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Thought Question: Is there a net force? Y/N

- 1. A car coming to a stop.
- 2. A bus speeding up.
- 3. An elevator moving up at constant speed.
- 4. A bicycle going around a curve.
- 5. A moon orbiting Jupiter.

Momentum and Force

- Momentum = mass × velocity
- A **net force** changes momentum, causing acceleration
- Rotational momentum of a spinning or orbiting object is known as angular momentum
 = mass × velocity × distance from axis

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- 1. A car coming to a stop. Y
- 2. A bus speeding up. Y
- 3. An elevator moving at constant speed. N
- 4. A bicycle going around a curve. Y
- 5. A moon orbiting Jupiter. Y

- Mass the amount of matter in an object
- Weight the *force* that acts upon an object; depends on the acceleration of gravity (and any other accelerations)



You are weightless in free-fall!

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Newton's first law of motion: An object moves at constant velocity unless a net force acts to change its speed or direction. [conservation of momentum]

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Basic Types of Energy • Kinetic (motion) $= \frac{1}{2}m v^{2}$ m = mass v = velocity• Radiative (light) • Stored or potential Conservation of Energy: Energy can change type but cannot be destroyed.



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Radiation from the Sun

In what forms does solar radiation become transformed when it strikes Earth?









