

Using Newton's Laws (p. 96 - 101)

I. Using Newton's Second Law

1. What does F_g represent?

Force due to gravitational attraction between two objects

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2. Restate Newton's Second Law with regards to an object's mass.

$$F_g = mg$$

$$F_g = (\text{mass}) (\text{acceleration due to gravity})$$

(N) (kg) (m/s^2)

3. The value of g is **consistent** from planet to planet.

changes

Circle One : True False

4. Mass **changes** from planet to planet.

is consistent

Circle One : True False

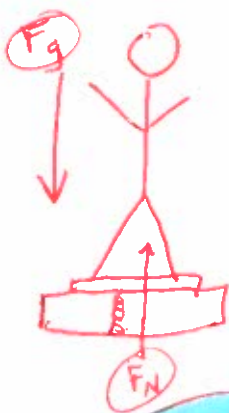
5. What does F_{sp} represent? (Restoring force)

Push or pull a spring exerts on an object

6. How is a scale reading determined?

1. Scale exerts an upward force on you. 2. Net force (No accel) equals zero

3. $F_{sp} = F_g$ (Weight = force of springs exerted on you)



7. If you weighed 445 Newtons (100 lbs) on Earth, you would also weigh 445 N on Pluto.

Circle One : True False g = changes from planet to planet

8. Identify what would happen to your weight on a scale in an elevator if the elevator :

Remains Stationary $F_{sp} = F_g$ $F_{sp} = F_N$

Circle One : Increases Decreases Remains the Same

Moves Upward $F_{sp} > F_g$ "greater than"

Circle One : Increases Decreases Remains the Same

Moves Downward $F_{sp} < F_g$ "less than"

Circle One : Increases Decreases Remains the Same

Upward = positive direction of acceleration

Ex.

Space Shuttle Take-off (Multiples of "g")

9. Define the term apparent weight.

Apparent Weight - force an object experiences as a result of all the forces acting on it, giving the object acceleration

10. If a person standing on a scale were in free fall what would each of the following be?

Reading on the scale = Zero

Apparent Weight = Zero

Acceleration Due to Gravity = -g (-9.8 m/s²) ← offsets regular g (9.8 m/s²)

11. Define the term weightlessness.

Weightlessness - situation in which no contact forces are pushing up on an object and the object's apparent weight is zero

Space Station

II. Drag Force & Terminal Velocity

1. Define the term drag force.

Drag Force - force exerted by a fluid on the object moving through the fluid

Mythbusters
↳ Semi-Trucks

2. List two examples of drag forces.

1. Wind Resistance (Air)
2. Water Resistance

Ex - Running, Cars, Planes, Swimmers,

3. What are five properties that affect drag force?

1. Motion of the object
2. Properties of the object
3. Properties of fluid object is moving through
4. Size + shape of the object
5. Viscosity + temperature of the fluid

4. Define the term terminal velocity.

Terminal Velocity - constant velocity that is reached when the drag force equals the force of gravity

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5. How does a person parachuting produce a faster terminal velocity than a sky diver?

Sky divers' parachute opens and sky diver becomes part of a very large object with large surface area + light-weight

Mythbusters
↳ Penny Drop