



Beside the seaside

What is sand made from and how do you make the best sandcastle?

Summer is peak sandcastle season for many of us. However, although some stretches of the British coastline are made up of cliffs, rocks or pebbles, many of the most popular beaches are covered in golden sand

– perfect for picnics, playing and building towering palaces with a bucket and spade. What exactly is sand, how is it created and what do we use it for (and does it really contain fish poo?). Read on to find out.

What is sand?



Sand is made up of lots of different things – tiny bits of earth, rock, minerals (materials that naturally form in rocks and earth), seashells and even fish poo. It can take millions of years for these things to turn into sand – the harder the material the longer it will take to become sand. Waves, wind and rain break rocks and earth into smaller pieces. They will eventually be swept to shore and, alongside billions of other grains, become part of a beach. Some white-sand beaches are the work of parrot-fish. These colourful tropical fish use their tiny, superstrong teeth to crunch through dead coral and algae. They poop out undigested ground-up coral as a fine white sand, which builds up to form beaches. White beaches can also be made from materials such as smashed seashells, and different combinations of minerals can create pink, black, red or even green sand.

HOW MANY?
There are an estimated seven quintillion five hundred quadrillion (7,500,000,000,000,000,000) grains of sand on Earth.

What is sand used for?

Humans have used sand throughout history for lots of different purposes, including healthcare, timekeeping, warfare and building. During the Second World War, bags of sand were used to protect people when bombs were being dropped on cities. The sandbags absorbed the shockwaves from explosions and helped to keep people safe. Sand was also used to track time before clocks became widespread and took over. Sand

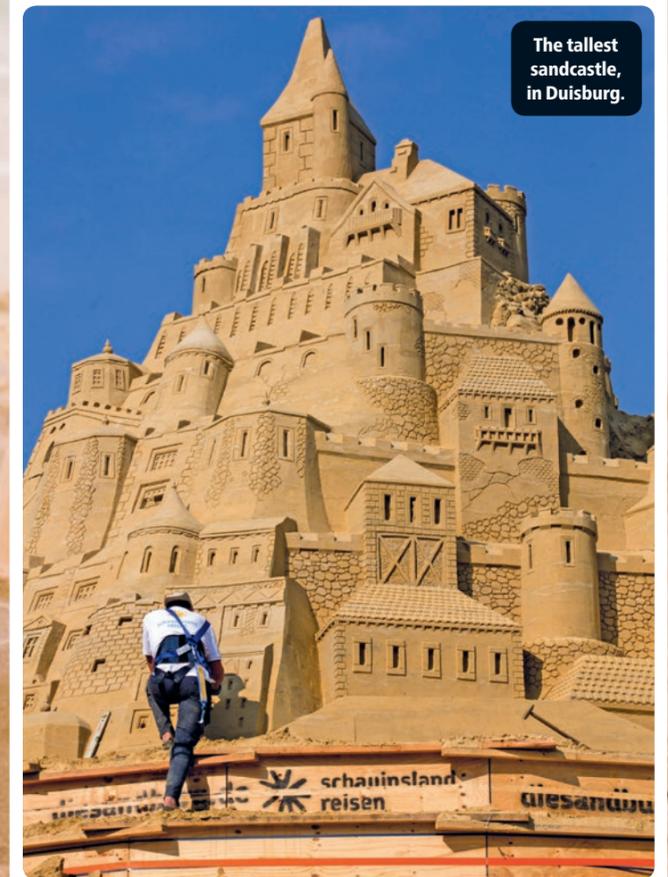
slowly dropping through an hourglass (like a big egg timer) allowed people to see how much time had passed. Evidence dating back to the 8th century shows that French monks used sand clocks to measure time. Today sand is used for lots of things, from filtering water and preventing the spread of disease to making glass. Around 20 billion tonnes of sand are used each year in construction. About half of that goes into making concrete.

An hourglass.



ROCK ON!
Quartz is the most common mineral to be found in sand, as it is found in most types of rock.

The world's tallest and smallest sandcastles



The tallest sandcastle, in Duisburg.

In 2017, the Guinness World Record for the tallest sandcastle was awarded to this huge creation built in Duisburg, Germany. At 16.68 metres tall, the castle was around three times higher than a giraffe. It took almost a month to complete and used up 168 trucks'

worth of sand. Meanwhile, the world's smallest sandcastle was less than half a millimetre long. Using a microscope, artist Vik Muniz engraved the shape of a castle on to a single grain of sand. He wanted to make art so small it "could only be imagined, not seen".

Making art from sand

In several Native American cultures, including that of the Navajo people, coloured sand is trickled on to flat surfaces to create sand paintings, also known as dry paintings. In the UK, Queen Victoria (who reigned from 1837 to 1901) was presented with sand-art gifts made from the colourful sands of Alum Bay in the Isle of Wight. Around the same time, US-based artist Andrew Clemens created intricate artworks by placing different coloured sands in bottles.



Andrew Clemens' art.

How to make the perfect sandcastle

In 2004, a team led by Bournemouth University worked out how to create the best sandcastle. Using samples from 10 British beaches, they found out which sand is best and how much water is needed. The results showed the best castles are built using one bucket of water to every eight buckets of sand. The best sand is made from tiny pieces of shells, as the angular grains lock together to create strong foundations. Finer grains hold more water, which helps glue the castle together.



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