That there are the three physical theories in common use is partly due to historical reasons, partly due to their relative ease of use, and partly due to the range of phenomena that must be described.

Newtonian mechanics was the first comprehensive theory, and incorporates gravity as a force. It is intuitive, based as it is on ideas of absolute space and time and Newton's three laws of motion. Newton conceived of space as a rigid three dimensional coordinate system whose axes stretched to the ends of the universe. Time flowed at the same rate for all time throughout the whole of space, and the properties of neither space nor time were changed by the presence of matter or motion.

Important concepts in Newtonian mechanics were inertial frames and the principle of relativity. An inertial frame is a non accelerating observing system. Observations made in different inertial frames are related via the Galilean transformation.

$$x' = x - Vt$$
$$u' = u - V$$
$$a' = a$$
$$t' = t$$

The principle of relativity states: All inertial frames are equivalent. Symmetry begets symmetry.