

Skating 1

Skating

Skating 2

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?

Skating 3

Observations About Skating

- When you're at rest on a level surface:
 - If not pushed, you stay stationary
 - If pushed, you start moving in that direction
- When you're moving on a level surface:
 - If not pushed, you coast steadily and straight
 - If pushed, you change direction or speed

Skating 4

Physics Concept

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

Skating 5

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.

Skating 6

Physical Quantities

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

Skating 7

Newton's First Law, Second Version

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

Skating 8

Physical Quantities

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

Skating 9

Newton's First Law

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

Skating 10

Question:

A rotary lawn mower spins its 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?

Skating 11

Physical Quantities

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

Skating 12

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.

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

Summary About Skating

- Skates can free you from external forces
 - You normally coast – constant velocity
 - If at rest, you stay at rest
 - If moving, you move steadily and straight
- When you experience external forces
 - You accelerate – changing velocity
 - Acceleration depends on force and mass