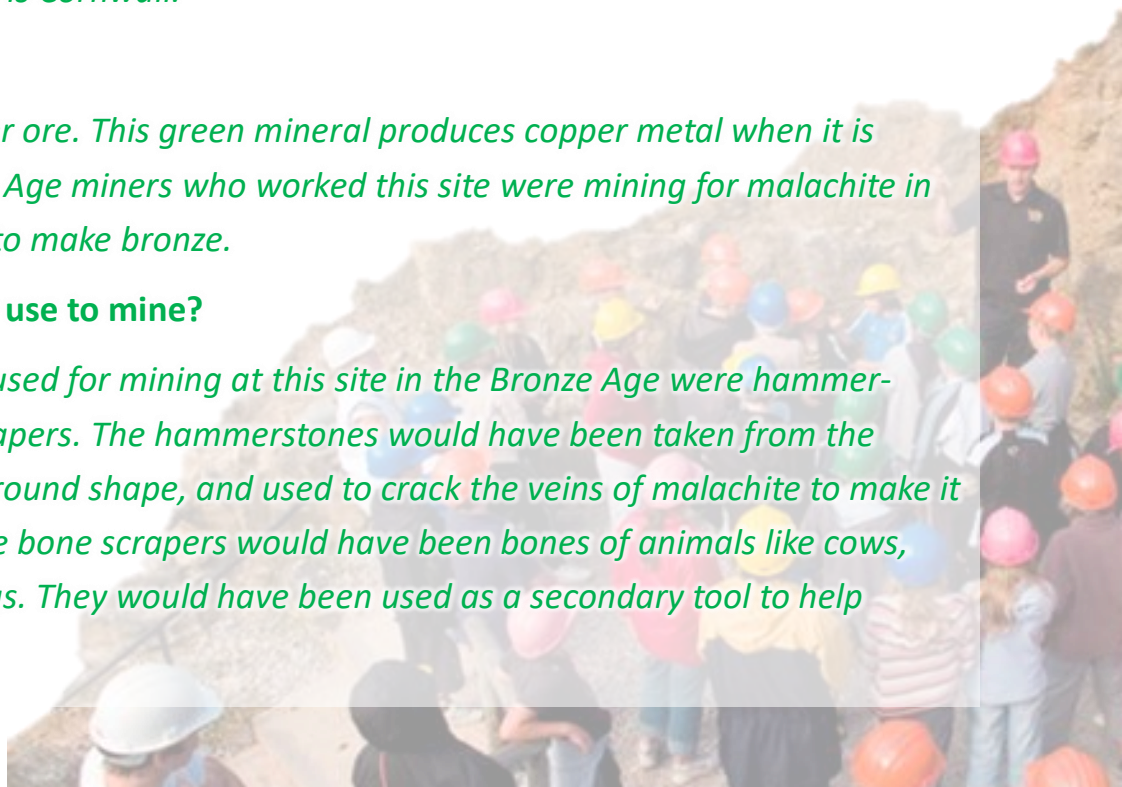
Bronze is an alloy (combination) of copper and tin. British Bronze Age bronze typically contains 90% copper and 10% tin. Bronze was used to make tools and weapons as it is a much harder metal than copper on its own. Copper came from this site and the nearest source of tin is Cornwall.

What is malachite?

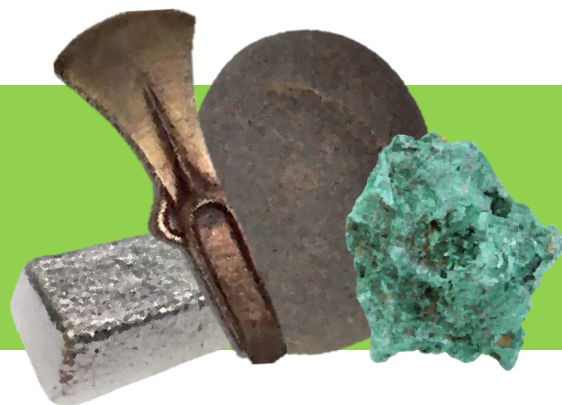
Malachite is a copper ore. This green mineral produces copper metal when it is smelted. The Bronze Age miners who worked this site were mining for malachite in order to get copper to make bronze.

What tools did they use to mine?

The two main tools used for mining at this site in the Bronze Age were hammerstones and bone scrapers. The hammerstones would have been taken from the beach for their nice round shape, and used to crack the veins of malachite to make it easier to extract. The bone scrapers would have been bones of animals like cows, sheep, goats and pigs. They would have been used as a secondary tool to help scrape the ore out.



EDUCATION ROOM CONT.



→ After your group has had a good look at the exhibition boards, gather them all to watch the **film**. It is a five minute film about the rediscovery of the mine and how it came to be what it is today.

IMPORTANT!



Before you head out of the education room, ensure that everyone in your group has an adequately fitted **helmet**. The helmets are all the same size and can be adjusted to fit on the back. There are smaller **light blue** helmets if the others are too big. The helmet should sit comfortably on the pupils head and should not slip off if they look down at their feet.

Please also make your group aware of the following **safety points**;

- **Helmets** must be worn at all times.
- **No running** anywhere on site.
- The group will need to be in single file whilst going through the underground with a **group leader at the front** and **one at the back** to keep the group together. Any other group leaders should spread out in the group and we suggest that any pupils who are feeling nervous should stay near them.
- Please be careful going up and down the stairs and **use the handrails** where present.
- There is **electric lighting** underground however it may seem dark at first whilst you allow your eyes to adjust.
- Space out

2. THE MINE



→ **Whilst underground**, it will be difficult to speak to everyone as a group, so before you head in ask your group to **consider these points** as they walk around;

- From what **age** would you be working in the mines?
- What did they use for **lighting** in the Bronze Age?
- How **safe** was it to work in the mines 4000 years ago?
- Consider how it was all mined out using very **basic tools** like hammerstones and bone scrapers.

The information boards underground will help to answer these questions.

→ Gather as a group once everyone is out of the underground to discuss what you have learnt about the working conditions of a Bronze Age miner.

Age— Children as young as 5 years old would have worked in the mines. Some of the smallest tunnels discovered were only 20cm wide and too small for adult miners to explore.

Lighting— Small animal fat candles were used to illuminate the tunnels 4000 years ago. However, they were very small and didn't give off much light.

Safety— The Bronze Age miners went to great lengths to protect themselves by building stone walls underground to support tunnels with cracked roofs. However, the mines would be considered extremely unsafe compared to today's standards.

Tools— Using large, heavy hammerstones in small, cramped spaces would have been very labour intensive.

Fire— Fire setting was used to help weaken the rock to make it easier to mine.

Working conditions— Their willingness to work in such uncomfortable conditions shows the value and importance of the copper ore to the people of the Bronze Age.

3. SMELTING SHELTER



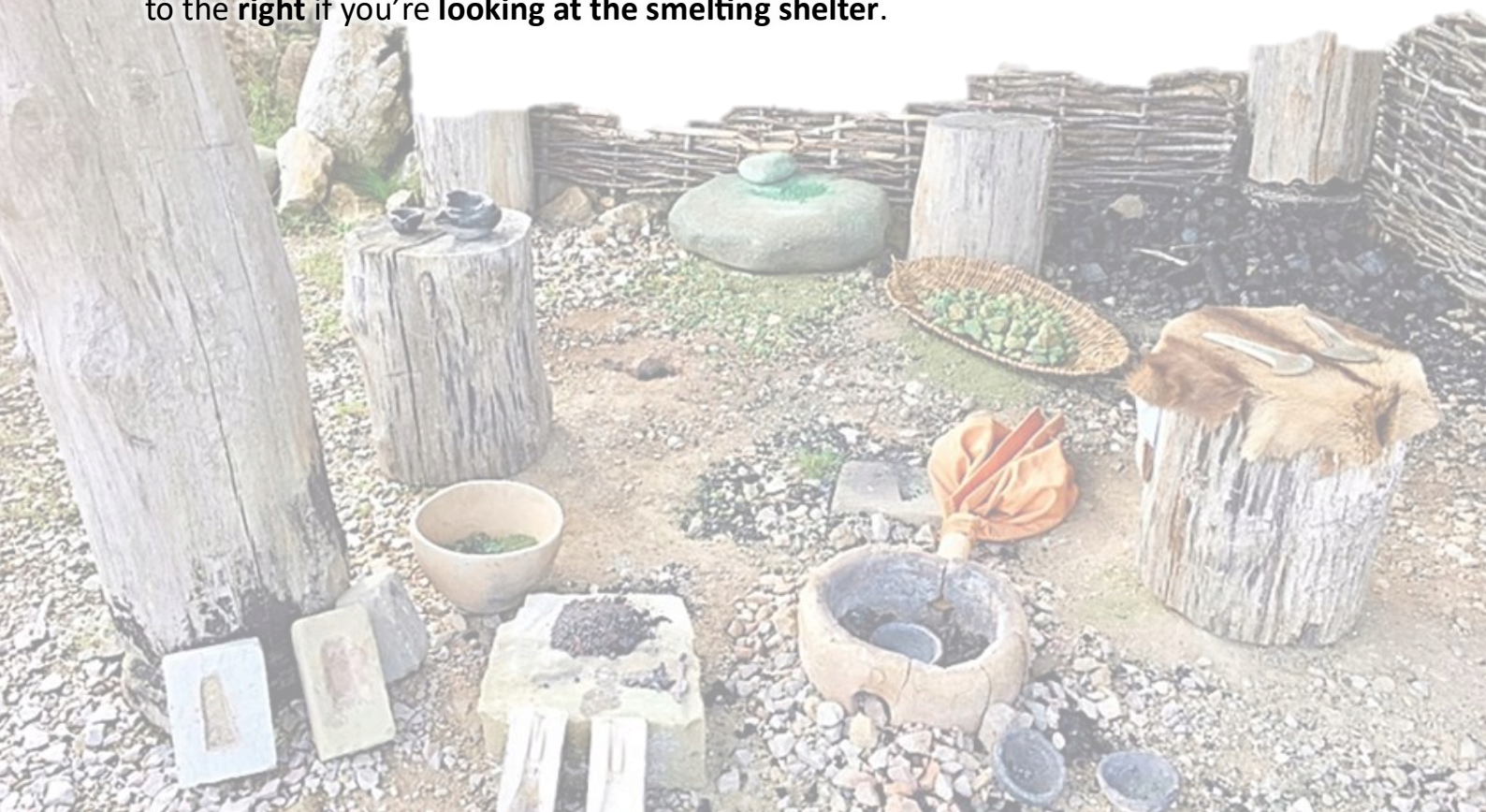
→ This is a **recreation** of a Bronze Age smelting **site**. The film shows the smelting process where **malachite** is crushed to increase surface area and then placed into a **1,100°C furnace**. This reduces the copper ore to **copper metal**. It then shows a small amount of **tin** being added to the copper metal to create **bronze**. This is then poured into a two-part mould to create a **bronze palstave axe head**. The axe head is finished by rubbing with pebbles to smooth it's surface.

ACTIVITY

→ After watching the video, gather around the smelting site and familiarise the group with each labelled object.

Then test the group to see how many of them they can remember and whether they know what they were used for.

→ **Next**, head towards the **big sign** at the back of the opencast which is just round to the **right** if you're **looking at the smelting shelter**.



4. THE OPENCAST AND BRIDGE



This is one of the oldest parts of the mine and it's where mining would have begun over 4000 years ago. The veins of green copper ore would have stood out against the brown dolomitic limestone and would have been an extraordinary sight. The Bronze Age miners would have started mining at the surface before following the ore deep underground.

→ At the opencast, you will see a large sign depicting what this area would have looked like in the Bronze Age. This is useful to help your group visualise how the area was worked whilst further illustrating Bronze Age life.

This area had been completely buried under 19th-century mine waste until 1990 when it was uncovered. The area was scheduled to become a car park but during a survey of the land it was discovered that the mines dated back to the Bronze Age and were far more significant than we once thought.

THE BRIDGE

→ Head over the bridge, and get the group to have a look over the right hand side as you walk past.

The metal grating you see on your right is the top of the deepest shaft at our site. It is called Vivian's Shaft and would have been mined in the 19th Century.

→ If you wish to, there is an audio commentary on the bridge about Vivian's shaft and the surrounding landscape, which your group may find interesting.

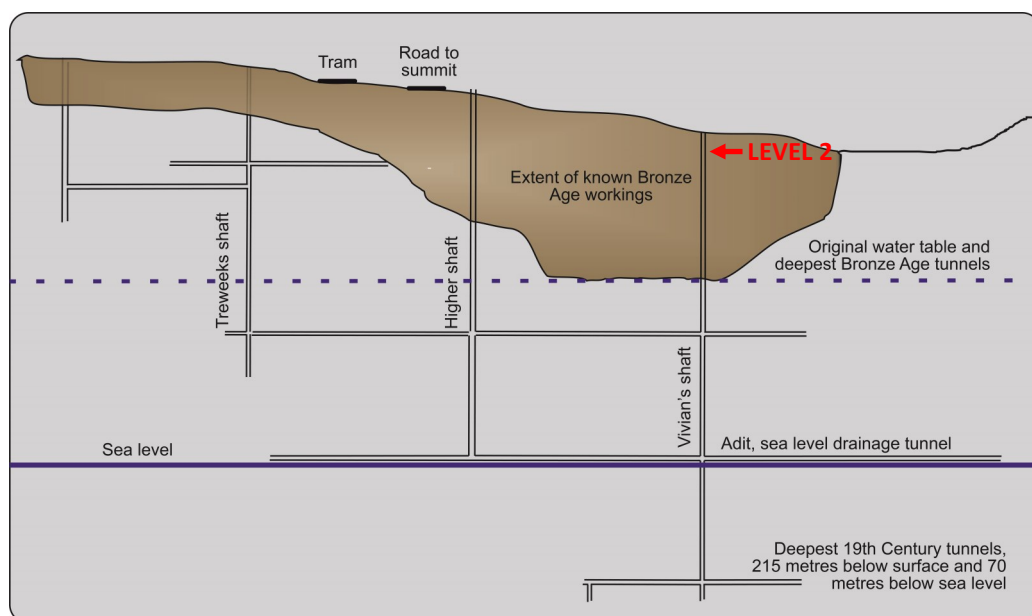
5. 19th CENTURY BOARD



→ Continue to follow the path past the picnic area, where you will arrive at the board pictured below.

This shows a **cross section** of our site and is a good way to help the pupils **visualise** how **deep** the **tunnels** go.

→ You can help to illustrate this further by roughly pointing out Level 2 of the Bronze Age workings, which is as far as your group went, and comparing it to the depth of Vivian's shaft.



Mining in the Bronze Age would have lasted for about 1000 years before it became impossible for them to mine past the natural water table. Mining resumed in the 19th Century as improved technology meant they could create a pump system powered by steam engines which allowed them to drain the water and mine much deeper than their predecessors.

Eventually, the ingress of water became too difficult to manage and the mines were finally abandoned in 1881.

THANK YOU!

This brings us to the end of your tour at Great Orme Mines! We hope you've enjoyed your visit today and have learnt lots about the site. There is a **picture quiz provided** in this pack if you wish to consolidate the key facts from the visit with your group.

We hope you found this guide useful and we hope to see you on site again in the future.





What is it like underground?

The 200m underground visitor route takes you down two levels of the mine which are accessed via a series of slopes and staircases (35 steps down and the same amount back up again). The lighting underground is dim, and there are a few sections where you may have to duck to walk through. Each visitor is issued with a hard hat.

Is it suitable for wheelchairs?

Unfortunately, the site is not wheelchair accessible. There are staircases and narrow walkways.

What is the access like up to Great Orme Mines?

There is no coach access up to Great Orme Mines. We recommend using the tram or arranging to use mini buses. Walking is an option, however, it is quite a steep walk up a busy road so may not be suitable for younger visitors.

What time do you open and close?

The education room will be open at 9.30am and last admission for the room is 4pm.

Can we have our lunch at Great Orme Mines?

We have an outdoor picnic facility which groups can use for their packed lunches. As it is part of the site, we ask that the area is kept clean and rubbish is put in the bins provided.

Is there an area to leave coats and bags?

We don't have an area to leave bags. We would recommend using backpacks or bags that leave your hands free as they are suitable to be worn on the tour.

Are there toilets?

Yes, we have toilets on site that groups can use during their visit.

Do you have a gift shop?

Yes, we have a gift shop. Since the shop is small, we politely ask that no more than 10 pupils are brought into the shop at the time.





How long ago was the Bronze Age?

About 4,000 years ago.

How many levels of Bronze Age

workings are there? *9 levels.*



What is this called?

Malachite.

What is it?

*It's the copper ore that was mined at
this site.*



What is this?

A bronze axe head.

What two metals are used to make
bronze?

Copper and tin.



What is this?

A hammerstone.

What other tool did they use to mine ?

Bone scrapers.



What is this process called?

Smelting.

How hot does the fire have to be in order to smelt malachite?

1,100°C