ORESOME RESOURCES
Minerals and Energy Education

Olympic Games Minerals Trivia

Minerals, Medals, Torches and Stadiums

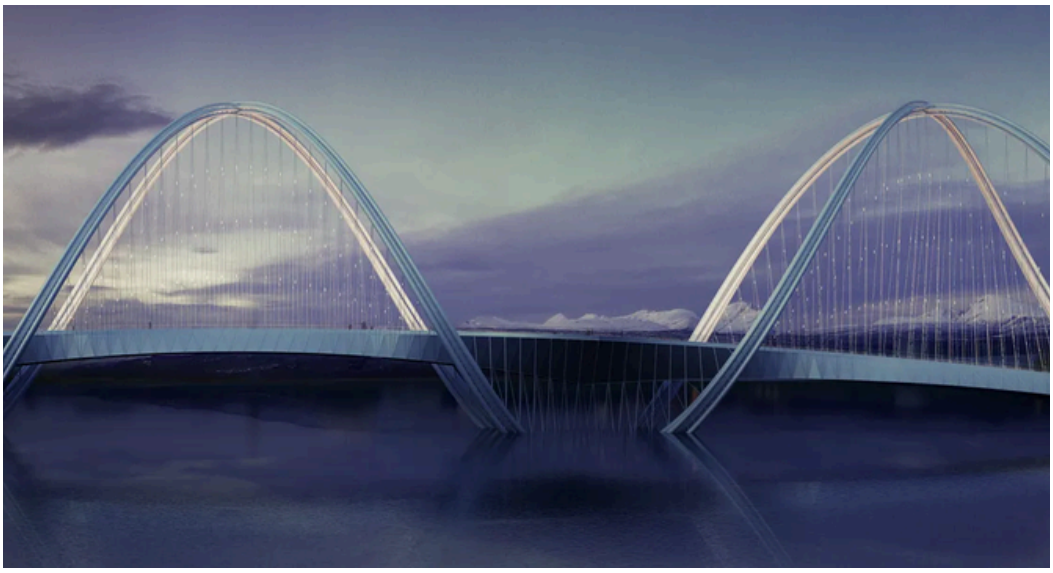
The gold medals presented to winners at the Olympic Games are not made of solid gold – they are mostly made of silver (92.5%) and copper (6.16%) with just a pure gold coating that must contain at least 6 grams of gold. Medals typically weigh between 375 and 400 grams and must have a minimum diameter of 70mm and be 3mm thick.

The Olympic torch is a symbol of peace and friendship. Many mined minerals have been used in their construction and design including steel, aluminium, copper, silver, and brass.

Road cycling is one of the oldest Olympic events, with races taking place on paved roads throughout the host city. The bikes are made of alloys containing iron, magnesium, titanium, chromium, molybdenum, aluminium and manganese that are very lightweight yet very strong.

Olympic host cities need to build new infrastructure and upgrade existing facilities to meet the needs of athletes and spectators. Stadiums that hold opening and closing ceremonies and athletic events are made of steel, an alloy of iron and carbon, because it is strong, resistant to rust, and easily shaped into clever and iconic designs. Over 10,000 tonnes of steel could be used in the construction of a new stadium!

Minerals, Bridges and Solar Power



Bridges and tunnels allow visitors easy access to all the venues. Strong, flexible, and durable steel is used in building transport bridges and tunnels. Pedestrian bridges can be made from aluminium, which is strong and lightweight allowing for easier installation.

The Olympic Games are increasingly sustainable, with renewable energy sources helping to power venues. Solar panels, which require mined metals and minerals including silica, tellurium, cadmium, titanium, and copper, are installed on the roofs of sporting venues like aquatic centres.

Minerals, Measuring and Moving

The results in the 100-metre sprints can be so close that the naked eye could not pick the winner. Modern electronic equipment, using a vibrating quartz crystal, can measure athletes' times to within 1/1000th of a second! Electronic components also contain silicon and metals such as gold, silver, copper, and platinum.

Imagine field events such as the shot put, high jump, discus, hammer throw and javelin without metals to make the equipment. A shot put made of wood (instead of heavy iron, brass, or stainless steel) wouldn't test the athletes' strength very much, would it?

Sailing is also an Olympic event, and it would be impossible for the yachts to keep upright in strong winds without their very heavy cast iron, steel, or lead keels; or to sail efficiently without their lightweight yet strong and flexible masts, booms and spinnaker poles made from alloys of aluminium, copper, siliconsilicon, and magnesium.

It is not only the Olympic events that depend on the amazing properties of metals and minerals in some way! Hundreds of thousands of people will travel to, from and around the Olympic venues in planes, boats, trains, cars, buses, motorbikes, and bikes all made from many sorts of minerals and metals. Every moment of every day, people depend on items made from our earthy resources.

Where would the Olympics be without all these metals and minerals?!

Olympic Games: An A-Z of Minerals and Metals

Aluminium

Rust-resistant, able to be shaped, lightweight yet strong, aluminium is the basis for many types of sports equipment in the Olympics - from the upright posts of a high-jump crossbar to the frame and pedals of a state-of-the-art racing bike or the masts, booms, and spinnaker poles of racing yachts. Aluminium also has many uses in construction, from roofs to air conditioning units and furniture.

Copper

Copper makes an appearance in many areas of the Olympics due to its multifunctionality: it has a shiny pink-brown colour, conducts electricity and heat, and is able to be shaped. Copper is found in all the Olympic medals – about 6% in the gold and silver medals and 97% in the bronze medal. Other uses of copper include in electrical devices such as lights, heaters, and the heater coil inside the Olympic torch.

Gold

Where would the Olympic Games be without beautiful shiny medals coated with gold and placed around the necks of the winners? With six grams of gold used in every gold medal, that's a lot of gold! Gold is also used in essential electronic devices such as timing and scoring equipment.

Iron

Iron, as the main component in steel, is used to make shot puts, the rims of discus, arrow heads, and the keels of Olympic yachts to keep them stable and upright. Steel is also used in sports equipment including bike pedals, the hollow tube of javelins, an archer's bow, weightlifting equipment, and the base of high jump bars. When alloyed with other metals, steel is tough, rust resistant and easy to shape. It is therefore the main construction material for the various Olympics venues including stadiums and aquatic centres.

Quartz

A vibrating quartz crystal is used in electronic equipment to measure the times of athletes, swimmers, and other competitors to within 1/1000th of a second! Quartz is also used to make glass.

Olympic Games: An A-Z of Minerals and Metals

Silver

Perhaps the most important use for silver in the Olympics is to make the medals – but not just the silver medals, even the gold medals must contain over 92.5% silver! Silver is also used in electronic devices as it is a very good electrical conductor. You'll also find silver in the photographic and film industries, ensuring all the highlights of the Olympics are captured.

Magnesium

Even lighter than aluminium, magnesium is used in many pieces of sports equipment including golf clubs and tennis racquets. However, perhaps its most visible use will be in the fireworks display for the opening and closing ceremonies. Magnesium powder burns with a bright white flame.

Titanium

Titanium's amazing strength yet light weight makes it very useful for various sports equipment including bike parts, yacht masts, and badminton and tennis racquets. It's most important role in the Olympics, however, will be as titanium dioxide, which is the basis of all paints. So, you will 'see' titanium dioxide in the paintwork of the Olympic venues and in the markings on athletic tracks and swimming pools, helping to keep the competitors in their lanes!

Zinc

As the "Great Protector", zinc is used to coat steel (on the Olympic buildings and other metal structures) to protect them from rusting. A tiny amount of zinc is also used in the bronze medal. Perhaps many of the spectators will be using zinc-based sunscreens to protect them from the sun's rays.