

## Today:

- Force, momentum, and speed
- Free body-diagrams

## *Irish Phrasebook*

***craic*** – fun, news, gossip

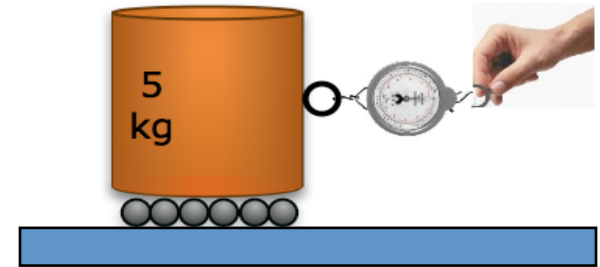
*Any craic?; What's the craic?; Sure we'll go for the craic*

# Announcements

- Ch 1 on-paper homework due Monday in class
  - Bring your answers to **Part D** to class on Friday for a peer-feedback activity
- Ch 2 LON-CAPA homework due on Friday night
  - Help room starts tomorrow
- Reading questions for Ch 3.1-3.4 due on Monday
- JS-Math instructions were sent in the email

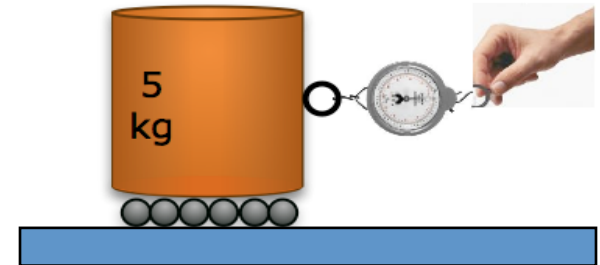
You are pulling the block along a table  
To keep the block moving at constant speed  
you need to

- A. Pull with a decreasing force.
- B. Pull with a constant force.
- C. Pull with an increasing force.
- D. Not pull at all.



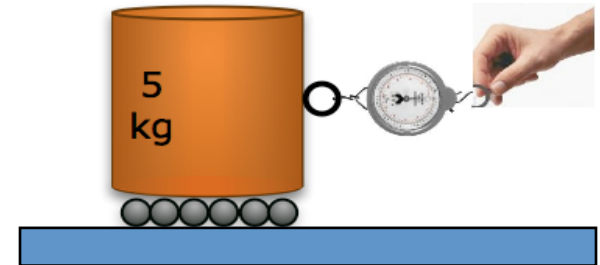
You are pulling the block along a table  
To ensure that the block's momentum  
increases at a constant rate you need to

- A. Pull with a decreasing force.
- B. Pull with a constant force.
- C. Pull with an increasing force.
- D. Not pull at all.



You are pulling the block along a table  
To ensure that the block speeds up at a  
constant rate you need to

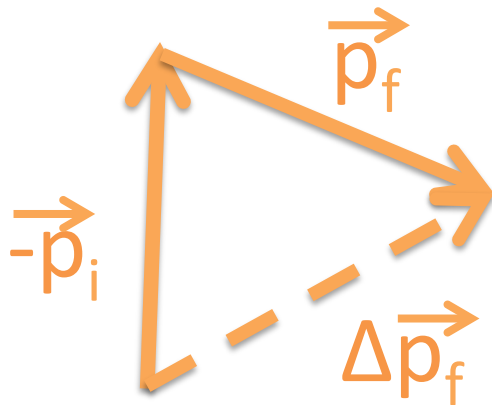
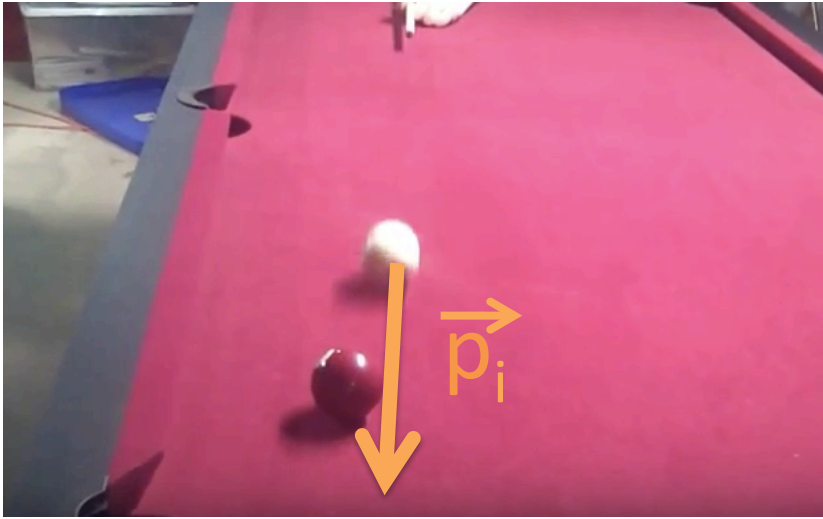
- A. Pull with a decreasing force.
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Momentum is a vector quantity

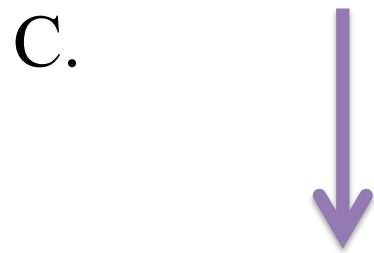
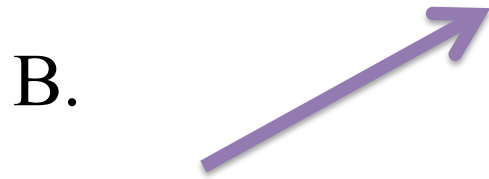
Changing momentum of a cue ball in pool

Lets take a closer look – What is the direction of the force?

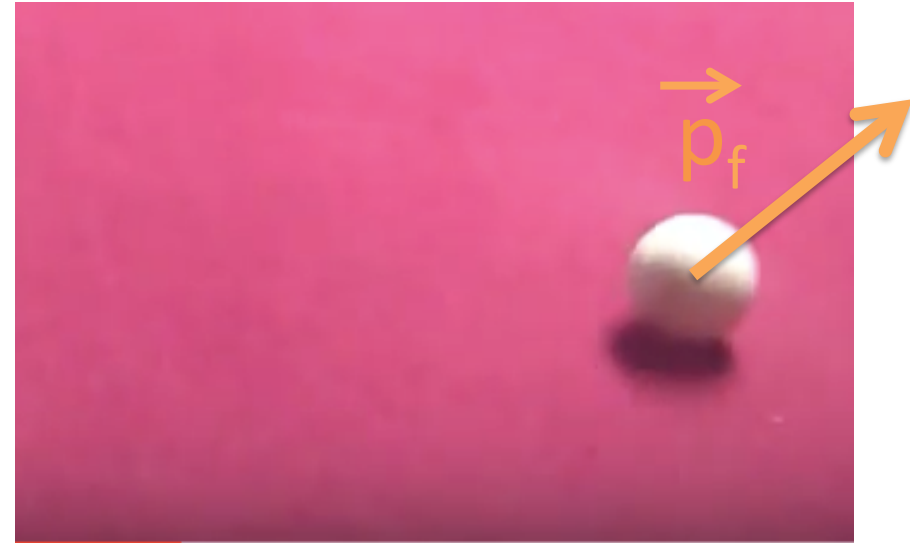
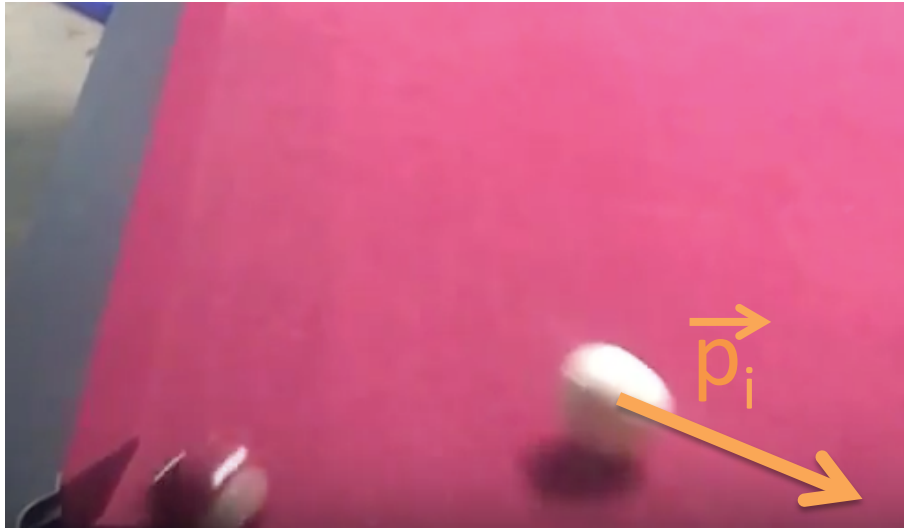


What is the direction of the net force on the cue ball?

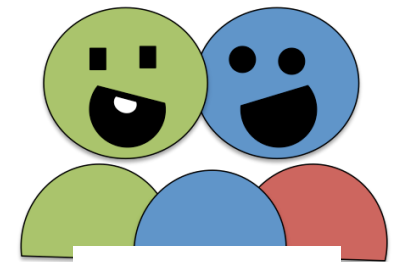
What is the direction of the force on the cue ball?







What is the direction of the net force on the cue ball?

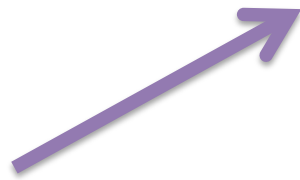


Discuss It!

What is the direction of the force on the cue ball?



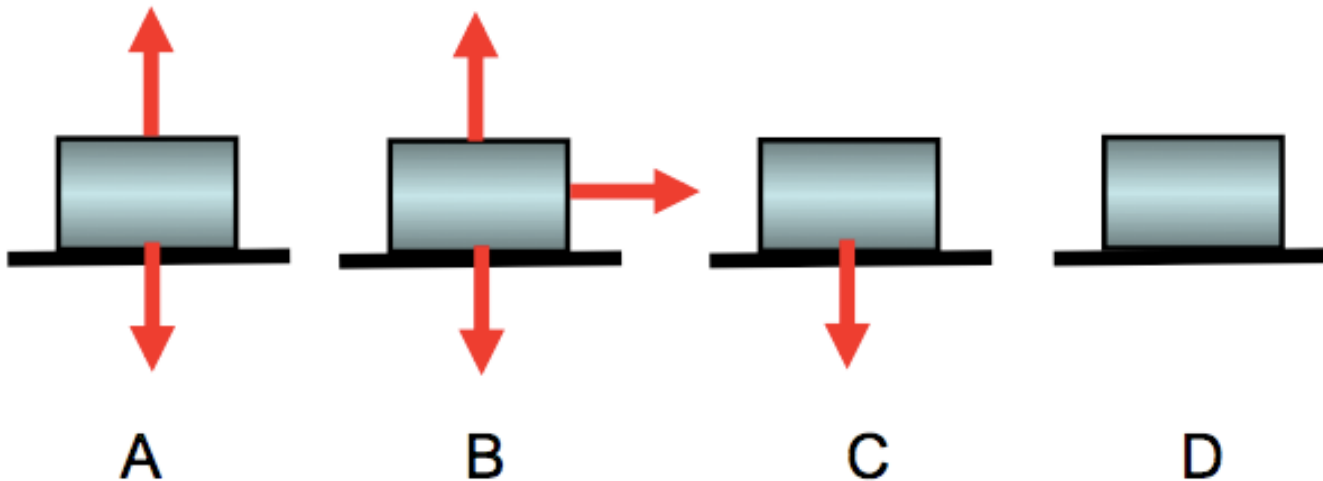
A. 

B. 

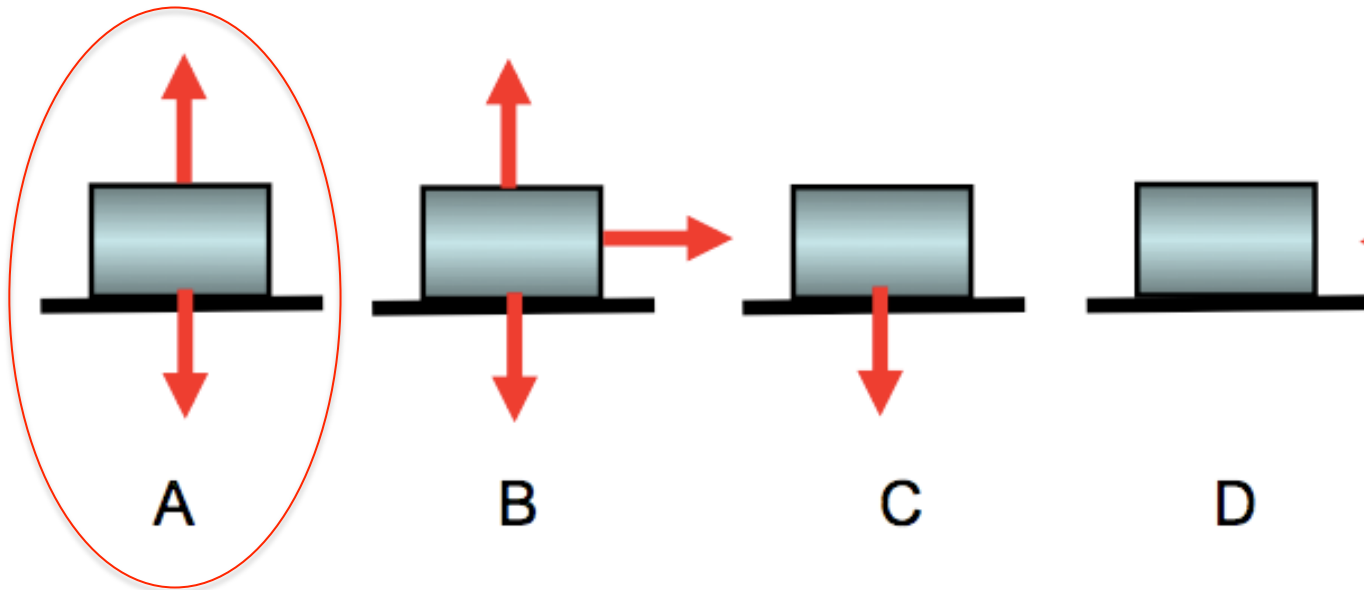
C. 

D. 

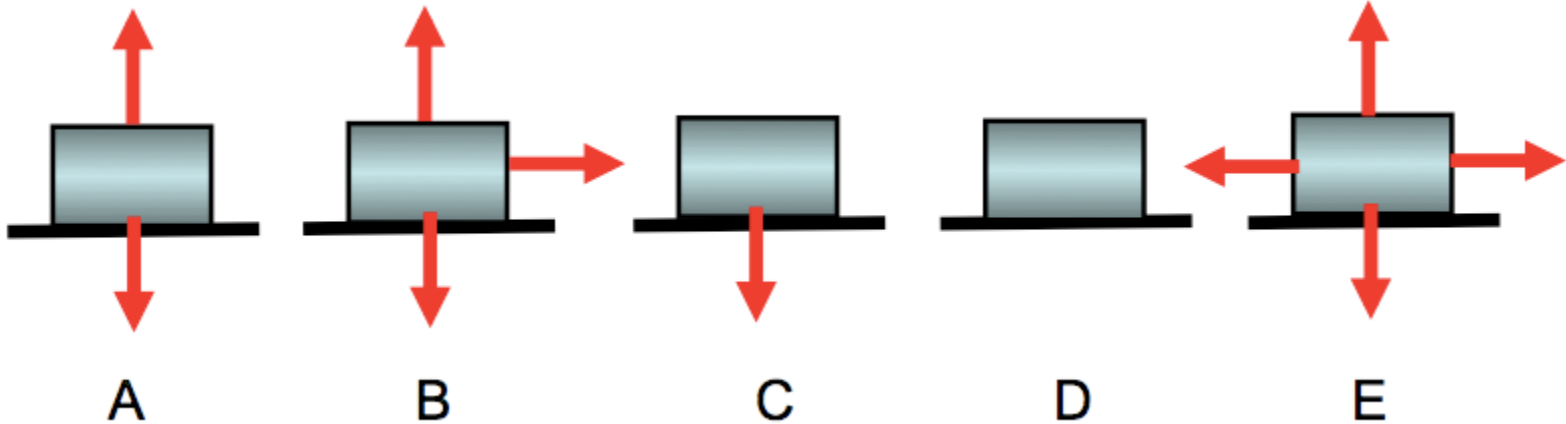
A block sits at rest on a frictionless surface. Which of the following sketches most closely resembles the correct free-body diagram for all forces acting on the block? (Each red arrow represents a force. Observe number and direction, but ignore lengths)



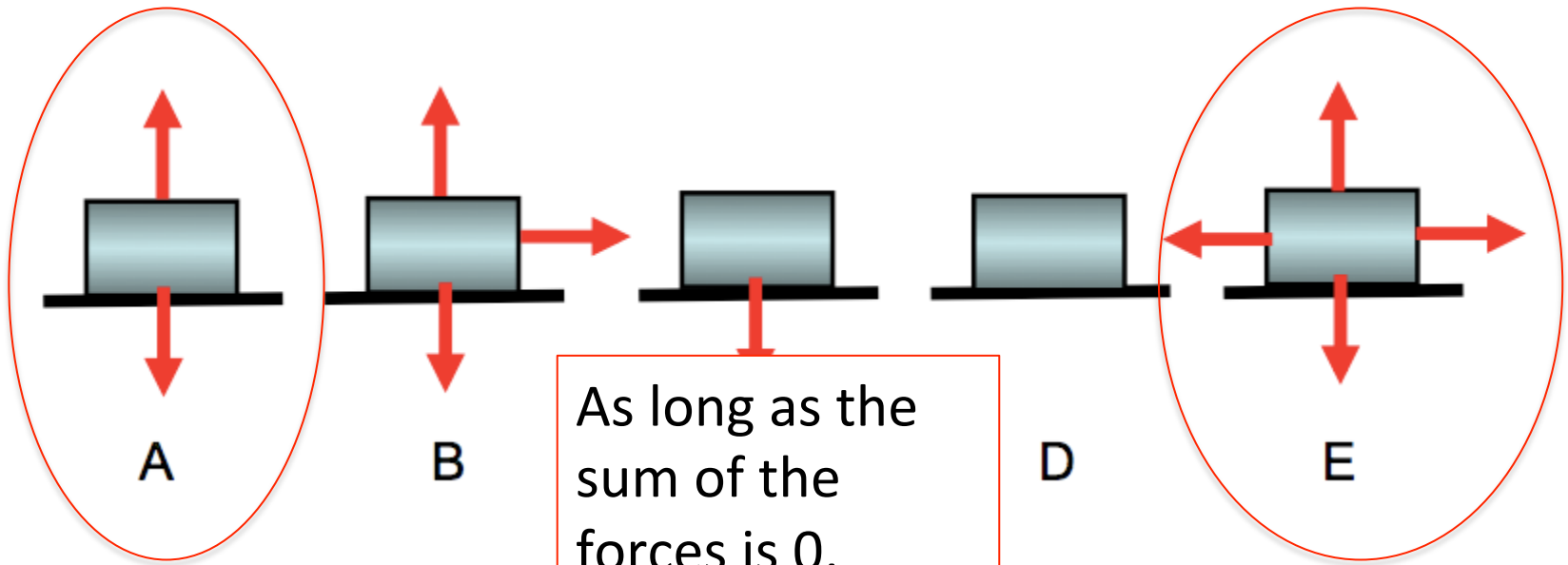
A block sits at rest on a frictionless surface. Which of the following sketches most closely resembles the correct free-body diagram for all forces acting on the block? (Each red arrow represents a force. Observe number and direction, but ignore lengths)



Now, the same block moves with a constant velocity to the right on the **frictionless** surface. Which of the following most closely resembles the correct free-body diagram for all forces acting on the block?



Now, the same block moves with a constant velocity to the right on the **frictionless** surface. Which of the following most closely resembles the correct free-body diagram for all forces acting on the block?



As long as the sum of the forces is 0, either FBD is correct