PHYS2350: Forces

Dr. Wolf

Fall 2024

Group discussion:

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- A push or a pull (it is a *vector*)
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Develop a notation to describe forces

- Write force as a vector thing: $\vec{F}$

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Develop a notation to describe forces

- Write force as a vector thing: $\vec{F}$
- Indicate that there are two interacting entities: $\vec{F}_{\text{Book,Table}}$

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2. Non-contact forces

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   - Tension
   - Air resistance
   - Spring force
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Force notation:

$$\vec{F}^{(\text{type})}_{A,B}$$

Rules for good Free-Body diagrams

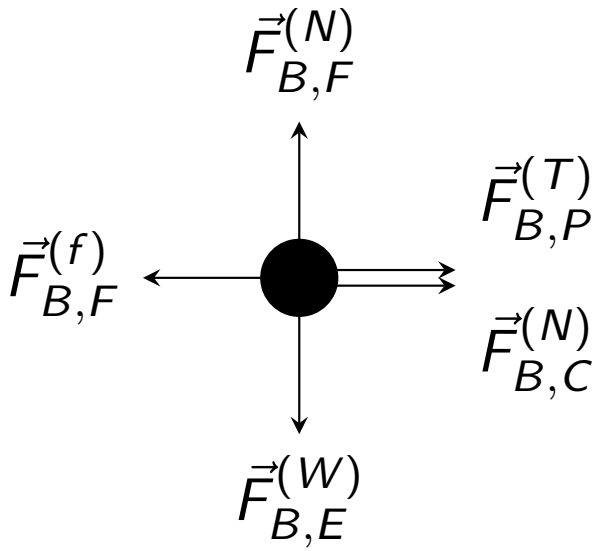
1. Use our force notation to label each force

$$\vec{F}^{(\text{type})}_{A,B}$$

2. Draw a vector in the *direction* that the force is going in. Don't worry about the length.
3. Put the tail of the force vector on the object.

Part I

Free body diagram for box being pushed/pulled by Pam and Chris

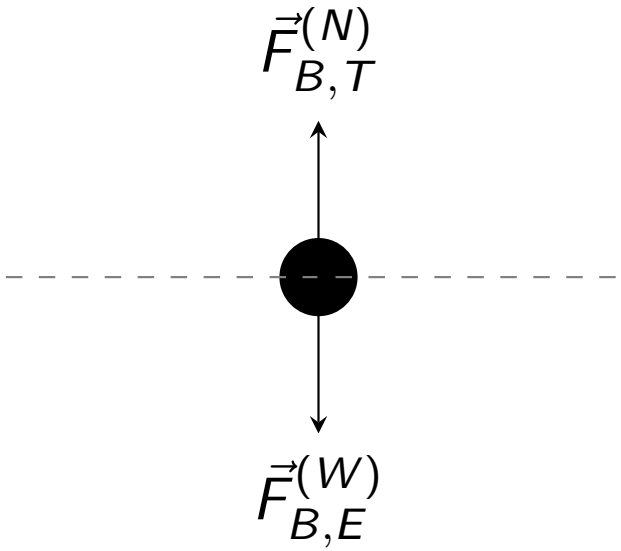


Symbol key:

- P = Pam
- C = Chris
- F = Floor
- B = Block
- E = Earth

Part II

Free body diagram for book on table



Symbol key:

- B = Book
- T = Table
- E = Earth

Part II

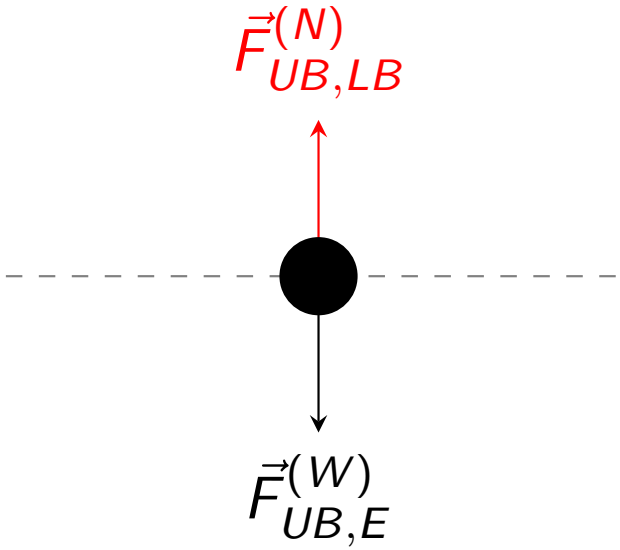
Free body diagram for books on table

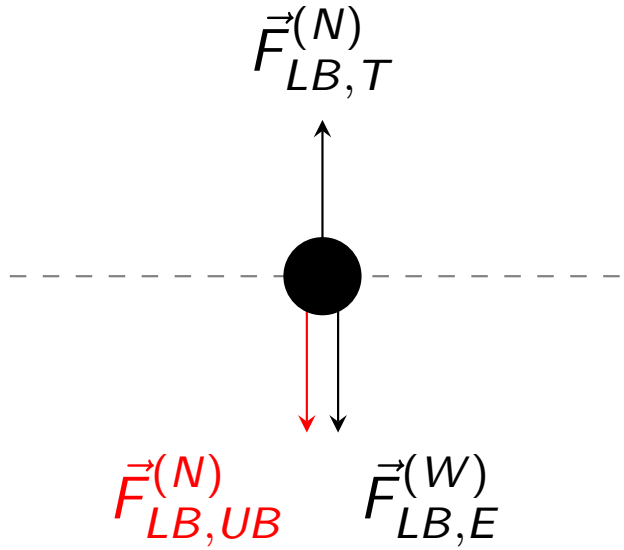
Symbol key:

- UB = Upper Book
- LB = Lower Book
- T = Table
- E = Earth

Part III

Why did I make these vectors red?





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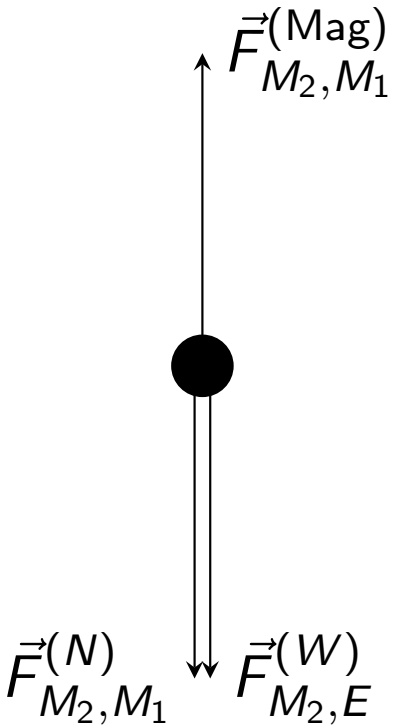
Newton's 3rd Law

How does our notation make identifying 3rd law pairs easy?

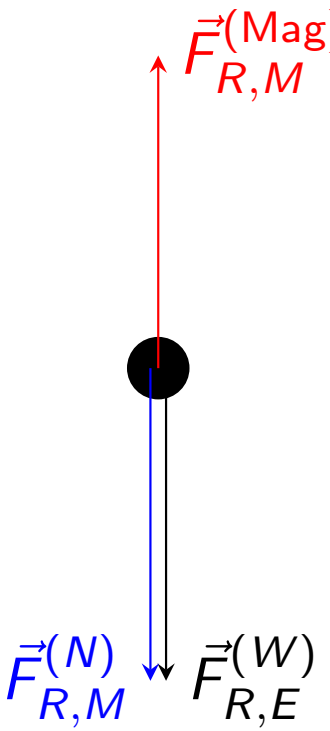
Part IV: Contact and non-contact forces

Free-body diagram for magnet 2:



Part IV: Contact and non-contact forces

Free-body diagram for iron rod:



Free-body diagram for magnet