

'Eureka! Eureka!'

'Eureka' is a Greek word meaning 'I found it.' Have you ever had a time when you worked out a puzzle or a question that has stumped you for a while? The answer suddenly dawns on you. That's a 'Eureka!' moment. This is the story of the Greek scientist Archimedes and his 'Eureka!' moment.

Archimedes lived about 2,200 years ago. The king at that time, King Hieron II, wanted to wear a golden crown. One day, he gave a goldsmith a bar of gold and ordered him to make it into a crown. After a few days, the goldsmith gave the finished crown back to the king. The crown was weighed. The weight of the crown was equal to the weight of the gold given to the goldsmith. The king looked at the colour of the crown. He suspected that the goldsmith had swapped some of the gold for a cheaper metal like silver, and stolen the leftover gold.

The king had no way of proving that the goldsmith was a cheat, so he asked Archimedes, the court scientist, to find out the truth. Archimedes spent a long time trying to figure out the answer. He thought about it day and night. One day, he was going to have a bath. He was so busy thinking, he didn't notice that the bathtub was full to the brim. He sat into it. Straight away, a large amount of water flowed over the top of the bathtub. Suddenly, he had a brain wave.

Archimedes knew that different substances of the same weight can take up different amounts of space. For example, a kilogram of feathers takes up more room than a kilogram of butter. He already knew that silver takes up more room than gold. So, if the goldsmith had exchanged a certain weight of the gold for the same weight of silver, the crown would displace more water than an identical crown made of pure gold.

So, to find out the truth, all Archimedes had to do was put the crown in a tub filled to the brim with water and measure the spillage. Then he had to put a gold bar that was exactly the same weight as the one the king gave to the goldsmith in another tub filled to the brim with water. Then he would compare the amount of water in the two spillages. If the goldsmith had indeed made a crown of pure gold, the two spillages should be exactly the same amount.

At that moment in the bath, the answer to the king's problem had suddenly dawned on Archimedes. He was said to be so thrilled with his discovery that he immediately hopped out of the bath and ran as fast as lightning onto the streets, naked, shouting 'Eureka! Eureka!'

And in case you were wondering, the goldsmith later confessed that he had stolen the gold.

