

Corpos sobre apoio horizontal

- Aula 16 / Apostila 2 / Pg. 332

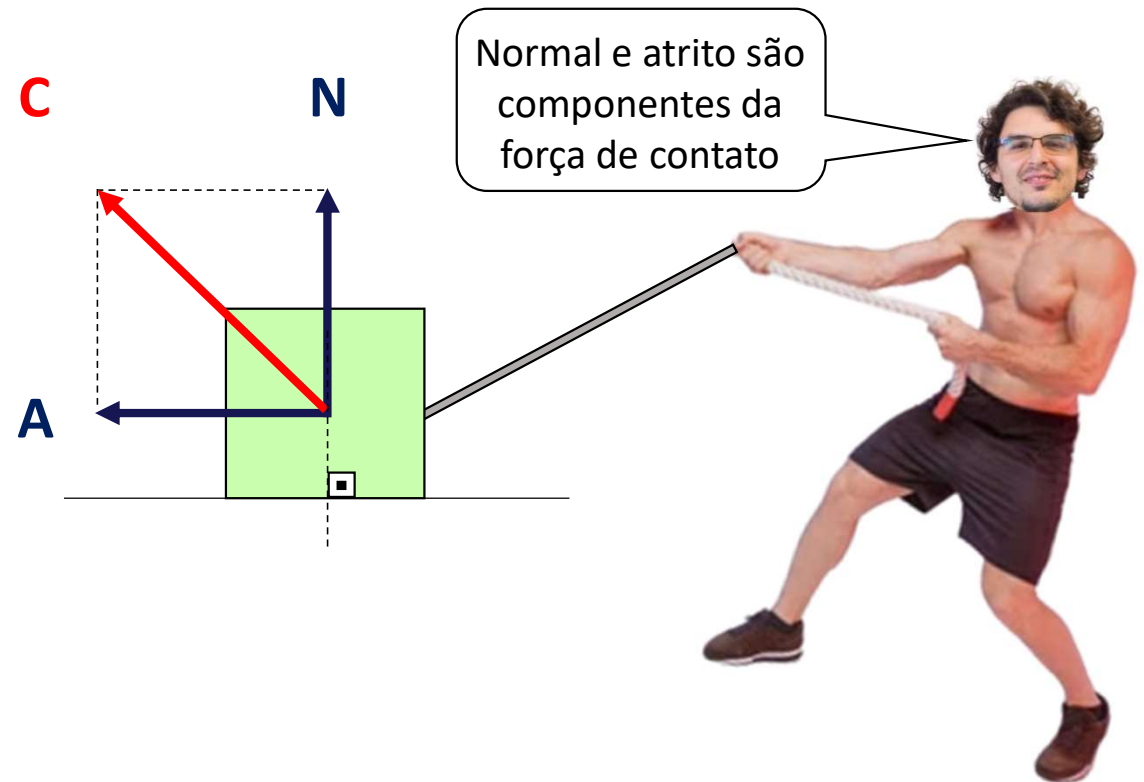
Apresentação e demais documentos: fisicasp.com.br

Professor Caio – Física / Setor A

Força de contato (\vec{C})

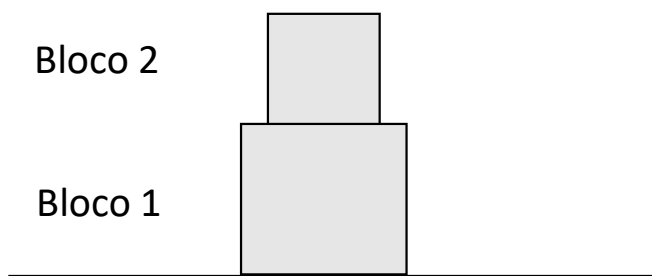
Normal (\vec{N})

- **Conceito:** impede a penetração
- **Direção:** perpendicular à superfície de apoio
- **Sentido:** contrário à tendência de penetração
- **Condição:** tentativa de penetração



Exemplo 1:

Corpos em repouso $\rightarrow R = 0$



Bloco 2



Bloco 1



Chão

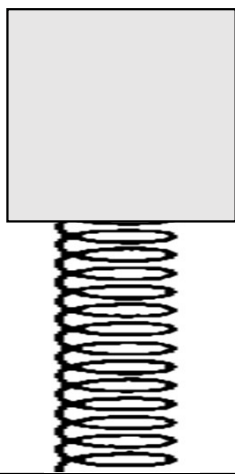


Terra



Exemplo 2:

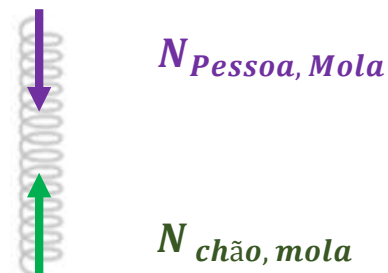
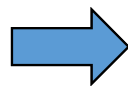
Corpos em repouso $\rightarrow R = 0$



2. Dinamômetro de compressão (balança de banheiro)



Balança de banheiro
(Dinamômetro de compressão)



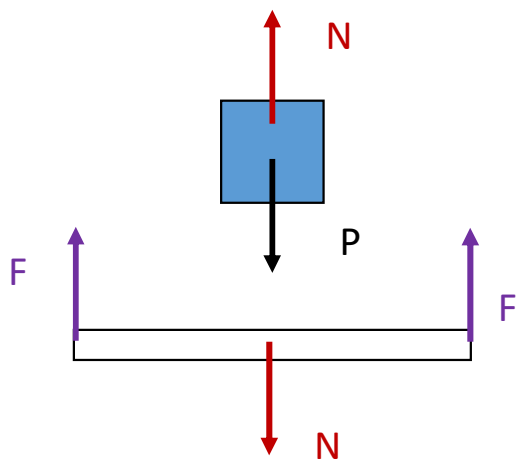
$$N \rightarrow F_{el}$$

$$F_{el} = k \cdot x$$

O dinamômetro de compressão indica a intensidade da normal aplicada sobre ele



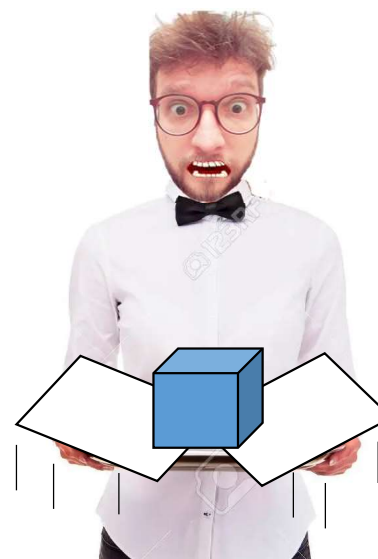
A normal pode ter intensidade diferente do peso



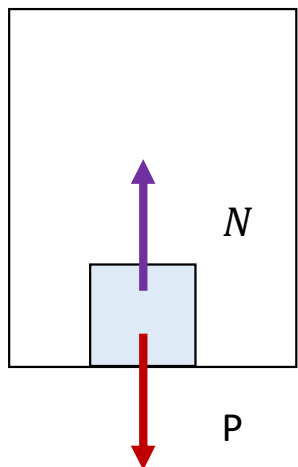
Basta que o Caio empurre a placa para cima bruscamente



A intensidade da normal aumenta e a placa quebra!



Exemplo 3: elevador



$$|\vec{\gamma}| = |\vec{a}_t| = |a| = 2 \text{ m/s}^2$$

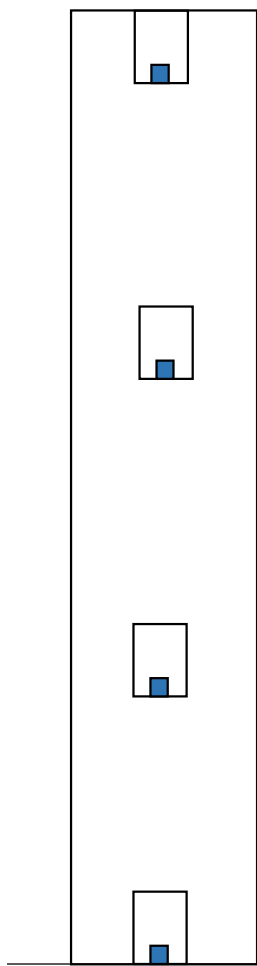
$$m = 100 \text{ kg}$$

$$g = 10 \frac{\text{N}}{\text{kg}}$$

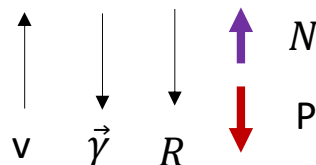
$$P = m \cdot g = 1000 \text{ N}$$

$$R = m \cdot |a|$$

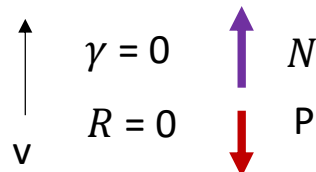
Subida



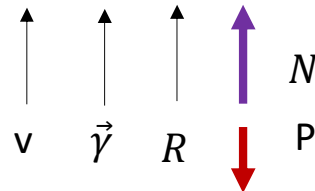
MRR



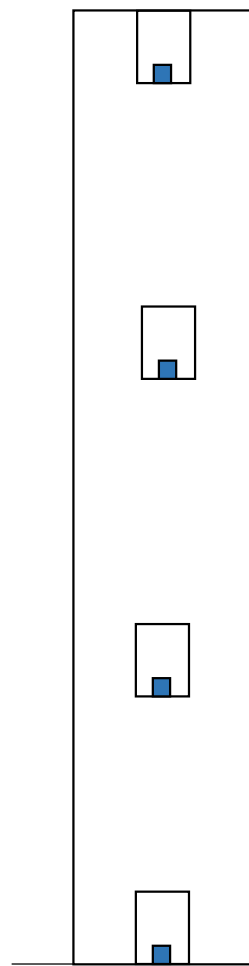
MRU



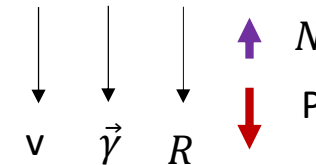
MRA



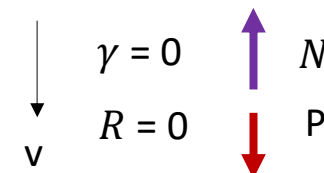
Descida



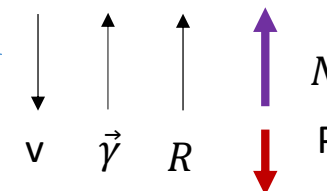
MRA



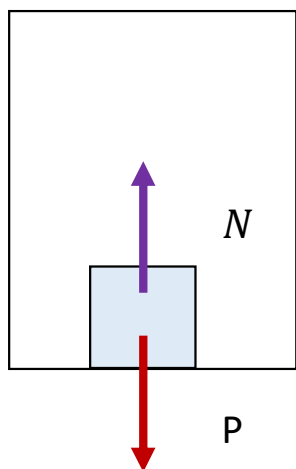
MRU



MRR



Exemplo 3: elevador



$$|\vec{\gamma}| = |\vec{a}_t| = |a| = 2 \text{ m/s}^2$$

$$m = 100 \text{ kg}$$

$$g = 10 \frac{\text{N}}{\text{kg}}$$

$$P = m \cdot g = 1000 \text{ N}$$

$$R = m \cdot |a|$$

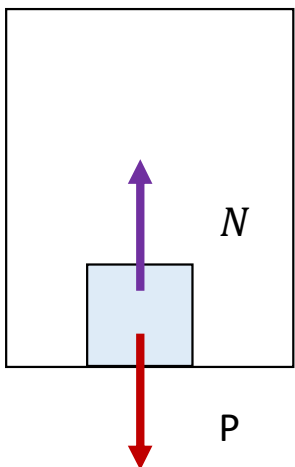
1. Repouso no t rreo

3. MRU (subindo)

2. MRA (subindo)

4. MRR (subindo)

Exemplo 3: elevador



$$|\vec{\gamma}| = |\vec{a}_t| = |a| = 2 \text{ m/s}^2$$

$$m = 100 \text{ kg}$$

$$g = 10 \frac{\text{N}}{\text{kg}}$$

$$P = m \cdot g = 1000 \text{ N}$$

$$R = m \cdot |a|$$

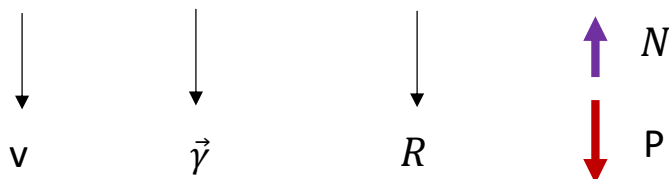
5. Repouso no último andar

$$v = 0 \quad \gamma = 0 \quad R = 0$$



$$N = P = 1000 \text{ N}$$

6. MRA (descendo)



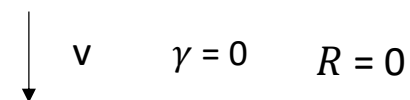
$$P - N = m \cdot |a|$$

$$1000 - N = 100 \cdot 2$$

$$1000 - 200 = N$$

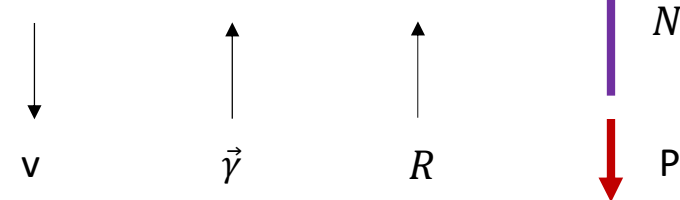
$$N = 800 \text{ N}$$

7. MRU (descendo)



$$N = P = 1000 \text{ N}$$

8. MRR (descendo)



$$N - P = m \cdot |a|$$

$$N - 1000 = 100 \cdot 2$$

$$N = 1200 \text{ N}$$

$$N > P$$

$$R = N - P$$