

Newton's Laws

OBJECTIVES

Students should be able to:

1. Describe Aristotle's Horse Cart theory and what was wrong with it.
2. Describe Galileo's experiment that led to his conclusions about inertia
 - (a) Describe how this experiment is exemplified in modern day amusement parks
3. Define in a sentence Galileo's Law of Inertia (Alias-Newton's first Law of Motion)
4. Describe what effects an object's inertia.
5. Characterize rotational inertia
 - (a) Describe the relationship between an object's rate of spin and the object's distribution of its mass.
6. Give examples of how inertia is demonstrated in everyday life (TOYS)
7. Write in words Newton's Second Law of Motion.
 - (a) Describe a force
 - (b) Give the SI and English unit of force.
 - (c) Give the symbols for force in SI and English systems.
8. Describe the relationship between force and acceleration.
9. Describe the relationship between force and mass.
10. Do problems that make proportionality predictions based on Newton's Second Law of Motion. ($F=ma$)
11. Describe the formula for calculating weight from mass. ($w=mg$)
 - (a) Describe what it means to experience a certain number of "g's."
 - (b) Convert back and forth between g's and m/s^2 .
12. Write in a complete sentence Newton's Third Law of Motion.
13. Apply Newton's Third Law of Motion to Problems.
14. Be able to identify the "reaction force" in a given situation.
15. Distinguish between the concepts of mass and weight.
16. Memorize the value for the acceleration of any object near the surface of the Earth.
 - (a) Describe what it means to be weightless.
17. Utilize Newton's Laws in conjunction with the Kinematics equations from chapter 1 to solve problems