Newton's 3 Laws

What is the 1st law of motion?

Law # 1

What is the 2nd law of motion?

Law # 2

What is the 3rd law of motion?

Law # 3

motion ? Acceleration

Isaac who?

Born: Died:

Lived in:

Studied at:

Accomplishments:

Physics

Which Law?

A rocket pushes burning gases **DOWN**, which causes the rocket to launch **UP**

① ② ③

A sports car **speeds up much faster** than a dump truck when a traffic light turns from red to green.

① ② ③

A skateboarder pushes the ground **backward** which causes the board to move **forward**.

① ② ③

When a mule **stops** suddenly, the packages on its back **continue moving** forward onto the ground.

① ② ③

It is **much more difficult to move** a dresser **full** of clothes than an empty dresser.

① ② ③

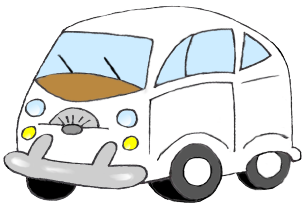
A book sitting on the table does not move.

① ② ③

Mass

Force

Cars use all three of Newton's laws of motion. Pick one law and describe how a car uses the law. Label the picture below to show the law in action.



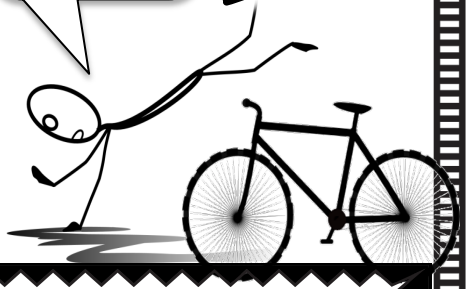
Action

Reaction

Gravity

#1 Law

I fought the law, and the law won.



An object in motion _____ in motion

An object_____ _____stays at rest.

UNLESS acted upon by an _____

F O R C E!

motion

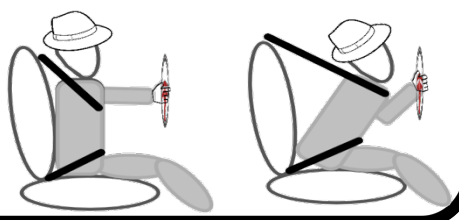
What is inertia?

Give an example of inertia in your daily life.

A man forgets that he set his coffee cup on top of his car. He starts to drive and the coffee cup rolls off the car onto the road. How does this scenario demonstrate the first law of motion? Be specific and use the words from the law in your answer.

Answer

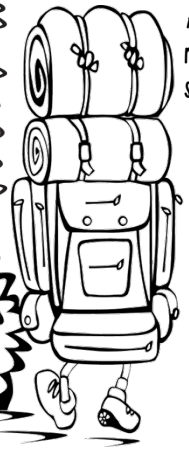
How do seatbelts relate to the first law of motion?



Force

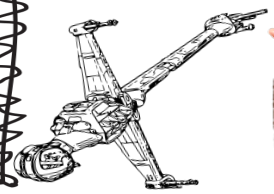
#2 Law

Motion



A mountain climber packs too much gear and finds it difficult reach the summit before a storm blows in. How does this scenario demonstrate Newton's 2nd Law?

May the FORCE be with you always.



What is the definition of force?

Draw a picture of a force:

force

=

What is the definition of mass?

Draw a picture of mass:

mass

x

What is the definition of acceleration?

Draw a picture of acceleration:

acceleration

Mass

Solve it!

Example: How much force is needed to accelerate 1500 kg at a rate of 2 m/s/s?

Write the formula → F = m x a
fill in the data → F = 1500 kg x 2 m/s/s
Solve! → F = 3000 N

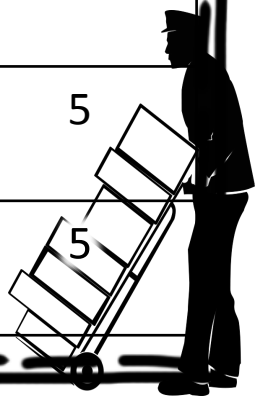
Now you try it!

How much force is needed to accelerate 300 kg at a rate of 4 m/s/s? (Show your work please.)

A shipping company is calculating the force, mass and acceleration of it's freight to ensure that they don't overload their trucks. Help them by filling in the missing data

force = mass x acceleration

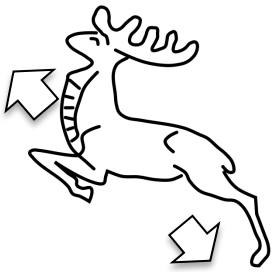
(N)	(Kg)	(m/s/s)
?	200	5
1500	?	5
?	400	5
2500	?	5

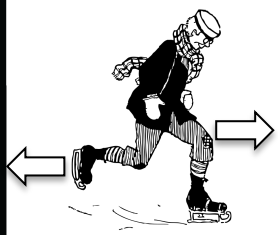


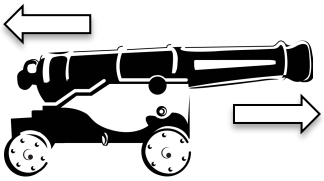
Force

#3 Law

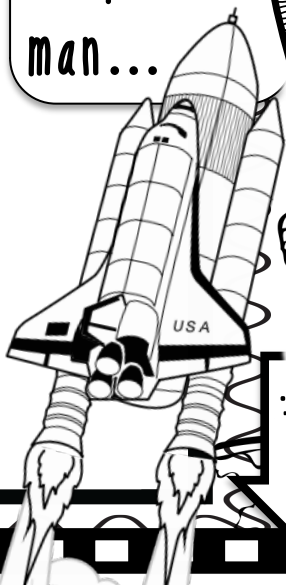
Look closely at the two forces in each picture. Label the action force with an (A) and the reaction force with a (R)

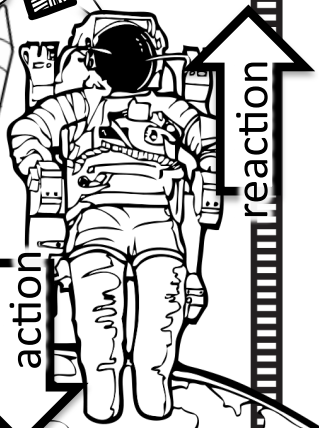






One small step for man...





The Octopus is a member of the Cephalopod group, which is a type of marine animal that has a special organ from which they shoot water at high rates. This jet of water propels their body forward.

How does this animal's method of transportation demonstrate the 3rd law of motion?

motion

For every **ACTION** there is an _____ and _____

REACTION.

or

Forces occur in _____ and _____

pairs.

Balanced forces keep this boy in place on his chair. What are the two equal and opposite forces occurring here?