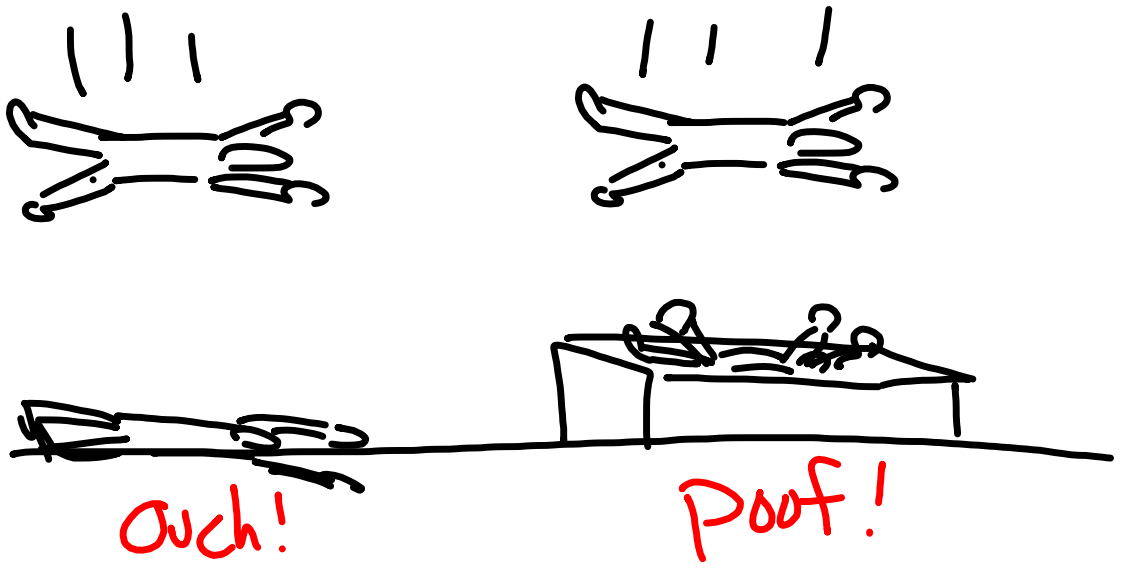
What is the secret of a safe landing?



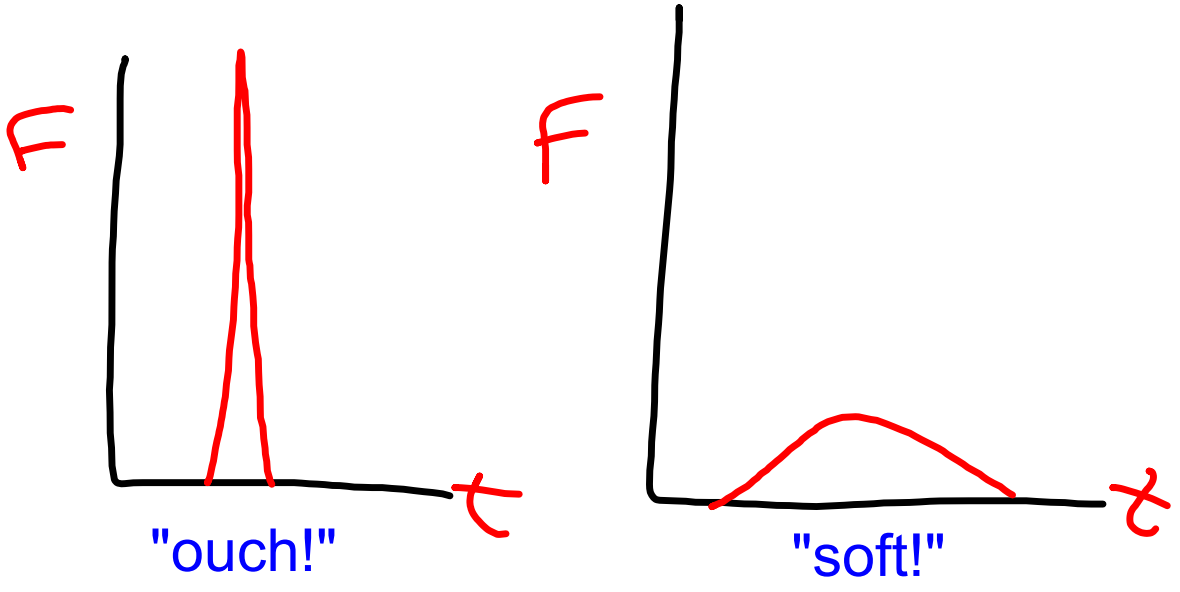
"Absorbs the force"

Don't say it. It's a bad analogy.

Force is not water and padding is not a sponge.

But force might be a good thing to look at.

Same object stopped from the same speed



Is there something the same?

Better:

"More time to stop means less force"

The key to a safe stop is to extend the time of impact.

More generally,

Both force and time are important for how effective a collision is in changing the motion of an object.

So a small force over a long time

can be just as effective as

A large force over a short time.

Lets define something to capture that idea:

Impulse = Ft

How effective a collision is in changing the motion of something.

The Forgotten Factor: Time

F x t

Short Time
Big Force

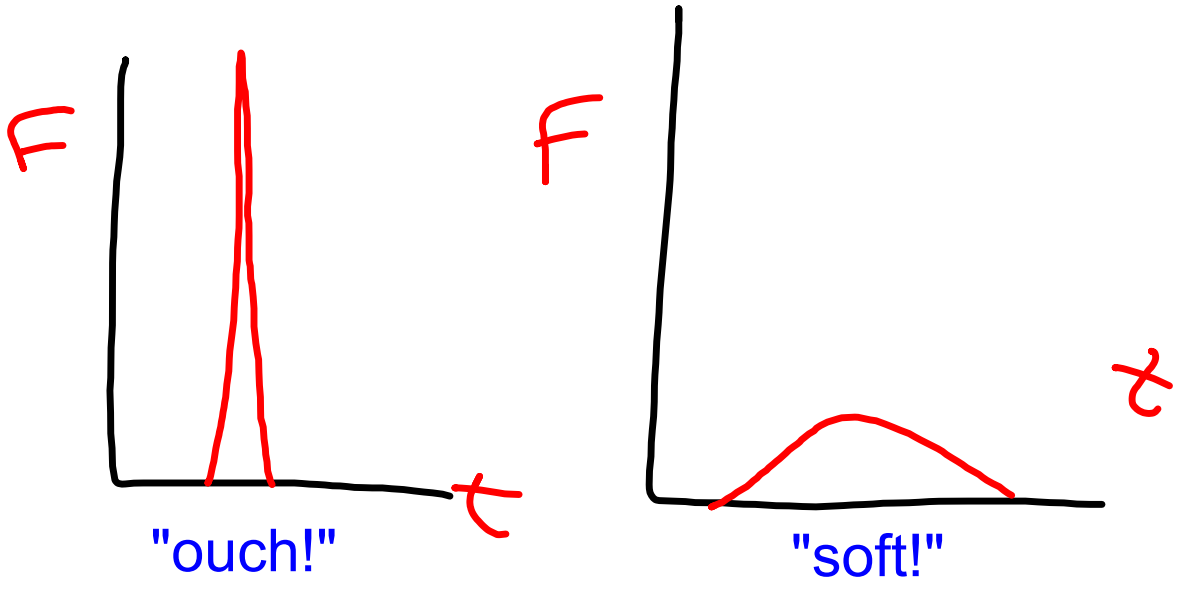
F x t

Long Time
Small Force

Same impulse: Same effectiveness in the collision

Same object stopped from the same speed

Impulse = Ft



But forces aren't constant in a collision.

THE AREA IS!

So Impulse is handy as a way to think about things, but not so handy for calculating, except as proportions.

Impulse = Ft

Example: Doubling the time in a collision should mean half the force

(all other things remaining the same).