



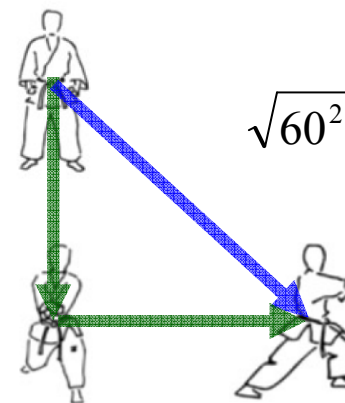
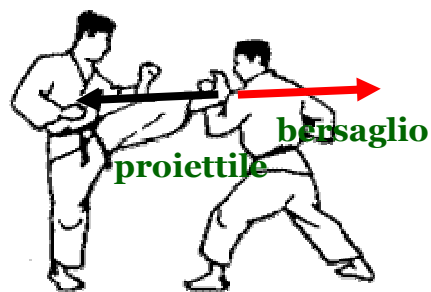
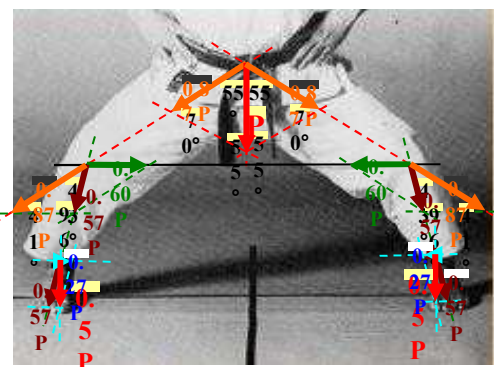
La Fisica del Karate

studio delle leggi della Fisica applicate alle tecniche di Karate

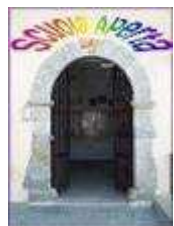


Physics of Karate

Daide Ialacqua e Simone Gianino



$$\sqrt{60^2 + 60^2} \cong 85 \text{ cm}$$





Physics

Physics studies natural phenomena

In our school we study Physics from the first to the fifth year

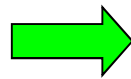
1st year	2 hours	Mechanics
2nd year	2 hours	Mechanics and Optics
3rd year	3 hours	Mechanics, Thermodynamics
4th year	3 hours	Thermodynamics, Waves, Electrostatics
5th year	3 hours	Electromagnetism and modern Physics



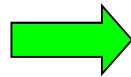
II KARA-TE-DO



空
手
道



Kara-Te
(*empty hand*)



Do
(*the path of life*)

The *Karate* is a martial art that began in the Okinawa island making reference to the Chinese Kung Fu.

It developed in the early 17th century when the Japanese occupied the island and banned the use of all weapons and all sorts of fights. In the 20th century, thanks to Gichin Funakoshi, Karate was acknowledged as a National Japanese martial discipline.

Today karate-do is one of the many methods that help us to know our body better, to improve our own character and our self-control.

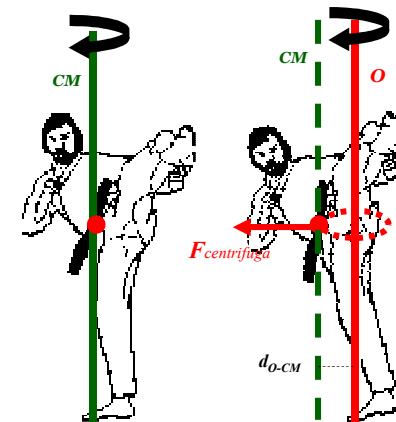
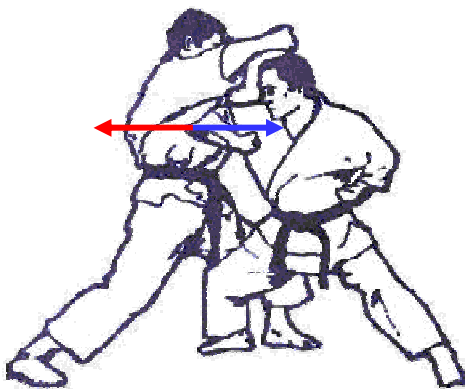




Physics of Karate

Study of the Physics laws applied to karate techniques, trying to understand how karate works

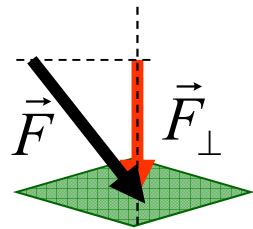
*This is a didactic project aiming at developing the critical sense by spotting and checking experimentally the laws and principles of Physics involved in the actions of our body.
The method used is “to do” in order “to learn”*





Pressure

The **pressure** is the force per unit area applied in a direction perpendicular to the surface of an object. The I.S. unit for pressure is the pascal (Pa), equal to one Newton per square meter



$$p = \frac{F_{\perp}}{S} \rightarrow Pa = \frac{N}{m^2}$$

Other non-IS units of measurement are:

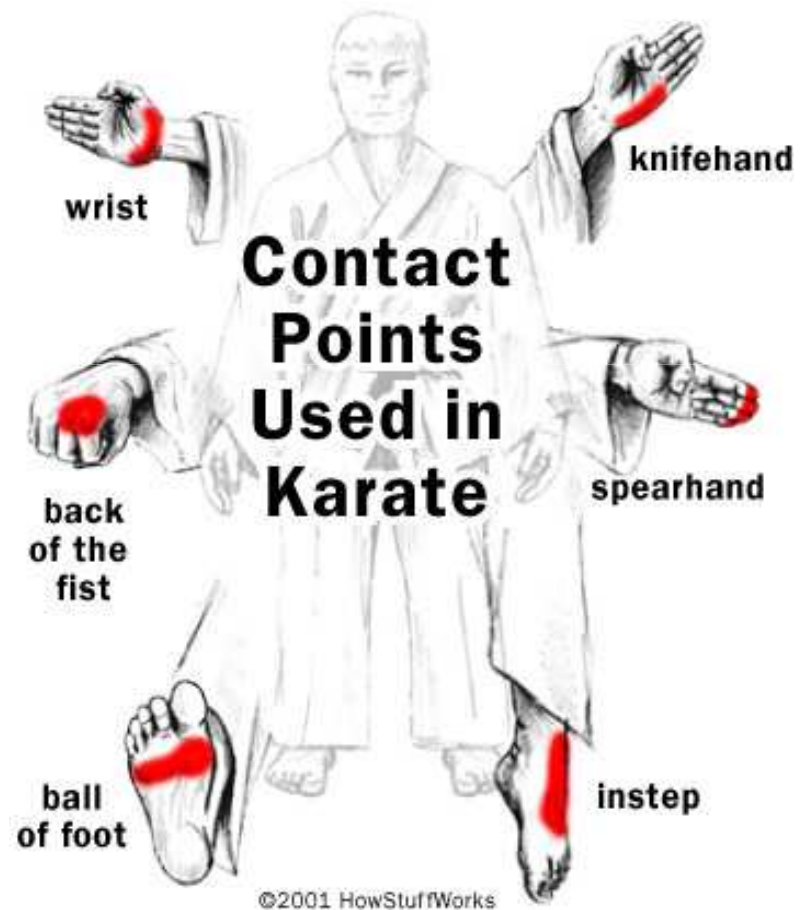
$$atm = 101300 Pa; \quad bar = 100000 Pa; \quad mmHg = 133.3 Pa$$



Pressure and Karate

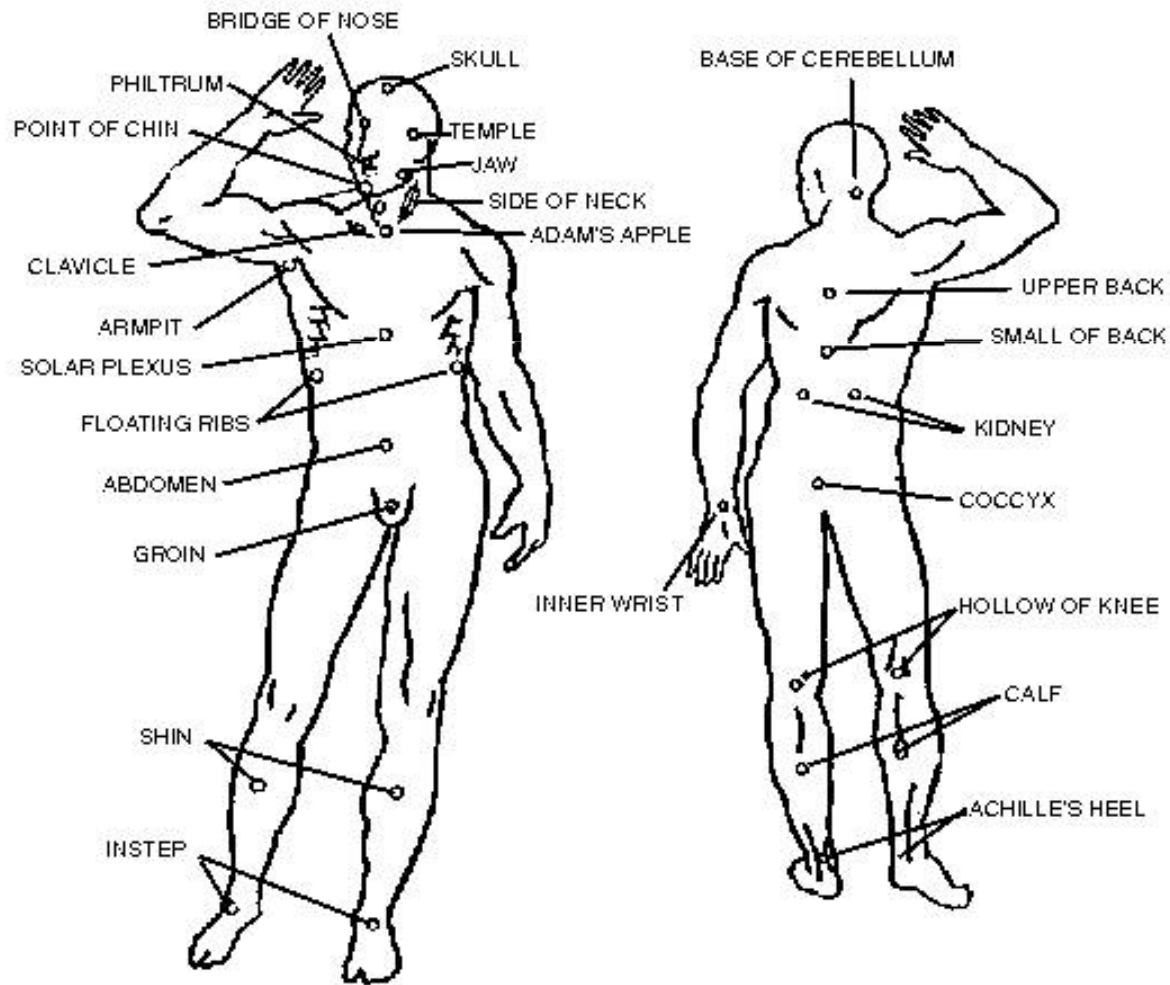
*To produce great effects, we need that the **surface of impact** is the smallest possible and that the hit is inflicted with a part of the human body that is able to bear the produced pressure.*

(principle of action and reaction)



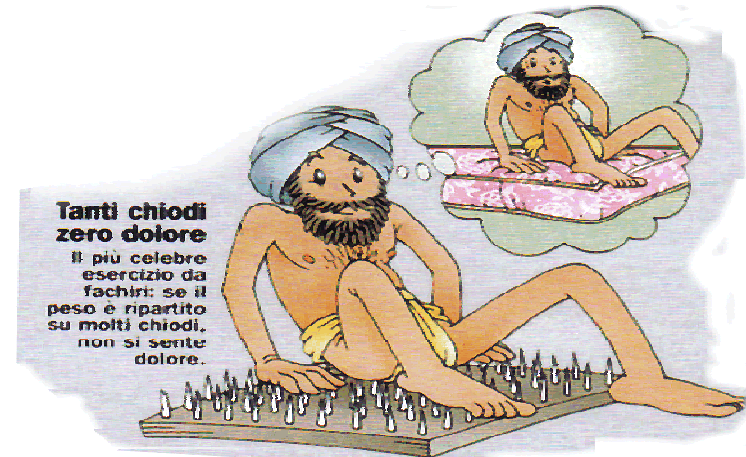


The most vulnerable points in our body





Pressure is the fakirs' most famous secret



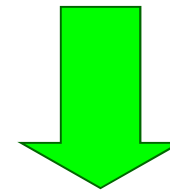
The ability of fakirs to lie down over a nail carpet is not something magic, it's just a Physics law: if your weight is distributed on many nails, you don't feel any pain!



Threshold of pain and ...



Threshold of pain = $(300 \div 1000) \text{ g}$



If we set the nails at a distance of 1 cm, we'll have about 1000 nails under our body, with a weight for each nail corresponding to a mass of about **70-90 g for every nail.**



... « fakirs »

