NATIONAL MINERALS WEEK 2016

How Minerals Keep Us Working

The Institute of Quarrying

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www.quarrying.org

What's it all about?

There are metals all around us that have been part of our everyday environment for over 10,000 years, so familiar to us that they are given little thought as to how they are produced. Whilst modern processing methods are much improved from the medieval periods to which they can be traced, they are still ultimately produced from minerals that are extracted from the ground.

The use of minerals in our daily lives has enabled us as a society to become more productive and to be able to create wealth. Minerals and metals have provided the tools to enable us to work smarter and harder.

Iron, **nickel** and **zinc** are some of the most common metals that support us in our working lives. Through alloys they create steel, stainless steel and galvanised steel that are used in a multitude of applications from construction and building through to machine and hand tools. So we have the equipment needed to do the job as well as a place to work.

Definitions:

Alloy - a metal made by combining two or more metallic elements, especially to give greater strength or resistance to corrosion.

Our place of work is further enhanced through **tin**, which is used in the window production process, **copper** to provide electricity and **tungsten** to provide the fluorescent lighting. Although lighting is increasingly turning to LED, this style of lighting is still dependent on quarried minerals.

We are also dependent on minerals for computers, mobile phones and all manner of electronic devices. Along with tin and copper, **silver** and **gold** are crucial in providing the electronic circuitry, transistors and circuitry required to make modern communication devices work.

As working life becomes increasingly dependent on technological machines and gadgets, the energy source that makes them work becomes important to ensure that they are reliable. Again minerals play their part by providing the **lithium** to make the batteries that powers this equipment.

Mineral extraction in the UK has a £15 billion turnover and 16% of the whole economy can be directly attributable to minerals*. Whilst identifying the total value of minerals to the transport sector is a challenging task, we do know that:

- The production of electricity (excluding distribution) generates £2,4 billion in gross value add (GVA) to the economy
- Electrical equipment generates £4.2 billion GVA
- Communication equipment accounts for £1.7 billion GVA
- Computers generate £1.1 billion GVA
- Electronic components generate £1.6 billion GVA
- Metal products generate £13.8 billion GVA
- Machinery generates £10.5 billion GVA
- Buildings equate to £38.5 billion GVA
- The production of glass generates £1 billion GVA

*Figures from CBI The UK Minerals Extraction Industry report February 2016, prepared by Minerals Products Association (MPA) http://www.mineralproducts.org/documents/CBI_UK_Mineral_Extraction_Industry_2016_2.pdf

Without minerals in our life, we would know very little about the world we live and work in. We have always been able to develop new products and find new ways of working that have benefitted and advanced the lives of many in society. Through the use of minerals, we are now more productive and connected than at any point in history.

Key Mineral Facts

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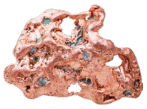
Copper



The oldest metal known to man, first used by humans over 10,000 years ago. Roughly half of all copper extracted is used for electrical wire and cable conductors but is also commonly used in heating and cooling systems, automotive applications and coinage. World producers are Chile, China, Peru and USA.

Gold

A highly valued precious metal widely known for jewellery and decorative purposes as well as a store of wealth through bullion & coins. About 10% of all gold goes to industrial uses like electronics for circuitry and transistors. Major global producers are China, Australia, USA and Russia.

Iron

One of the most abundant metals in the Earth's crust (after aluminium), more iron is produced than all other metals put together. Its low cost and high strength means it is alloyed to make steel and widely used in construction, machine tools, automobiles and shipbuilding. Leading world producers China, Australia and Brazil.

Lithium

Just over half of all lithium is used in processing silica in the glass and ceramics industry or in the production of lithium-ion rechargeable batteries for mobile phones, laptops, digital cameras and electric vehicles. Key country producers are Australia and Chile followed by Argentina and China.

Nickel

Used as an alloy to create stainless steel, in construction it is often used as a plating to strengthen and decorate (for example the Empire State and Chrysler Buildings in Manhattan). Key country producers are the Philippines, Russia, Indonesia and Australia.

Silver

Known for its use in jewellery, silverware, mirrors, photography and coinage. Its main use is in industrial applications, particularly electrical. Found in the contacts in electrical switches, solar panels, batteries and elements built into car windscreens to defrost ice. Major country producers are Mexico, Peru & China.

Tin

About half the world's consumption of tin is used as a solder to join everything from pipes to electric circuits but is also used in the glass window production process (known as the Pilkington method). China and Indonesia are dominant country suppliers followed by Peru and Bolivia.

Tungsten

Historically known as the material that made the filaments for the old style light bulbs and is still widely used in fluorescent lighting. Tungsten produces a very hard metal that is good for cutting and drilling, particularly in the metal-working, mining and petroleum industries. China is the leading world producer supplying over 80% of the total global supply of tungsten.

Zinc

A very commonly used metal as an anti-corrosion agent to coat iron and steel. Applications include chain link fencing, guard rails, suspension bridges, light posts and metal roofs. Also used in the production of batteries. Top world producing countries are China, Australia and Peru.