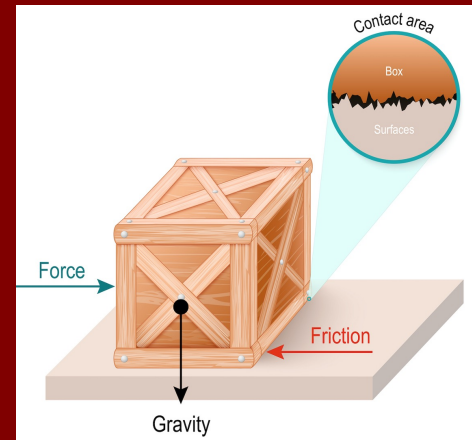


Exploring Frictional Forces

- Friction
- Friction and Newton's Laws
- Static and Kinetic Friction
- Coefficient of Friction
- Practice



Preview File

Please enjoy this preview of your Student Version of the presentation. Please note within this sample file:

- Some slides appear blank because they have been removed
- Student versions have portions of the text removed which is given in the teacher version and appear as _____ which the students are to fill in
- Other slides may have on them, this represents writing that has been removed on this sample

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Friction – Think About It

- What causes friction?
- What affects the amount of friction two objects experience?
- Describe how your life would be different if friction didn't exist.



Watch the video and explain why they couldn't separate the books.

Friction

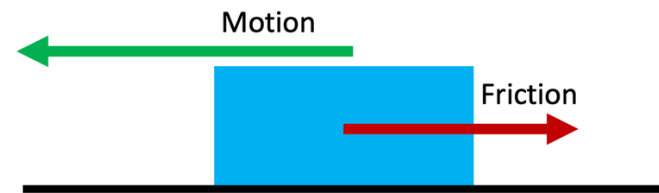
- The analysis of friction is very important to practical situations since friction is present everywhere



- Friction is a good and bad thing
 - Good when our tires meet the pavement
 - Bad when reducing efficiency and/or producing heat

Friction

-
- Kinetic friction
 - Static friction
 - Air resistance (drag friction or fluid friction)
 - Parachutes greatly increase air resistance and therefore, slow skydivers quickly



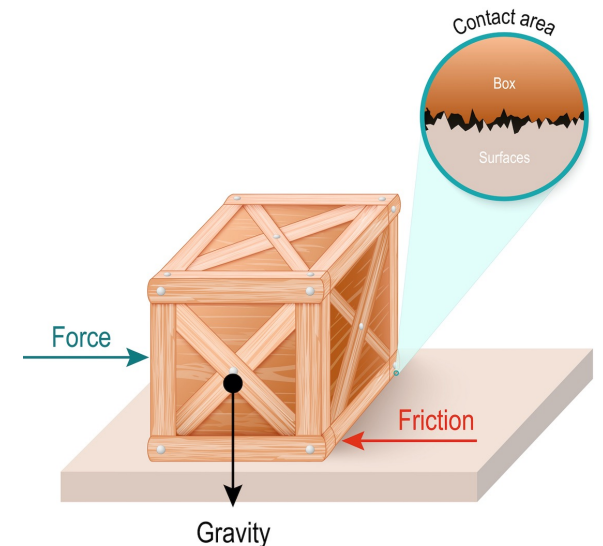
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Two types – Static and Kinetic

1. _____

2. _____

- The magnitudes of friction depend on
 - the surfaces in contact with each other (ie. box and floor)
 - the normal force (mass)



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Kinetic friction

- Kinetic friction acts on any object that is in motion
- The magnitude of the force needed to keep the _____



Coefficients of Friction

The coefficient of friction is a ratio of the magnitude of the force of friction between two surfaces to the normal force between those surfaces.

$$\mu_S = \frac{F_{S,max}}{F_N} \quad \text{and} \quad \mu_K = \frac{F_K}{F_N}$$

Coefficients of Friction

- Determining μ_s and μ_k for given substances is done through experimentation
- i.e.

Materials	μ_s	μ_k
Rubber on concrete (dry)	1.1	1.0
Rubber on asphalt (dry)	1.1	1.0
Steel on steel (dry)	0.60	0.40
Steel on steel (greasy)	0.12	0.050
Leather on rock (dry)	1.0	0.80

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Check Your Understanding

A musician applies a horizontal force of 17 N [W] to an instrument case of mass 5.1 kg . The case slides across a table with an acceleration of $0.39\text{ m/s}^2\text{ [W]}$. What is the coefficient of kinetic friction between the case and the table?