Physics

Fall 2026

Weeks 7 - 8

Monday, September 21

- **5E** - explain and apply the concepts of equilibrium and inertia as represented by Newton's first law of motion using relevant real-world examples such as rockets, satellites, and automobile safety devices

- O: I will be able to explain the concept of force
- D: by completing a Lab involving inertia and writing a CER about it.

Wednesday, September 23

- T: 5E - explain and apply the concepts of equilibrium and inertia as represented by Newton's first law of motion using relevant real-world examples such as rockets, satellites, and automobile safety devices
- 5F - calculate the effect of forces on objects, including tension, friction, normal, gravity, centripetal, and applied forces, using free body diagrams and the relationship between force and acceleration as represented by Newton's second law of motion
- 5G - illustrate and analyze the simultaneous forces between two objects as represented in Newton's third law of motion using free body diagrams and in an experimental design scenario
- O: I will be able to identify and explain the parts of a free body diagram
- D: by completing a worksheet after I participate in a lecture, watch a video, and discuss real world examples with my group.

Journal 2.1

- What was my grade for the first 6-weeks? Am I happy with it? What will I do this six-weeks as compared to the 1st six-weeks?

Different definitions

- **A force is a push or pull upon an object** resulting from the object's interaction with another object.
- **Force**, in mechanics, **any action that tends to maintain or alter the motion of a body or to distort it**.
- **Force** is an external agent capable of changing a body's state of rest or motion. It has a magnitude and a direction.
- A force is **an influence that can cause an object to change its velocity** unless counterbalanced by other forces.

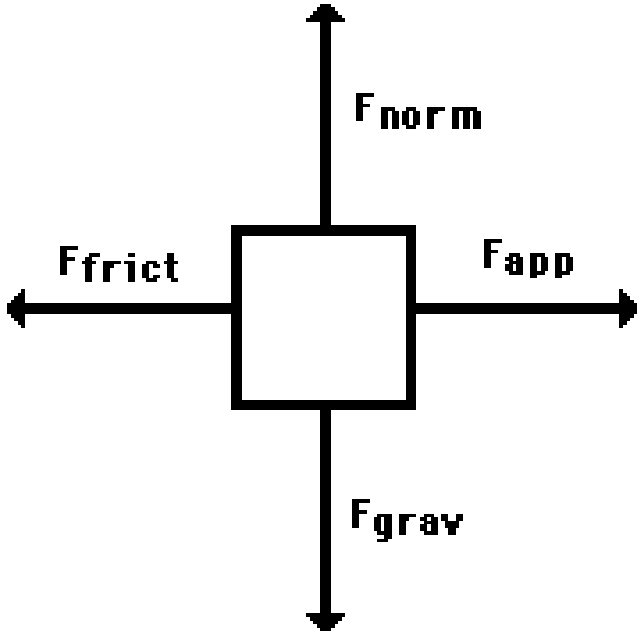
Notes – Newton's 1st and 3rd Laws

- 1st Law: An object in motion will remain in motion unless acted on by an external force. An object at rest will remain at rest unless acted on by an external force.

- 3rd Law: For every action there is an equal but opposite action.

Free Body Diagram

- Free-body diagrams are diagrams used to show the relative magnitude and direction of all forces acting upon an object in a given situation.



Types of Forces

- Gravity
- Normal
- Applied
- Friction

Inertia

- a property of matter by which it continues in its existing state of rest or uniform motion in a straight line, unless that state is changed by an external force.

- Essentially, inertia is Newton’s First Law

- Does not depend on velocity, shape, or momentum, it ONLY depends on mass. More mass = more inertia

Unit of Measurement

- Newton = N

- 1 N = 1 kg m/s^2

Friday, September 25

- T: 5E - explain and apply the concepts of equilibrium and inertia as represented by Newton's first law of motion using relevant real-world examples such as rockets, satellites, and automobile safety devices
- 5F - calculate the effect of forces on objects, including tension, friction, normal, gravity, centripetal, and applied forces, using free body diagrams and the relationship between force and acceleration as represented by Newton's second law of motion
- 5G - illustrate and analyze the simultaneous forces between two objects as represented in Newton's third law of motion using free body diagrams and in an experimental design scenario
- O: I will be able to explain scenarios of real world situations as they pertain to Newton's 1st and 3rd laws
- D: by completing a worksheet.

Monday, September 28

- T: 5E - explain and apply the concepts of equilibrium and inertia as represented by Newton's first law of motion using relevant real-world examples such as rockets, satellites, and automobile safety devices
- 5F - calculate the effect of forces on objects, including tension, friction, normal, gravity, centripetal, and applied forces, using free body diagrams and the relationship between force and acceleration as represented by Newton's second law of motion
- 5G - illustrate and analyze the simultaneous forces between two objects as represented in Newton's third law of motion using free body diagrams and in an experimental design scenario
- O: I will be able expand my understanding of Newton’s Laws
- D: by completing a POGIL.

Wednesday, September 30

- T: 3Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to: (A) develop explanations and propose solutions supported by data and models and consistent with scientific ideas, principles, and theories; (B)communicate explanations and solutions individually and collaboratively in a variety of settings and formats; (C)and engage respectfully in scientific argumentation using applied scientific explanations and empirical evidence.
- O: I will be able to produce a scientific CER
- D: by analyzing a video, discussing an appropriate CER, and then re-writing my CER from the Inertia Labs.

Friday, October 2

- T: 5F - calculate the effect of forces on objects, including tension, friction, normal, gravity, centripetal, and applied forces, using free body diagrams and the relationship between force and acceleration as represented by Newton's second law of motion
- O: I will be able to calculate force including weight and friction
- D: by completing two worksheets about these topics.

Newton’s Second Law

$$F = ma$$

force = (mass)(acceleration)