GENERAL

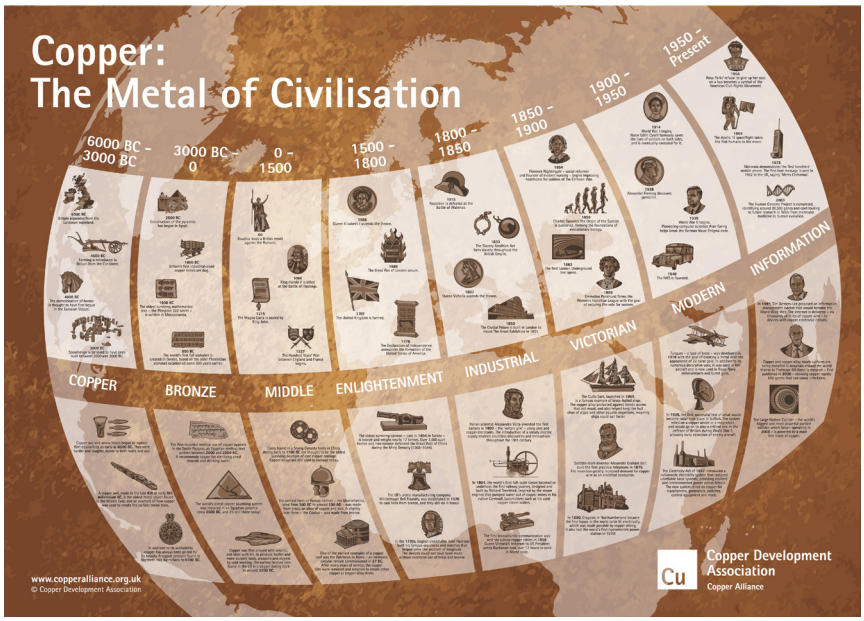
11 - 14 YEARS

14 - 16 YEARS

Copper and its alloys in History

Copper has made vital contributions to sustaining and improving society since the dawn of civilisation, from the most basic tools of the Copper Age almost 10,000 years ago, through to the Large Hadron Collider, as can be seen in the timeline poster below.

One of the reasons copper is so important is that it can be made into alloys. That means it can be combined with other metals to make new alloys, such as brass and bronze. These are harder, stronger and more corrosion-resistant than pure copper.



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Early uses

The first copper objects were decorative because copper is attractive and easy to shape. For example, earrings, rings, brooches, bracelets, combs and mirrors have been discovered from the ancient civilisations of China, India, Peru and Rome. They display a high level of craftsmanship and artistic skill. These sorts of articles are still being made today and sold in markets all over the world.

Did You Know?

Copper was once used to make dinars and is used today in euros. Euros contain various copper alloys such as Nordic gold, which was specially developed for the new currency. Over time, copper has overtaken gold and silver as the most commonly used metal for coins.

Made from a single sheet of hammered bronze plate, this rare diadem was probably worn by a high-ranking woman during the Late Bronze Age. Date: 1200 - 800 BC. Experts think it was worn the other way up with the spirals at the back. (Courtesy of Metropolitan Museum of Art.)

This gilded brass watch was made in London and dated 1600–1610. Brass is non-magnetic and easy to machine into fine gears. (Courtesy of Metropolitan Museum of Art.)

Later uses

Some early civilisations realised that bronze could be melted easily and cast into shapes. Furthermore, it could be hardened by working the metal. So they began to use it in new applications: axes, knives, chisels and bowls. These were much more effective than their clay or stone counterparts, which were brittle and more fragile.

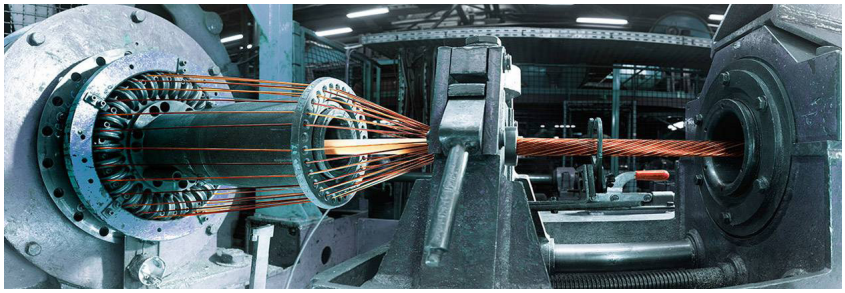
Trading

Valuable copper and bronze articles were traded across the world for cloth, furs and food. This led to an improvement in living standards.

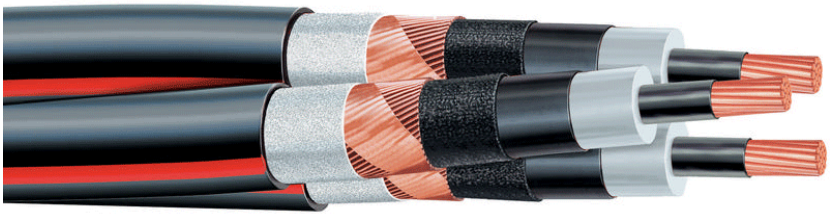
In Britain, the Bronze Age started in about 2000 BC. Copper and tin were mined in Cornwall and Wales. At one time, Britain was the biggest producer of tin in the world, supplying those countries which had copper, but no tin, to make bronze.

More modern times

Much later, copper and zinc were alloyed to make brass. This found many uses as Britain developed into a major industrial country. From the 20th century, it is copper's electrical properties that have dominated its uses. 60% of copper is used in electrical and electronic goods.

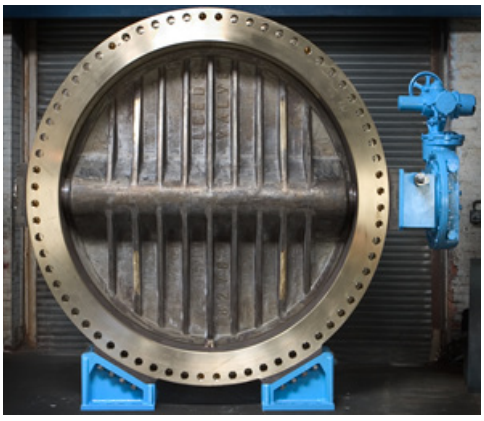


High voltage copper cables supply electricity to millions of homes and businesses around the world. This machine spins cable from thinner strands of copper wire. (Courtesy of Prysmian.)



A typical 3-core power cable used in electricity distribution. (Courtesy of Brugg.)

A modern bronze valve that can control massive flows of corrosive sea water in desalination plants and power station cooling pipes. Open... (Courtesy of Severn Leeds Valves.)



...and shut. (Courtesy of Severn Leeds Valves.)

Questions

1. **Copper alloys, such as bronze, hardly corrode at all and have survived for over 2000 years, even under the sea. They have always been highly-valued alloys. For historians, this has advantages and disadvantages.**
   What are these?

2. **What properties of brass make it suitable for manufacturing watches and clocks?**

3. **List all the properties of bronze that make it suitable for the huge valve on the right hand side of page 2.**

4. **What was the turning point in the history of science and technology that led to a huge increase in the use of pure copper?**

Click here for answers