

Education

Teacher's Kit

General history of brick making

Simple bricks can be made by drying clay in the sun. Sun-dried bricks were utilized for many centuries and are used even today in regions with the proper climate. At the beginning of the 19th century mechanical brick-making processes began to be patented and by the latter half of the century had almost entirely replaced the ancient hand-fashioning methods. The Victorians used enormous quantities of bricks for house building and for engineering projects such as warehouses, factories, mill chimneys, and railway viaducts.

Making a brick – the process:

- The clay has to be dug from a suitable deposit. It is usual to situate a brickworks next to a clay pit, or even in it.
- Most glacial clay contains some small stones. If these get into the brick they will weaken it and may even cause it to crack open while being fired. The clay is therefore mixed with water in a wash-pit. The stones fall to the bottom, and the clay/water mix is run off into shallow ponds. In these the clay slowly sinks to the bottom, whereupon the water can be drained.
- The washed clay is plied up to weather for a few months. Clay does not always need washing: it can be pure enough to be weathered direct from the face.
- After weathering, the clay is mixed with water again in a pug-mill, which squeezes the clay out in a soft, very malleable form.
- Straight away the clay is shaped into bricks or tiles, in the past and still at some yards today this was done by throwing it into a sanded wooden mould (the sand stopped it sticking), levelling the surface and turning it out.
- These 'green bricks' would then be stacked in long, low drying sheds, for the wind and air to dry them out again. If bricks are too wet when fired the steam building up inside them can make them explode. Today there are machines of various types to form bricks. These can use dryer clay and in some cases make bricks which can be placed straight in a kiln.
- The final stage is the firing of the bricks. Originally the heating was done in clamps, something like the mounds used by charcoal burners. The unfired bricks would be stacked up, surrounded by fuel and covered in soil. From Tudor times onwards kilns have been used, with the bricks stacked into a large kiln and then baked using fires of wood, charcoal or coal. The whole process takes five or six days, with firing necessary day and night for perhaps three days.



Photo and drawing of the brick works at Blists Hill, Ironbridge
© Ironbridge Gorge Museum Trust

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Over the last hundred years more complicated kilns have been developed, notably down-draught kilns. The biggest kilns are Hoffman kilns which have a large number of chambers and where the fires are alight all the time, moving round from chamber to chamber. Most bricks today are fired in Hoffman kilns.

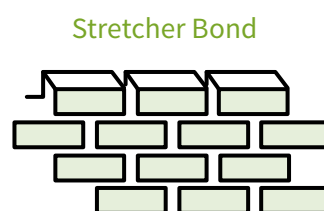
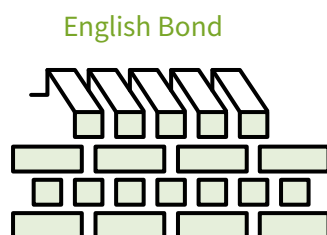
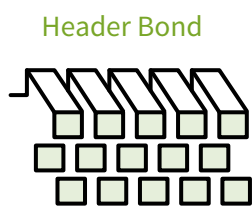
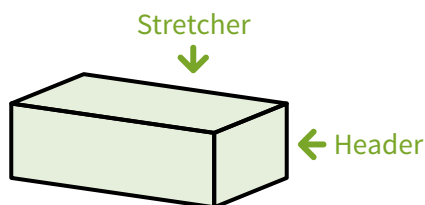
The colour of bricks

The colour of the fired brick is dependent on a number of factors:

- **Impurities in the clay**
The red colour associated with bricks comes from iron in the clay. Clays with a higher lime content will produce white, cream or yellow bricks. Powdered chalks can be added to produce more fashionable whiter bricks. Old houses may have bricks which look grey on one face and red on the other. These bricks were fired using wood as fuel and the wood ash has vitrified exposed surface, turning them grey, this different colour was often used to produce patterns.
- **The heat reached by the kiln**
The hotter the kiln the deeper the colour of the bricks, with a bluish tint coming in for very highly fired bricks.
- **The qualities of the clay**
Some clays will take a much higher firing temperature than others and these are used to make purple and blue bricks. The higher the temperature the harder and denser the brick, so blue bricks are used for engineering structures like bridges. Other fine clays produce very hard, shiny, bright red or cream brickwork known as terracotta, which is very resistant to weathering and therefore popular for decorative bricks or seaside use.
- **The use of chemicals**
In modern bricks the colour is often produced by treating the surface with chemicals before firing. Some bricks were salt-glazed, salt was added during the burning process or the bricks are dipped into a glaze material or 'slip', giving the brick a shiny, ornamental surface.

Brick patterns

If bricks were placed on top of each other in straight columns when walls are built, the structure would be very weak. Instead, they are laid in overlapping layers and the resulting patterns are called bonds.



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Take a walk around your town with your class, looking at the types of bricks you can see.

- Look at the building - Is it domestic, industrial, grand or simply designed?
- Look at the colours and decorative uses of the brick - what does the style of brick work tell you about the people who lived in or owned the building and the use of the building or structure?
- Do you think the brick was made locally? Why/not?
- How might the brick have been transported to the site?
- Are there other buildings using similar coloured brick in the area?



Ditherington Flax Mill, Shropshire
© Historic England Ref: N060075



Courtyard at the Old Merchant's House, Great Yarmouth, Norfolk
© Historic England Ref: N090562



Barratt Shoe Factory, Northampton
© Historic England Ref: BB001829



Recovered bricks at Audley End House, Essex
© Historic England Ref: N080647

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Activities

2: Build your own brick works

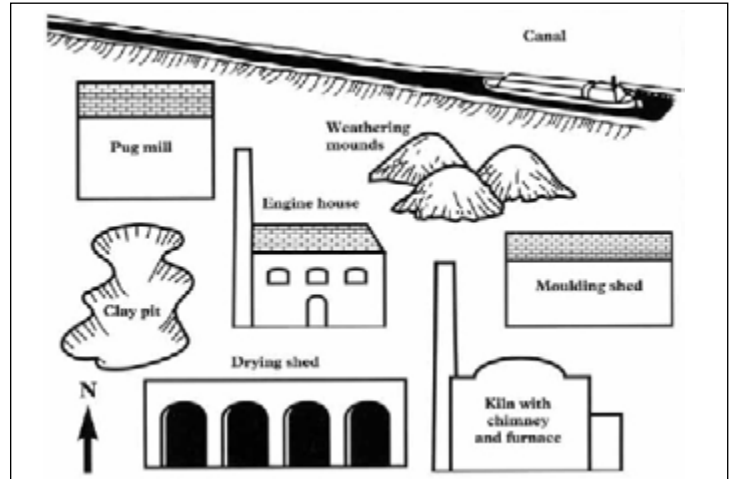


Photo and drawing of the brick works at Blists Hill, Ironbridge
© Ironbridge Gorge Museum Trust

Industrial buildings are usually logical in their layout, with buildings placed next to one another according to their function in the process. Look at the drawings of parts of a brickworks and put them in order according to the brick making process. Compare your brickworks with the photograph of the brick works at Blists Hill in Shropshire. Have a go at identifying the separate parts of the building.

Here is a resource pack produced by the Ironbridge Gorge Museum Trust Education Department which accompanies the brick making workshops available at Blists Hill Victorian Town. ironbridge.org.uk/assets/Uploads/resource-brick-making.pdf