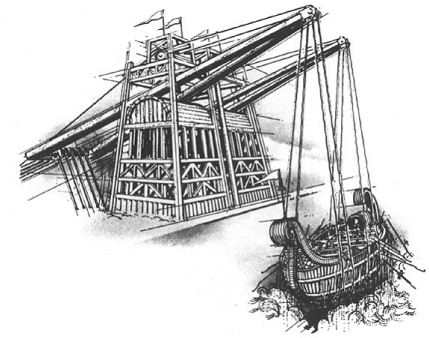
Archimedes

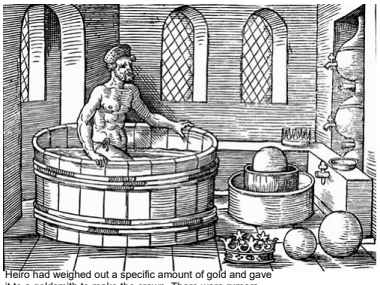
Archimedes Story

Archimedes was born in Syracuse, Greece in 287 BC and died in 212 BC.
Archimedes loved geometry. He explored all kinds of shapes, trying to measure their areas and volumes.



Archimedes tried to work with very large numbers. The Greeks did not have digit symbols like we do and they had no zero. Numbers were represented with letters. It was difficult to do the math that you do easily.
Archimedes invented many items useful to his time. He invented several war machines, and then oversaw and helped with their construction. One of these can be seen to the right. It was known as Archimedes claw. The long ropes would have a claw like attachment on their ends. The operators (it took nearly the entire population of Syracuse to operate the claw) would 'hook' onto an incoming ship and then tip it over, wrecking the ship. When the ships were far from shore, Archimedes would use one of his many types of catapults, to hurl rocks, wood, or other objects at ships.
He also invented a machine, sometimes known as 'the death ray' which harnessed solar power, and could even set ships ablaze. Archimedes created many machines that were well ahead of his time.
When Archimedes was only 22 years old, his cousin Hiero, came to him for help.

Heiro had been elected king of Syracuse after a great battle in which he had led the Syracusans to victory. Heiro felt he should have a golden crown made to show his gratitude to the gods for their assistance with the battle.

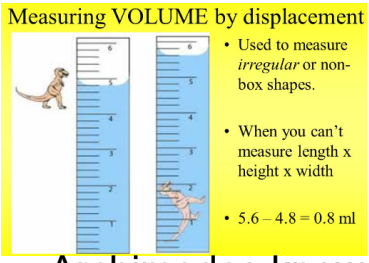


Heiro had weighed out a specific amount of gold and gave it to a goldsmith to make the crown. There were rumors that the goldsmith kept some of the gold. It was said the crown he had made for Heiro was actually made of both gold and silver mixed together. Heiro was very upset by the thought of being cheated.
Archimedes was unsure how to help his cousin at first. He watched the water spill over the sides of the tub when he stepped into the bath and he had an idea! Archimedes noticed that the further his body was in water, the more water poured over the sides of the tub. He knew how to solve Hiero's problem.
It is said, Archimedes was so excited by his discovery that he jumped right out of the bath, and ran home without even dressing. He shouted, 'Eureka, Eureka!' which is Greek for, 'I have found it! I have found it!'
He had discovered a way to measure the volume of an irregularly-shaped object. He found that an object, when submerged in water, displaced a volume of water equal to its own volume. By measuring the volume of the displaced water, the volume of the object could be determined, regardless of the its shape. We now know this discovery, relating to water displacement and buoyancy, as Archimedes principle.
Archimedes could measure the volume of the crown by measuring the volume of the water spilled when the crown was submerged in water. He compared this to the amount spilled with the same weight of pure gold.

He proved the rumors to be correct - Hiero had been cheated by the goldsmith.

When Archimedes was 75, Syracuse was captured by the Romans. It is said Archimedes was so deep in thought when approached by a Roman soldier, he was killed by the soldier for ignoring him.

Without Archimedes our world might possibly be a very different. He was once quoted as saying "Give me a lever long enough and a fulcrum on which to place it, and I shall move the world." Archimedes has inspired many people and many technologies.



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Archimedes knew that the desity of the crown had to match the density of the gold. ($D = \frac{mass}{volume}$)

- the mass of the crown was easily measured with a balance
- Volume was measured with displace water

Archimede's Principle

Archimedes Principle: Explained in Really Simple Words - YouTube

When an object is places in a fluid, the object displaces some of the fluid because of the force of gravity pulling down on the object.

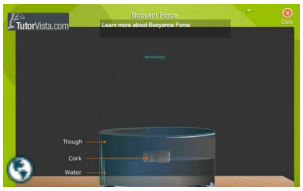
1) The volume of the object equals the volume of fluid that it displaces.

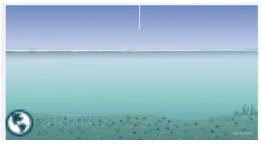
2) The buoyant forces acting on an object submerged in a fluid equals the weight of the fluid displaces by th object.

see next page

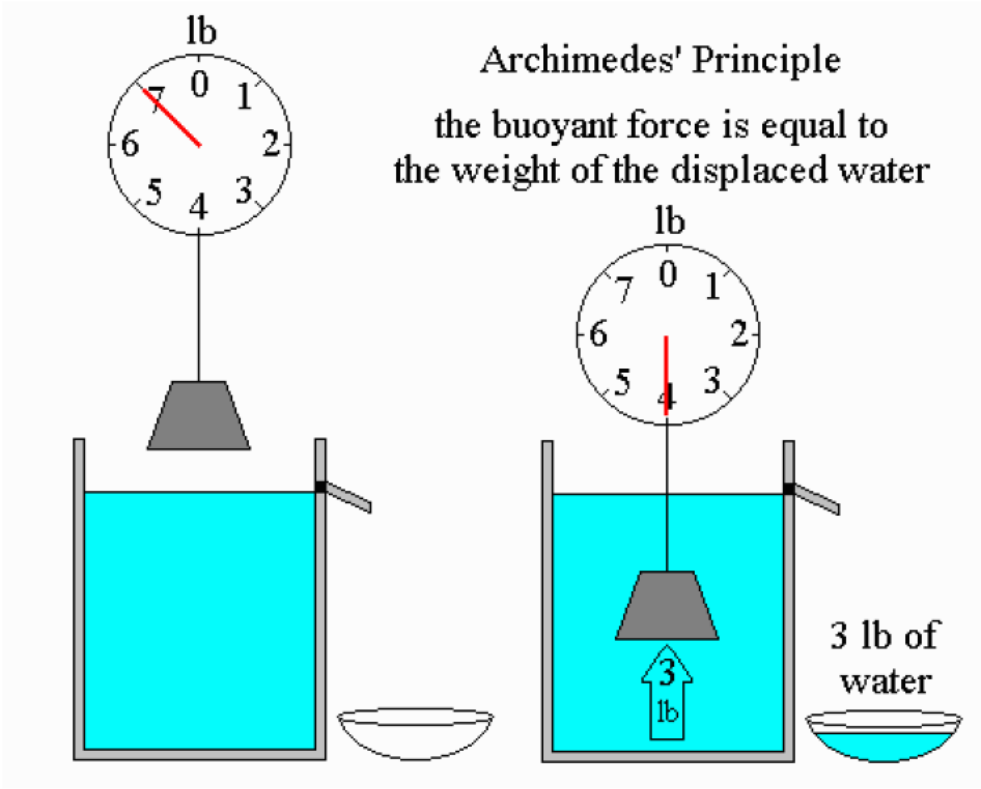
Archimedes took it further..

Archimedes principle & buoyancy | fluids | Physics | Khan Academy - YouTube





"When an object is immersed in a liquid the apparent loss of weight of an object is equal to the upthrust and this is also equal to the weight of the liquid displaced".



Attachments

Archimedes story.docx