

THE SUBMERGED CROWN

Have you ever wondered how it's possible for ships to float? How can large vessels weighing hundreds of tons float in water without sinking? And what's even more incredible is that throughout history, ships have been getting bigger and heavier, changing from primarily wood, which naturally floats on water, to metal, which normally sinks without much trouble. So, how is it possible?

The answer to this question dates back to ancient Greece, at some point in the 3rd century BC.

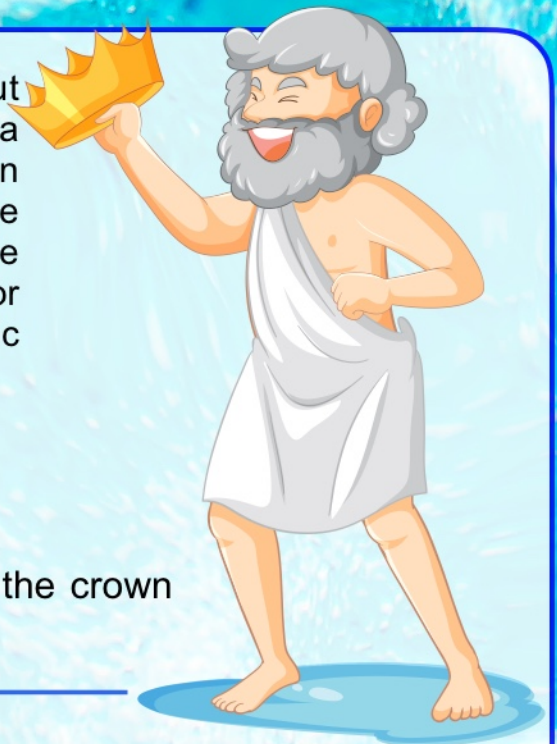
According to legend, King Hieron of Syracuse had commissioned a splendid crown made of pure gold. However, the king was extremely distrustful, so he ordered a cautious search for a goldsmith he could entrust with this task. Once they found one, the king delivered an exact amount of pure gold with the instruction to use it all to make the crown. He warned the worker that they had precisely weighed all the valuable metal they had provided.

A few weeks later, the goldsmith returned to the king with the job done. A brilliant crown of spectacular gold. However, as he didn't trust too much, he ordered the goldsmith to be imprisoned until they made sure the crown was really made of gold. When they weighed it, the result was exactly the same as the gold they had given him to do the job. However, Hieron suspected that he had been cheated and that silver had also been used, hidden inside the crown. So, he called upon Archimedes, a very wise mathematician, with the order to discover whether the crown was really gold or not. But to do so, Archimedes was forbidden to harm the crown because if it was pure gold and he broke it, he would be the one punished.

Archimedes left there very worried, racking his brains to try to figure out how he could prove whether the crown was real or fake, and thus save himself. Unable to think of anything else, the mathematician went home and decided to take a bath to relax, so he filled a tub to the brim and then submerged himself. At that moment, a little water spilled out as Archimedes got in, and it was at that moment that an idea struck him: if the crown was made of pure gold, then he could immerse it in a container of water to the brim and see how much water spilled out (calculate its volume). Then he would repeat the same with the equivalent amount of gold pieces they had given to the goldsmith, and if the water didn't reach the same height, or in other words, didn't have the same volume, then it was fake.



Archimedes' principle states that when you put something in water, the water pushes upwards with a force equal to the weight of the object you're putting in the water. It's as if the water is trying to support the object to keep it from sinking completely. This principle is very useful for understanding why objects float or sink in water, which also helps explain how gigantic metal ships can float in water without sinking.



Comprehension Questions

1.-Where and when in history does the legend of the crown take place?

2.- What was Archimedes' occupation?

3.-How did he come up with the idea to discover if the crown was real or not?

4.- What else is Archimedes' principle useful for?

