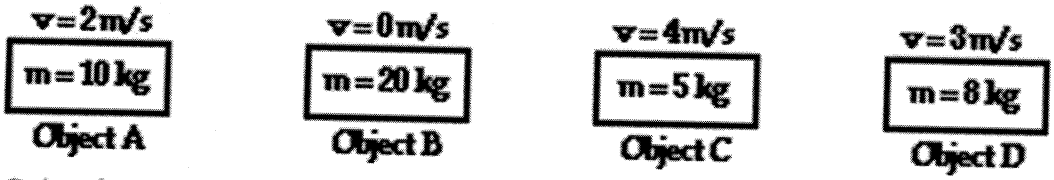
Practice Newton's Laws

1. The amount of inertia possessed by an object is dependent solely upon its mass.

2. If a moose were chasing you through the woods, its enormous mass would be very threatening. But if you zigzagged, then its great mass would be to your advantage. Explain why.
Because it would be more difficult for the moose to change its direction due to its greater mass.

3. Inertia can best be described as d.
a. the force which keeps moving objects moving an stationary objects at rest.
b. the willingness of an object to eventually lose its motion
c. the force which causes all objects to stop
(d.) the tendency of any object to resist change and keep doing whatever its doing

4. Mass and velocity values for a variety of objects are listed below. Rank the objects from smallest to greatest inertia. C < D < A < B



5. Renatta Oyle is having car troubles. She is notorious for the trail of oil drops that she leaves on the streets of Glenview. Observe the following oil traces and indicate whether Renatta's car is being acted upon by an unbalanced force. Give a reason for your answers.

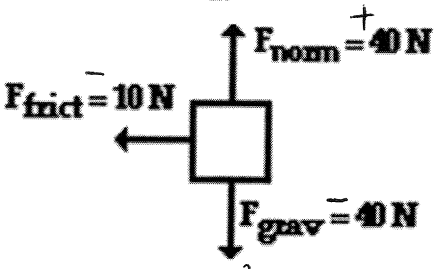
	Unbalanced Force?
a.  Reason: † Accelerating to the Right	(Yes) or No
b.  Reason: Constant Velocity	Yes or (No)
c.  Reason: Neg Acceleration to the Right	(Yes) or No

6. If the net force acting upon an object is 0 N, then the object MUST e. Circle one answer.
a. be moving b. be accelerating c. be at rest
d. be moving with a constant speed in the same direction (e.) either c or d.

7. An object's mass refers to d and an object's weight refers to b. Fill in each blank.
a. the amount of space it takes up b. the force of gravitational attraction to Earth
c. how dense an object is d. the amount of stuff present in the object

8. A free-body diagrams show all the individual forces acting upon an object. The net force is the *vector sum* of all these forces (ΣF). Determine the net force and state if there is an acceleration.

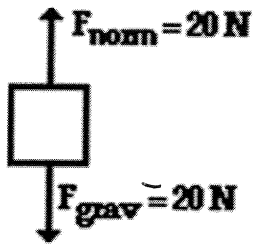
a.



$\Sigma F =$ $-10\ N$

Accel'n? (Yes) or No

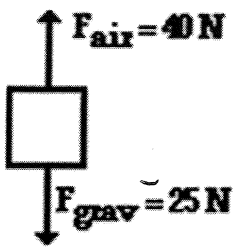
b.



$\Sigma F =$ $0\ N$

Accel'n? Yes or (No)

c.



$\Sigma F =$ $+15\ N$

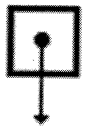
Accel'n? (Yes) or No

9. Complete the following table showing the relationship between mass and weight.

Object	Mass	Approx. Weight
Melon	1 kg	$F_w = mg$ $1kg \cdot 10 m/s^2 = 10N$
Apple	$m = \frac{F_w}{g} = \frac{1N}{10} = 0.1kg$	~1.0 N
Pat Eatladee	25 kg	$25kg \cdot 10 m/s^2 = 250N$

10. For each force diagram, determine the net or resultant force (ΣF), the mass and the acceleration of the object. Identify the direction (the second blank) of the two vector quantities. NOTE: F_{grav} stands for the weight of the object.

a.

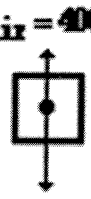


$\Sigma F =$ $-600N$ Down

$m = \frac{F_w}{g} = \frac{600N}{10 m/s^2} = 60kg$

$a = \frac{F_{net}}{m} = \frac{-600N}{60kg} = -10 m/s^2$ down

b.



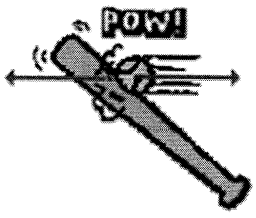
$\Sigma F =$ $-600N + 400N$, $-200N$

$F_w = m \cdot g$ $m = \frac{F_w}{g}$ $m = \frac{600N}{10 m/s^2} = 60kg$

$a = \frac{F}{m} = \frac{-200N}{60kg} = -3.3 m/s^2$ down

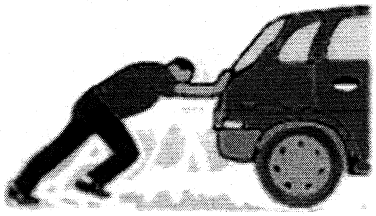
$F = ma$

11. For each stated *action force*, identify the *reaction force*.



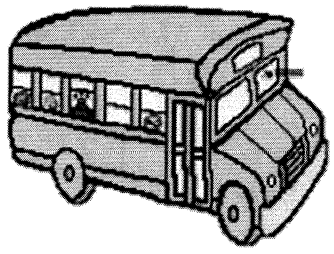
Bat hits ball.

Ball hits Bat



Man pushes car.

Car Pushes Man



Bus hits bug.

Bug hits Bus