

24 carat

GOLD FACTS

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Outer space

Gold-coated visors help protect astronauts' eyes from dangerous rays in space. Gold is also used on various surfaces of spacecraft, including the windshields of jets, as well as modules and space stations because of its high resistance to solar radiation.

Back on earth, city buildings like the Royal Bank Plaza in Toronto, also benefit from gold's reflective properties. Its 14,000 windows are coated with a thin layer of 24 carat gold – around 2,500 ounces – to reflect light and reduce power bills.

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Ancient Egypt

The Egyptians discovered gold in the Nile River as long ago as 5000 BC. The metal was considered divine and indestructible and took on many associations. The royal tomb was called The House of Gold; the Sun God was known as the Mountain of Gold; and the Pharaohs became The Golden Horus.

King Tushratta of the Mitanni boasted gold 'more plentiful than dirt'. King Tutankhamun's death mask, made of solid gold and crafted with extraordinary skill, would prove the Egyptians right. Discovered by archaeologists some 3000 years later, the mask was intact and just as shiny. Gold was indestructible.

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Medieval nantechonology

The first nanotechnologists were medieval artisans. They discovered that mixing varying amounts of gold chloride in molten glass created tiny gold spheres that reflected light and produced different colors. Stained-glass windows are some of the earliest examples of nanotechnology at work.

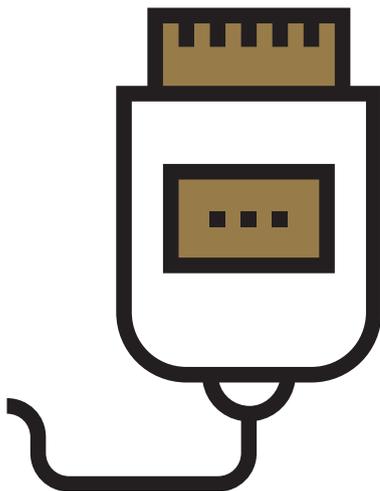
The Lycurgus Cup – a 4th century Roman glass cup – is another. The incorporation of nanoparticles centuries ago makes it appear either red or green depending on the direction of the light.

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Electrical conduit

Highly conductive to electricity, gold has been used in telecommunications equipment since the 1930s. From fuses to switches to microchips in computers and mobile phones, gold is a preferred material for its high conductivity and its resistance to corrosion. Even the identification microchip implanted in the family pet likely contains gold.

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Space rocks

Nearly all the gold on earth came from meteorites that battered the planet more than four billion years ago. At least, that's the theory held by most scientists today and the subject of a 2011 paper which appeared in the journal, *Nature*. Scientists believe a 200 million-year-long meteorite shower brought 20 billion billion tonnes of space rock – rich with gold and precious metals – to earth.

Hot liquids that flowed through the gold-bearing rock millions of years subsequent delivered the veins of gold we mine today.

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A troy ounce

An ounce of gold is heavier than a standard ounce. That's because gold uses the troy ounce unit of measurement. One troy ounce is equivalent to 31.1034768 grams. The standard gold bar held by central banks and traded by bullion dealers is the 400 troy ounce (12.4 kilograms) 'Good Delivery' bar. The minimum purity required of the 'Good Delivery' bar is 99.5 per cent.

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Edible gold

Edible gold is having another moment. Gold leaf, flakes and dust are garnishing everything from donuts to hot dogs, appearing in social media feeds across the globe. Nestle Australia even got in on the act this year, releasing a 24 carat gold-coated Kit Kat to celebrate the Chinese New Year. Edible gold is not a new concept. Italian nobility embellished their meals with gold

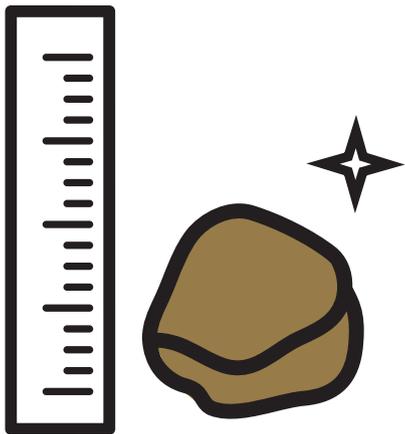
leaf, and gold dust tea has been a tradition for centuries in parts of Japan. Chemically inert and safe to digest, gold costs between \$50 to \$60 per gram. It contains no taste, texture, calories or expiration date.

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World's biggest nugget

'The Welcome Stranger' is the world's largest gold nugget ever found, unearthed by Cornish miner John Deason at the base of a tree near Moriagul in central Victoria on 5 February 1869. Buried just 3 centimetres beneath the surface, Deason waited until nightfall before digging it out with his partner,

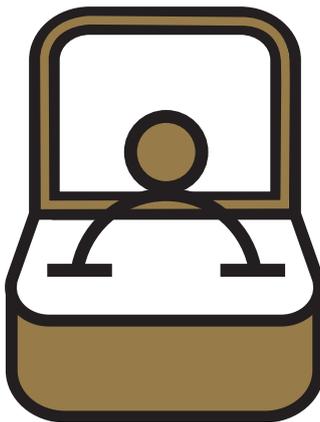
Richard Oates. The duo took their find to nearby Dunnolly, where it was broken on an anvil before it could fit on the bank's scales. Weighing around 2300 ounces (about 70 kilograms), the London Chartered Bank of Australia paid them an estimated £9381. Today it would be worth around A\$4 million.

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A gold 'carat'

Carat is a measure of gold purity or fineness – not to be confused with 'carat', the unit of weight applied to precious stones, such as diamonds. The word itself derives from the carob seed, which gold merchants used to balance scales in ancient Asian bazaars. It was decided a pure gold coin weighed the same as 24

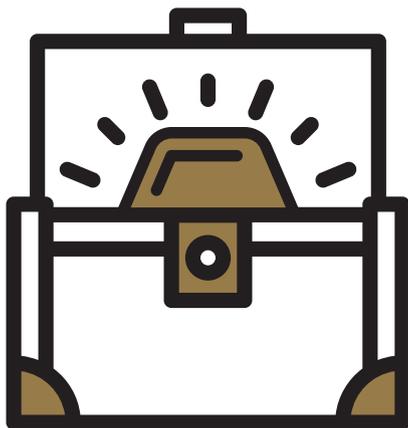
carob seeds, which is how 24 carat became the measure for gold purity. Pure gold is very soft, so metal alloys, such as copper or silver, are typically blended to make jewellery. An 18 carat ring is therefore 18 parts gold and 6 parts another metal; 12 carat gold is 12 parts gold, 12 parts another metal, and so forth.

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World's largest gold bar

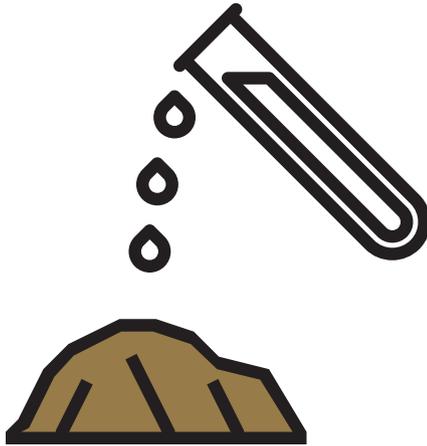
The world's largest gold bar weighs 250 kilograms and was manufactured by the Mitsubishi Materials Corporation. It stands 17 centimetres high, measures 45.5 centimetres by 22 centimetres at its base and is displayed at the Toi Gold Museum in Japan.

The bar's gold content was valued at US\$3.68 million in 2005. It was revalued in October 2014 at around US\$10.33 million.

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The acid test

It's a common phrase used in conversation every day, but few realise 'the acid test' had its beginnings on the goldfields. Meaning 'a sure test', or 'to determine conclusively', the phrase was borne out of the need to distinguish gold from other metals.

Prospectors and dealers would use a drop of nitric acid on a suspect find, which would dissolve metals other than gold more readily. The goldfields drew all sorts of shady characters trying to sell fake gold – 'the acid test' ensured honest dealings.

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Death by gold

Ecuador's Jivaro tribe were so excessively taxed by the Spanish governor in 1599 that they poured molten gold down his throat. It's not the only time gold has proven an effective, albeit brutal, means of execution. The Romans and enforcers in the Spanish Inquisition are also believed to have killed using molten gold.

For fans of *Game of Thrones*, this might explain the inspiration for the molten gold 'crown' used to dispose of Daenerys' brother Viserys.

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Gold bullion ATMs

The first gold bullion vending machine, plated in 24 carat gold, was unveiled at the Emirates Palace Hotel, Abu Dhabi in May 2010. Designed to make ordinary people comfortable investing in gold, the Gold to Go brand now operates more than a dozen ATMs at highly secure locations in seven countries,

including the United Kingdom and the United States. A computer inside the ATM tracks gold prices in real time and prices its products, including gold bars, coins and jewellery, accordingly.

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Rare metal

Gold owes its status as a precious metal to its rarity. In 2014, total gold mined throughout human history was estimated at around 183,600 metric tonnes. Using reasoning applied by Forbes.com, all the gold ever mined could fit in four Olympic-sized swimming pools.

To give further perspective, more steel is poured in one hour around the world than gold has been poured since the beginning of recorded history. Gold may not be the rarest metal – platinum takes that title – but it is the most desirable of the precious metals.

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Ocean of riches

The world's oceans are awash with gold – nearly 20 million tonnes, in fact. But its concentration is so dilute that each litre of seawater contains about 13 billionths of a gram of gold. Undissolved gold deposits also exist in and on the seafloor, but there is no cost-effective way to extract it.

Not that it hasn't been tried. Nobel prize winning chemist Fritz Haber attempted to recover gold from seawater in the 1920s. Unfortunately, he proved more successful at developing chemical weapons than he did recovering gold from the ocean.

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What's in a name?

The chemical symbol for gold is Au, which is derived from the Latin word 'aurum', meaning 'glowing dawn' or 'shining dawn'. Gold takes its name from the Old English word for yellow, 'geolu'. The Aztecs also had a word for gold – 'teocuitatl'.

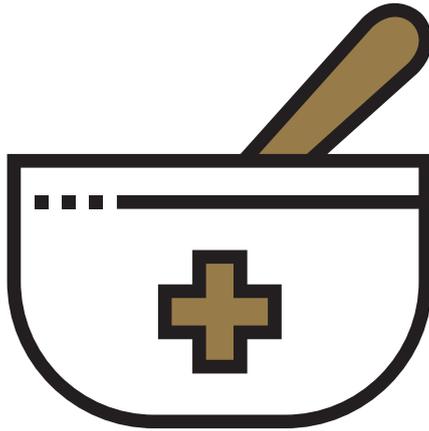
This translated as 'excrement of the gods'. The Aztecs wore brass as decoration, not gold. Gold was valued less than feathers, which was their most valuable currency.

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Ancient alchemy

Across cultures and centuries, gold has been at the centre of the quest for a universal human elixir. The Egyptians believed ingesting gold could purify the body, mind and spirit. For centuries, the Chinese believed gold could cure or prevent everything from small pox to measles. Some rural villagers still

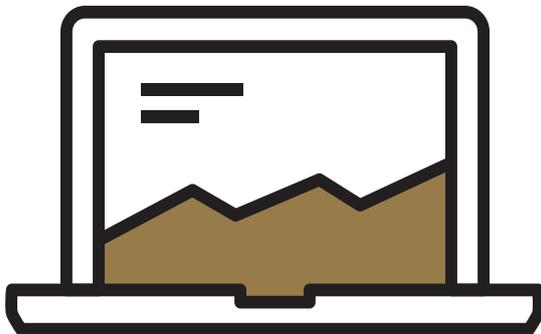
cook their rice with a gold coin to replenish the mineral in their bodies. In medieval Europe, gold pills and baths were popular. Alchemists mixed powdered gold into drinks for patients with sore limbs.

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High tech gold mine

A tonne of personal computers yields more gold than 17 tonnes of gold ore, according to the US Geological Survey. Old electronics, such as printers, mobile phones and cameras, contain gold-plated circuit boards, connectors, sockets, ports and pins. Tech companies are cashing in on this gold mine of their own making by rolling out recycling programs.

Apple's recycling program for old iPhones and iPads reaped the tech giant almost a ton of recoverable gold in 2015, according to its Environmental Responsibility Report. The total value of its haul? Around £28 million.

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Olympic gold

Winning Olympic gold isn't what it used to be. In 1912, the Olympic Committee stopped casting 24 carat gold medals because the financial benefit to the athlete was deemed too great. Gold medals today are required to be coated in just 6 grams of gold.

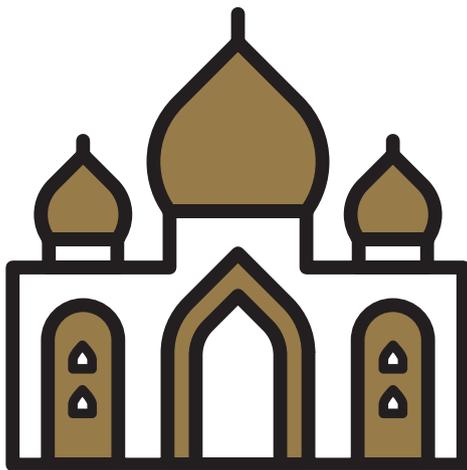
Athletes who won their place on the podium at the Rio Olympic Games took home gold medals containing just 1.2 per cent gold. That's about A\$338 on prevailing gold prices.

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Housewives of India

Households in India hold 11 per cent of the world's gold stock, largely in jewellery and savings. That's about 18,000 tonnes of gold – more than the combined reserves of the United States, IMF, Switzerland and Germany. Macquarie estimated the haul at \$950 billion in its 2011 report, *India's fatal attraction*, around

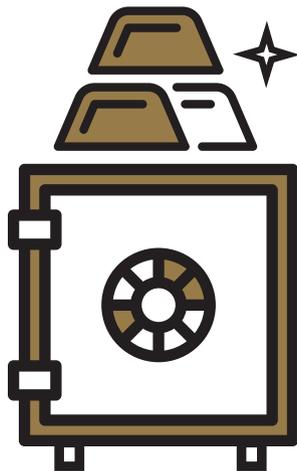
50 per cent of India's nominal GDP in dollar terms. Gold plays an important role in Indian culture. India is the world's largest gold consumer, followed by China.

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Fort Knox

Shrouded in secrecy and protected behind a 25 ton blast proof door lies the gold vault of the United States Bullion Depository at Fort Knox, Kentucky. Lined with granite walls, the vault holds 147.3 million ounces, or 4600 tonnes, of the official gold reserves of the United States, according to the World Gold Council. At a rate of \$1750 an ounce, that makes it worth about \$258 billion.

The world's largest stockpile of gold bullion, however, lies in a vault five stories below ground inside the Federal Reserve Bank of New York. It holds 530,000 gold bars, or 6700 tonnes – around 25 per cent of the world's gold reserve – although belongs largely to foreign governments. At its peak in 1973, the Reserve held more than 12,000 tonnes of monetary gold.

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Golden thread

A single ounce of gold can be beaten into a transparent sheet measuring 9 square metres, or drawn out into a thread or wire 80 kilometres long. That would stretch the span of the Sydney Harbor Bridge almost 70 times!

Gold thread has been used by tailors, dress makers and artisans for centuries, embellishing everything from ancient Chinese courtier robes to medieval tapestries. Pure gold is so malleable it can be molded by hand.

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Earthquakes

Can earthquakes create new gold deposits? The answer is yes, according to Australian researchers Dion Weatherley and Richard Henly. Their 2013 study, published in *Nature Geoscience*, showed a link between gold and quartz seen in many of the world's deposits. Deep below the earth's surface, water

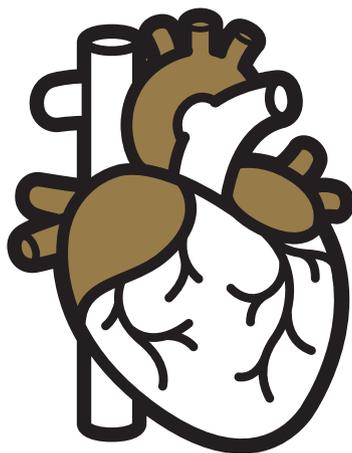
carries high concentrations of carbon dioxide, silica and elements like gold. Rapid depressurisation when smaller secondary faultlines widen during an earthquake can cause the mineral-laden water to crystallise almost instantly. This, they found, can forge tiny gold veins on nearby surfaces.

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Human body

Believe it or not, gold flows through our veins – albeit in very small quantities. Gold is one of the many elements (not least oxygen, carbon, hydrogen and nitrogen) that make up the human body. Fortunately it exists in such small quantities as not to encourage human harvesting. You would need 40,000 people to

reap enough gold to make one 8 gram gold sovereign, for example. A 70 kilogram human contains about 0.229 milligrams of gold; equivalent to a .22 millimetre squared cube. On today's gold prices, that's a return of about 1.2 cents per person.

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