Newtonian Mechanics

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July 13, 2021

Contents

Objectives

We want to appraise historical facts and concepts related to Physics [(Check the general objective)]

Particular Objectives

- Describe with cards a general description of Newtonian Mechanics.
- Revise fundamental concepts of Physics.
- Do some exercises with the three Newton's laws.

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Classical Physics

Classical Physics worked to describe our universe at our scale (before 1900s) and some branches include thermodynamics, electromagnetism, optics, and others areas.

[See more branches]

Classical Mechanics

Classical Mechanics is the theory of mechanics based on Newton's laws of motion for describing how the bodies move.

Classical Mechanics and Newtonian Mechanics

Mechanics . . .

We use the Newton's laws of motion,

What is Newtonian Physics (Mechanics)?

Therefore, Newtonian Physics

The Newton's Laws

First law

In the absence of external forces, an object at rest remains at rest and an object in motion continues in motion with a constant velocity (that is, with a constant speed in a straight line)

$$\begin{aligned} \vec{a} &= 0 \\ \sum \vec{F} &= 0 \end{aligned} \tag{1}$$

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The Newton's Laws

Second law

The acceleration of an object is directly proportional to the net force acting on it and inversely proportional to its mass.

$$\sum \vec{F} = m\vec{a} \tag{2}$$

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The Newton's Laws

Third law

If two objects interact, the force $\vec{F}_{12}$ exerted by object 1 on object 2 is equal in magnitude to and opposite in direction to the force $\vec{F}_{21}$ exerted by object 2 on object 1:

$$\vec{F}_{12} = -\vec{F}_{21} \tag{3}$$

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A plenty of concepts

We will be unable to talk about every concept related to Classical, Mechanics or Newtonian Physics, such as,

- Inertia
- Acceleration
- Force
- Inertial and non-inertial frames
- Mass
- Vector, scalars

But I let you know some examples.

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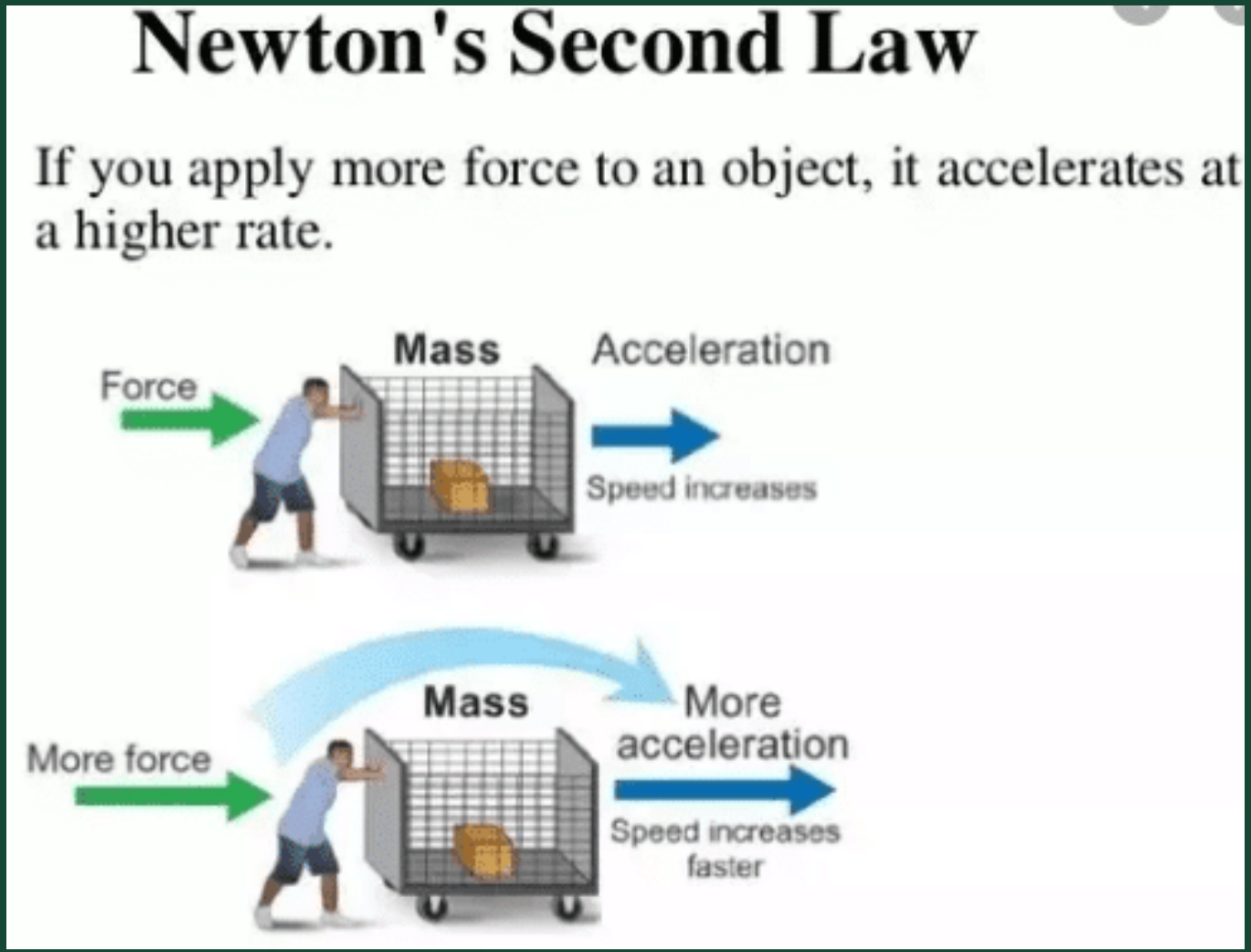
First

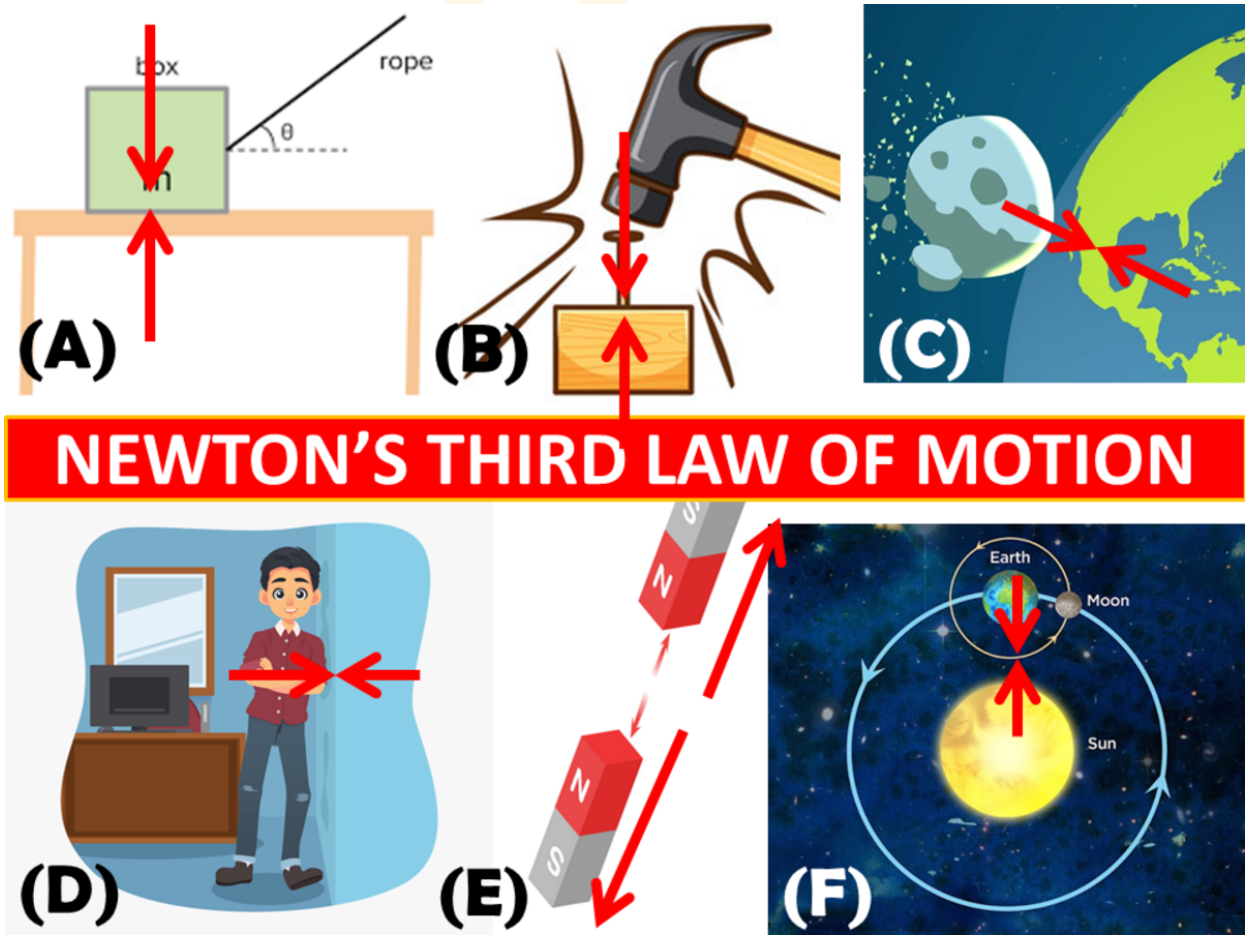
Newton's First Law

An object at rest remains at rest.
An object in motion remains in motion at a constant speed and in a straight line (**constant velocity**) unless acted upon by an **UNBALANCED** force.

Second


Newton's Second Law
If you apply more force to an object, it accelerates at a higher rate.
Force
Mass
Acceleration
Speed increases
More force
Mass
More acceleration
Speed increases faster

Third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(A)
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(C)
NEWTON'S THIRD LAW OF MOTION
(D)
(E)
Earth
Moon
Sun
(F)

Activity

Go to this PADLET or the QR code to contribute to the Newtonian Mechanics chart padlet

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Conclusions

- We described with cards a general description of Newtonian Mechanics.
- We revised fundamental concepts of Physics.
- We did some exercises with the three Newton's laws.

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References

[1] David Halliday, Robert Resnick, and Jearl Walker. *Fundamentals of physics*. John Wiley & Sons, 2013.

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