

Galileo's Second New Science

"Local Motion"

I.e. uniform motion, naturally accelerated motion, violent projectile motion

Relevant parameters, in absence of a resisting medium:

distance, height of descent or ascent, time, speed

Irrelevant parameters, in absence of a resisting medium:

weight, shape, density, density of resisting medium

Basis for claim:

- (1) "Thought experiments" – e.g. *Discorsi*, [108]
- (2) While the heavier of two bodies in vertical fall almost always reaches the ground sooner, the times and hence the speeds are not proportional to the weights of the bodies; and as the heavier the two bodies are, the less the difference in their times of fall
- (3) The effects of resistance on a falling body are smaller the less the density of the medium, suggesting they disappear entirely with zero density
- (4) Two 5 braccia pendulums, one with a cork bob and the other with a lead bob, remain synchronous, with equal periods, even though resistance affects former more