How The Bells Are Made

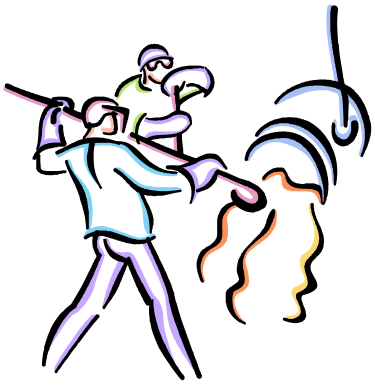
Early bells were made from sheets of metal bent into a four-sided shape and riveted together. The better ones were dipped into molten bronze, which filled all the openings and coated the bell, making the sound stronger and deeper in tone or more **resonant**. They were probably struck with a hammer or small mallet – the metal strikers that hang inside bells called **clappers** were a later development.

The art of **bell founding** or the **casting** of bells was known to many ancient civilisations. In Britain, bell founding was first undertaken in the medieval monasteries. The skills then passed to travelling craftsmen and then to bell founders who set up permanent workshops called **foundries**.

Bell founding methods have not changed much over 400 years. Two **moulds** are made – an inner and an outer, with a space between into which the molten metal is poured to create a given shape when the metal hardens.

The largest bell in the world is the Tsar Kolokol, weighing a whopping 195 tonnes. It was cast in Moscow in 1735 but before it could be hung, it was damaged by a fire in 1737 and cracked. The fragment that broke away weighs about 11 tonnes! Since then the bell and fragment have stood on a platform in Moscow.

Bell metal is a combination of metals or **alloy** of 77% copper and 23% tin. An alloy is a combination of two or more elements, one of which is metal where the resulting metallic substance has different properties from the original elements. The copper and tin is heated to around 1200 ºC in a furnace, poured into the prepared mould and allowed to carefully cool. Then the mould is broken open to reveal the bell.



Although a bell may appear to have only one note, it actually produces several notes giving the bell its remarkable ‘bell-like’ sound. Bells are now tuned by shaving metal from the inside of the bell with specially designed machinery and using electronic sensors to analyse the notes made by the bell.