

Newton's Laws of Motion

21. Newton's First Law = if the forces acting on an object are balanced, the resultant force on the object is zero, and:
- If the object is at rest, it stays stationary
 - If the object is moving, it keeps moving with the same speed and in the same direction.
22. When a vehicle travels at a steady speed the resistive forces balance the driving force.
23. The velocity (speed and/or direction) of an object will only change if a resultant force is acting on the object
24. The tendency of objects to continue in their state of rest or of uniform motion is called **inertia**.

25. Newton's Second Law = the acceleration of an object is:

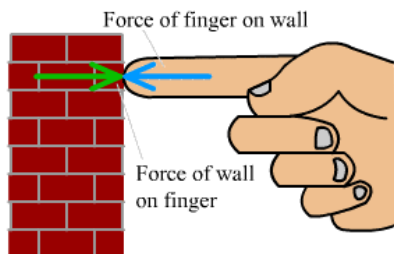
- Proportional to the resultant force on the object.
- Inversely proportional to the mass of the object.

26. **Resultant force = mass × acceleration** $F = m a$

Force (N) Mass (kg) Acceleration (m/s²)

27. **Inertial mass** is a measure of how difficult it is to change the velocity of an object
28. Inertial mass is defined as the ratio of force over acceleration.

29. Newton's Third Law = when two objects interact, they exert equal and opposite forces on each other.



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