

## Week 6 - Dynamics

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**Homework Procedure:** Read pages specified in Honors Physics Essentials by Dan Fullerton. Questions labeled TQ will be questions about the text you read. These TQ's can be answered in one word, one phrase, or a complete sentence. Questions labeled CQ are conceptual questions and must be answered in complete sentences. Questions labeled QQ's are quantitative questions and the equation, substitution with units, and solve with units must be shown on your paper. CQ's and QQ's will be similar to the questions found in the Honors Physics Essentials textbook.

### Read Page 60-62 (Newton's 1<sup>st</sup> Law of Motion)

TQ1. Unless there is a net (unbalanced) force on an object, what will happen to an object's motion in its current state (according to Newton's 1<sup>st</sup> law of inertia)?

TQ2. What will happen to an object if there is a net (unbalanced) force acting on it?

TQ3. When the net force on an object is 0, what can be said about the object?

TQ4. What is inertia?

TQ5. What is the measure of an object's inertia?

CQ6. A 5.0 kg box is being pushed with a 15 N force to be moving at a velocity of 10.0 m/s. How can the box have its inertia increase? (A) Increase the force of push on the box (B) Increase the speed the box is traveling (C) Increase the mass of the box (D) Increase the friction between the box and its surface

CQ7. Which object has the most inertia? (A) A 0.001-kilogram bumblebee traveling at 2 meters per second (B) A 0.1-kilogram baseball traveling at 20 meters per second (C) A 5-kilogram bowling ball traveling at 3 meters per second (D) A 10-kilogram sled at rest

CQ8. If the sum of all the forces acting on an object moving 5 m/s is zero, the object will do what? (A) slow down and stop (B) change the direction of its motion (C) accelerate uniformly (D) continue moving with constant velocity

Object	Mass (kg)	Speed (m/s)
A	4.0	6.0
B	6.0	5.0
C	8.0	3.0
D	16.0	1.5

CQ9. Which object in the table above has the greatest inertia?

TQ10. Give one example of a contact force and one example of a field force.

TQ11. What are the units that forces are measured in? What is this unit equivalent to (in terms of SI Units)?

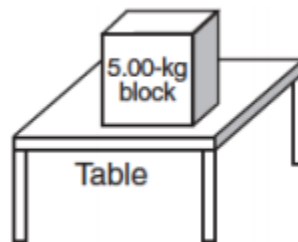
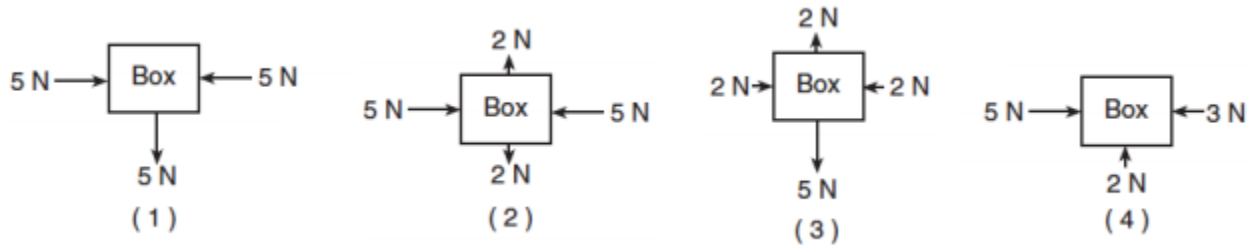
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### Read Pages 62-63 (Free Body Diagrams)

TQ12. What is another name for the force of gravity?

TQ13. What is the perpendicular force that a surface would push with if a box was sitting on a surface?

CQ14. Which diagram represents a box with a net force of zero (or is in static equilibrium)?



CQ15. A 5.00 kg block is at rest on a table as shown above. On the diagram below, sketch all forces (the free body diagram) acting on the box.



CQ16. Which of the following is in equilibrium? (A) a satellite orbiting Earth in a circular orbit (B) a ball falling freely toward the surface of Earth (C) a car moving with a constant speed along a straight, level road (D) a projectile at the highest point in its trajectory