Skating

Question:

A rotary lawn mower spins its sharp blade rapidly over the lawn and cuts the tops of the grasses off. Would the blade still cut the grasses if they weren't attached to the ground?

Observations About Skating

- At rest on a level surface:
  - If you just wait, you stay stationary
  - If you're pushed, you start moving that direction
- Moving on a level surface:
  - If you just wait, you coast steadily in straight line
  - If you're pushed, you change direction or speed

Physics Concept

- Inertia
  - A body at rest tends to remain at rest
  - A body in motion tends to remain in motion

Newton's First Law, First Version

An object that is free of external influences moves in a straight line and covers equal distances in equal times.

Physical Quantities

- Position – an object's location
- Velocity – its change in position with time

Newton's First Law, Second Version

An object that is free of external influences moves at a constant velocity.

Physical Quantities

- Position – an object's location
- Velocity – its change in position with time
- Force – a push or a pull

Newton's First Law

An object that is not subject to any outside forces moves at a constant velocity.

Question:

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Physical Quantities

- Position – an object's location
- Velocity – its change in position with time
- Force – a push or a pull
- Acceleration – its change in velocity with time
- Mass – measure of its inertia

Newton's Second Law

The force exerted on an object is equal to the product of that object's mass times its acceleration. The acceleration is in the same direction as the force.

$$\text{force} = \text{mass} \cdot \text{acceleration}$$