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STEM at COAM

How do we build our buildings?

CHILTERN OPEN AIR MUSEUM

This week (5th - 14th March 2021) is British Science Week and to celebrate the different areas of science, technology, engineering and maths (STEM) we've been exploring what materials and methods we use to construct the buildings we have onsite.

What can we see when we look at a building?

Here at Chiltern Open Air Museum we have over 30 buildings which have been rebuilt on our site and a lot of them are quite old! It can be really interesting to look at how these buildings were built.

It's not just interesting to look at old buildings though, many of the building techniques that were used in the past are not that different from those used today! This means you can see interesting building techniques or materials wherever you are!

Come for a walk with us around the museum to look at the materials and techniques used to construct our old buildings.

On the next pages we'll point out lots of features of our buildings then, when you go for a walk in your local area, you can see if you can spot the same things on your local buildings.

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How do we build our buildings?

Bricks

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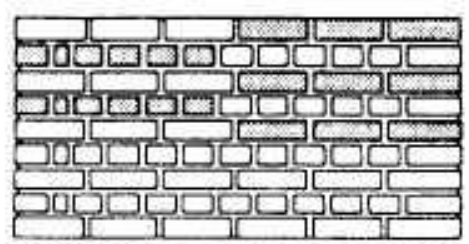
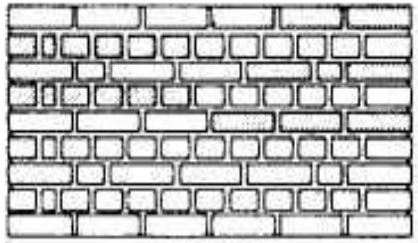
For many people bricks are how you build a building but there are many ways to construct a building and historically bricks haven't been the most common. Originally brought to this country by the Romans almost 2000 years ago, bricks fell out of favour until the Tudor period (1485-1603).

Bricks are made of clay, shaped in moulds and fired in a kiln. They are then laid in a pattern known as a 'bond'. Have a look at the diagrams below and see if you can spot these patterns on brick built buildings when you are out for a walk.



ENGLISH CROSS OR DUTCH



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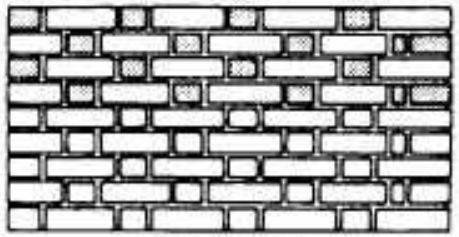
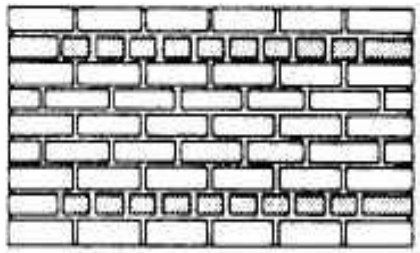


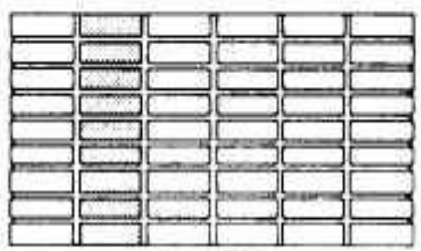
FLEMISH

Some of the many brick bond patterns to keep an eye out for



COMMON OR AMERICAN

RUNNING



STACK

The size of bricks has changed over the years

Haversham Granary

Can you tell which brick bonds have been used here?:

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Wood

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Before we used bricks in this country (and after the Romans) we built out of wood. One of the best examples at our museum is Arborfield Barn. Dating from around 1500 Arborfield Barn is a **cruck framed barn**. This method of framing dates back to at least the 1300s.

Cruck blades

The roof and walls of Aborfield Barn are supported by cruck blades. Cruck blades are curved beams made from a single piece of wood which has been split length-ways, giving an identical pair of curved timbers. We have four pairs of these cruck blades in our barn.

You are unlikely to see a barn like this out on your walks but you might see houses made of bricks with a wooden frames.

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Walls

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The walls of a lot of newer wooden framed buildings are often made of brick but would have originally been made of **"wattle and daub"**. 'Wattle' describes the woven wooden screen over which 'daub' is plastered. Daub is some kind of mixture of clay, animal dung and straw. We have walls of this type on our only reconstructed building at the museum, the Iron Age Roundhouse.

Buildings like our Iron Age Roundhouse would have used local resources, the rafters on our house are tied on to the frame using clematis from the woodland.

Wooden framed buildings are often clad with wooden **weatherboards**. We have several examples here at the museum. The buildings below are both in our farm yard.

Rossway Granary clad in **weatherboard**

Marsworth Cattle Shelter, Stable & Cart Shed clad in **weatherboard**

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How do we build our buildings?

Roof Types: Thatch and Slate

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When looking at a building you are sure to spot its roof. It is not something we normally spend time looking at but it is a very important part of any building. When we look at buildings like Arborfield Barn or the Iron Age Roundhouse we can see that the roof is made of straw. These are **thatched roofs**, the ultimate in sustainability in it's time. Straw is the unused stalks of cereal crops. These days the crops we grow have been bred to have short stalks so cannot be used for thatching. Some farmers grow "heritage" crops to be used especially for thatching.

The thatched roof on Aborfield Barn

Another common roofing material you might see is **Slate**. Roofing slate is a particular kind of stone which splits into very thin sheets. These are then nailed onto the wooden roof battens. The biggest problem with slate is that it can only be found in certain places, so it needs to be transported to your building site. Historically one of the biggest sources of roofing slate was North Wales.

Roofing slate

Haversham Granary (above) and High Wycombe Furniture Factory (left) with slate roof

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How do we build our buildings?
Roof Types: Tile and Metal

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An alternative to slate is **roofing tile** which is made from fired clay, in the same fashion as bricks. Roof tiles could be manufactured anywhere the raw materials were available. Roofing tiles are the most common roofing material in the UK, see if you can spot some of these roofs when you are out for a walk.

Roofing tiles

Hill Farm Barn with a tiled roof

At the Museum we have some quite uncommon roofing and building materials that you probably won't see on your travels.

Henton Chapel, WW2 Sewell Nissen Hut, WW1 Bow Hut and Glory Mill are all built and roofed using corrugated iron, sometimes known as wriggly tin.

Henton Chapel (above), WW1 Bow Hut (top right), WW2 Nissen Hut (bottom right))

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How do we build our buildings?

Concrete

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Another building material you might see out and about is **concrete**! You might think it's a modern material but the first people to use it for building were actually the Romans! Go online and check out the Pantheon in Rome. At our museum the only concrete building we have is Amersham Prefab. Our prefab is built from concrete and asbestos panels that were made or "prefabricated" in a factory, transported to site and bolted together for quick and easy construction.

These photos are of our 1940s Prefab. The prefab is built from 26 asbestos cement panels, bolted together on a wood and steel frame. This stands on top of a concrete base.

Why don't you have a look more closely at the buildings around your local area and see if you can work out what they're made from and how they've been made? Can you spot any of the building methods or materials that we've shown you? We'd love to see any unusual or quirky buildings that you spot, be sure to tag us in any photos!

Then, when we are open again, you can come and visit us and have a look at our buildings and the way they are made!