

Gravity and Balance

Newton's Toy Box Activity 2

gravity, gravity support force, newton, pound, weight

What forces are acting on you right now?

One of the forces acting on you is gravity.

Gravity is the force pulling objects toward the center of Earth.

But you're not falling, because there is a force opposing gravity-the **gravity support force**.

Force Diagram

gravity force
(downward)

gravity
support
force
(upward)

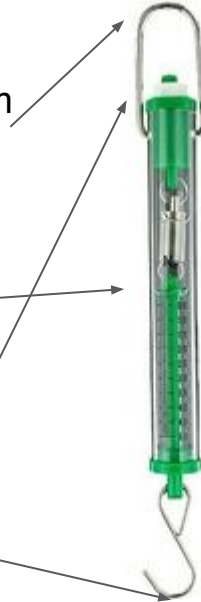
- equal length arrows indicate equal/balanced forces
- direction of the arrows indicate direction of the force



Using a Spring Scale

A spring scale measures force in newtons (N).

- Hold the spring scale from the top.
- Make sure the area you are reading a measurement from is at eye level.
- Zero out the scale using the screw at the top.
- Attach the object to the hook.
- Make sure the spring scale and object are not touching the table.
- Know what the measurement values are.



Newton's and Pounds

Weight is the strength of gravity force pulling down on an object.

It is measured in **newtons** (N) in the metric systems and **pounds** (lb) in the US customary system.

$$1\text{N}=0.225\text{ lb}; 1\text{lb}=4.45\text{N}$$

Converting Newtons and Pounds

$$1\text{N}=0.225\text{ lb}; 1\text{lb}=4.45\text{N}$$

Since $1\text{ lb} = 4.45\text{ N}$,

a 100 lb person weighs 445 N

(because $100 \times 4.45 = 445$)

How many N does a 150lb person weigh?

Converting Newtons and Pounds

How many N does a 150lb person weigh?

$$1\text{N}=0.225 \text{ lb}; 1\text{lb}=4.45\text{N}$$

Since $1 \text{ lb} = 4.45 \text{ N}$,

a 150 lb person weighs 667.5 N

(because $150 \times 4.45 = 667.5$)