**Archimedes**

Archimedes of Syracus (287 BC-212 BC) was a Greek mathematician, physicist, engineer, inventor and astronomer. He is regarded as one of the leading scientists in classical antiquity. He anticipated modern calculus and analysis by applying concepts of infinitesimals and the method of exhaustion to derive and prove a range of geometrical theorems, including the area of circle, the surface area and volume of a sphere, and the area under a parabola. Here are some of the ideas and inventions that have been attributed to him.

**The Archimedes Principle**

Archimedes wrote in his treatise “On Floating Bodies” that an object submerged in fluid experiences a buoyant force equal to the weight of the fluid it displaces. The famous anecdote for how he came up with this was started when he was asked to determine if a crown was pure gold or contained some silver. While in the bathtub he arrived at the principle of displacement by weight and ran through the streets naked shouting "Eureka (I have found it)!" A crown with silver would weigh less than one that was pure gold, Weighing the displaced water would allow calculation of the density of the crown, showing whether or not it was pure gold.

**The Archimedes Screw**

The Archimedes screw, or screw pump, is a machine that can raise water from a lower to higher level. It is useful for irrigation systems, water systems, sewage systems and for pumping water out of a ship's bilge. It is a screw-shaped surface inside a pipe and has to be turned, which is often done by attaching it to a windmill or by turning it by hand or oxen. [The windmills](https://www.thoughtco.com/pros-and-cons-of-wind-power-1204181) of Holland are an example of using the Archimedes screw to drain water from low-lying areas. Archimedes may not have discovered this invention since there is some evidence they existed for hundreds of years before his life. He may have observed them in Egypt and later popularized them in Greece.

**War Machines and Heat Ray**

Archimedes also designed several claw, catapult, and trebuchet war machines for use against the armies laying siege to Syracuse. The author Lucian wrote in the second century AD that Archimedes used a heat-focusing device that involved mirrors acting as a parabolic reflector as a way to set invading ships on fire. Several modern-day experimenters have attempted to show this was possible, but have had mixed results. Sadly, he was killed during the siege of Syracuse.

**Principles of the Lever and Pulleys**

Archimedes is quoted as saying, "Give me a place to stand on and I will move the Earth." He explained the principles of levers in his treatise “*On the Equilibrium of Planes*.” He designed block-and-tackle pulley systems for use in loading and unloading ships.

**Planetarium or Orrery**

Archimedes even built devices that showed the movement of the sun and moon across the sky. It would have required sophisticated differential gears. These devices were acquired by General Marcus Claudius Marcellus as part of his personal loot from the capture of Syracuse.

**An Early Odometer**

Archimedes is credited with designing an odometer that could measure distance. It used a chariot wheel and gears to drop a pebble once per Roman mile into a counting box.

Archimedes died during the Second Punic War ,when Roman forces captured the city of Syracuse. When the city was captured, Archimedes was contemplating a mathematical diagram and denied to follow the Roman soldier’s orders. The last words attributed to Archimedes are ‘Do not disturb my circles’, a reference to the circles in the mathematical drawing that he was studying.