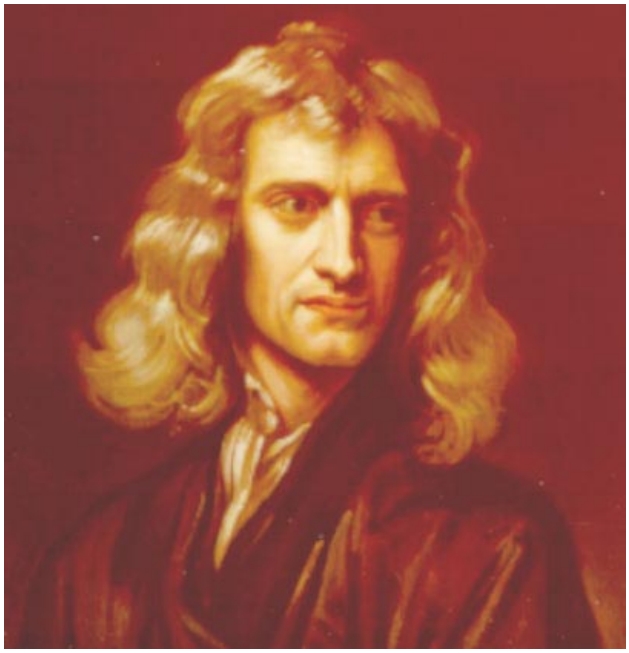


**Isaac Newton**

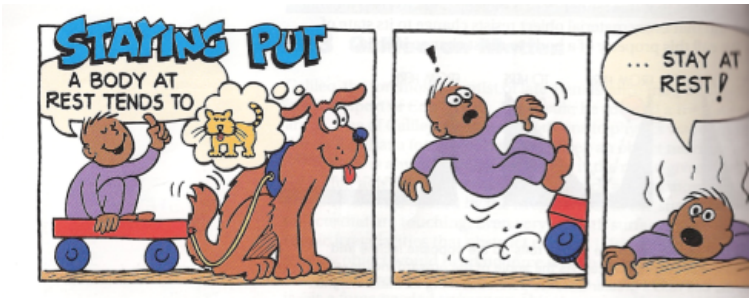
Oct 1-7:18 PM

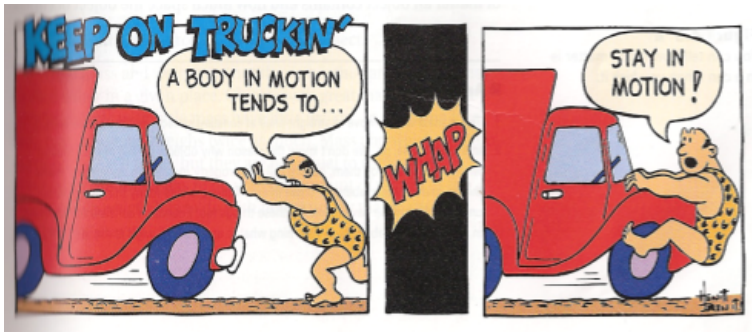
First Law of Motion

Inertia

An object continues in a state of rest, or of motion in a straight line at constant speed, unless it is compelled to change that state by forces exerted upon it.

Oct 1-7:21 PM




Sep 22-7:42 PM

Mass -

A Measure of the inertia of an object

Mass vs. Volume

Inertia vs Space occupied

Mass vs. Weight

Inertia vs Force of Gravity on an object

Oct 8-5:24 PM

## Mass vs. Weight

Inertia vs Force of Gravity on an object

The force of gravity is proportional to the mass but the proportionality constant depends upon the location.

Relative Gravities

Mercury- .378
Venus- .907
Earth - 1
Mars- .377
Jupiter- 2.364
Saturn- .916
Uranus- .889
Neptune- 1.125
Pluto (not a planet)- .067
Moon- .166
Sun- 27.551

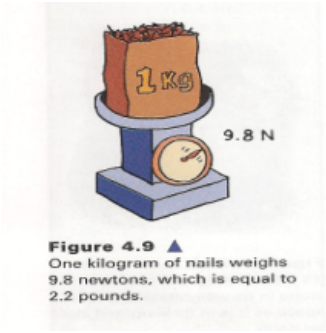



**Figure 4.9** ▲
One kilogram of nails weighs 9.8 newtons, which is equal to 2.2 pounds.

In space the rock has no weight but it still has the same inertia.

Oct 8-5:24 PM

1 kilogram weighs 9.8 Newtons
1 kilogram weighs 2.2 pounds

The Newton - Force (Metric System)

The Pound - Force (British System)

Net Force - Vector Sum

Equilibrium

Which weighs more a pound of lead or a pound of feathers?

Oct 8-5:24 PM

1. Would a 2 kilogram piece of lead have
   a. twice as much mass as a 1kilogram piece of lead?
   b. twice as much inertia at a 1 kilogram piece of lead?
   c. twice as much weight as a 1 kilogram piece of lead
      (assuming they were weighed at the same location)
   d. twice as much volume as a 1 kilogram piece of lead?

2. Compare 2 kilograms of bananas to 2 kilograms of bread
   a. in terms of how much Mass is each has
   b. in terms of how much inertia each has
   c. in terms of how much volume each has
   d. in terms of how much weight each has

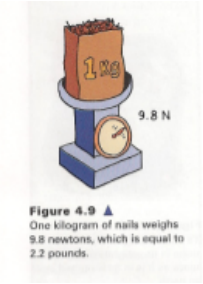


Figure 4.9 ▲
One kilogram of nails weighs 9.8 newtons, which is equal to 2.2 pounds.

Sep 27-9:36 AM

Explain in terms of weight AND ALSO in terms of mass.

What happens when you lift the sledgehammer?
What happens when you stop lifting the sledgehammer?
What happens when you bring it down?

Sep 25-6:12 PM

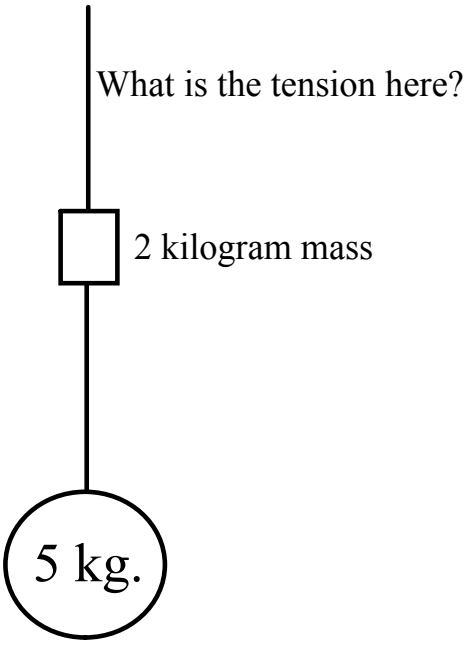
Questions:

- What is the effect of friction on a moving object?
- The speed of a ball increases as it rolls down an incline and it decreases as it rolls up an incline. What happens to the speed if it rolls on a horizontal surface?
- Inertia says that no force is required to maintain motion. Why, then, do you have to keep pedaling your bicycle to maintain motion?
- A space probe was launched toward Jupiter. How much force is necessary to keep it moving?

Oct 8-5:30 PM

- What is the weight of 2 kilograms of iron?
- Forces of 10 N and 4 N act in opposite directions. What is the magnitude of the resultant force?
- What is the weight of a 2.5 kilogram object (in Newtons)?
- In the cabin of a jetliner that cruises at 600 km/hr, a pillow drops from an overhead rack into your lap below. Since the jetliner is moving so fast, why doesn't the pillow slam into the rear of the compartment when it drops?

Oct 8-5:33 PM




Oct 8-5:37 PM

Sep 22-7:50 PM