

**Student Name:** \_\_\_\_\_**Class:** \_\_\_\_\_**Student ID:** \_\_\_\_\_**Date:** {{DATE}}

## Assessment Details

|                             |                                                                                                                                 |
|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| <b>Duration:</b> 45 minutes | <b>Total Marks:</b> 100                                                                                                         |
| <b>Topics Covered:</b>      | <ul style="list-style-type: none"><li>• Newton's First Law</li><li>• Newton's Second Law</li><li>• Newton's Third Law</li></ul> |

## Instructions to Students:

1. Read all questions carefully before attempting.
2. Show all working out - marks are awarded for method.
3. Calculator use is permitted except where stated otherwise.
4. Write your answers in the spaces provided.
5. If you need more space, use the additional pages at the end.
6. Time management is crucial - allocate approximately 1 minute per mark.

**Question 1**

**[2 marks]**

What is the primary concept described by Newton's First Law?

A) Force and motion

B) Energy and work

C) Inertia and equilibrium

D) Gravity and friction

**Question 2**

**[2 marks]**

A car is moving at a constant velocity. What force is acting upon it?

A) Friction

B) Gravity

C) Normal force

D) No net force

**Question 3**

**[8 marks]**

Describe a scenario where an object is in a state of equilibrium. How does Newton's First Law apply to this situation?

**Question 4**

**[8 marks]**

A book is placed on a frictionless surface. What will happen to the book if a force is applied to it?



## Section B: Newton's Second Law [40 marks]

### Question 5

[2 marks]

What is the relationship between force, mass, and acceleration according to Newton's Second Law?

A)  $F = ma$

B)  $F = m/a$

C)  $F = a/m$

D)  $F = m - a$

### Question 6

[2 marks]

A car accelerates from 0 to 60 km/h in 10 seconds. If the mass of the car is 1500 kg, what is the net force acting upon it?

A) 1000 N

B) 1500 N

C) 2000 N

D) 2500 N

### Question 7

[10 marks]

Describe how Newton's Second Law applies to a rocket launching into space.

### Question 8

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[10 marks]

A force of 50 N is applied to a 10 kg box. What is the resulting acceleration?



Question 9

[2 marks]

What is the primary concept described by Newton's Third Law?

A) Action and reaction

B) Force and motion

C) Energy and work

D) Gravity and friction

Question 10

[2 marks]

A person is standing on a skateboard. What happens when they push off the ground?

A) The ground pushes back on the person

B) The person moves forward

C) The skateboard moves backward

D) The person and skateboard remain stationary

Question 11

[10 marks]

Describe a scenario where Newton's Third Law applies to a real-world situation.

Question 12

[10 marks]

A tennis ball is hit by a racket. What forces are acting on the ball and the racket?





## Marking Guide

The marking guide will be based on the following criteria:

- Multiple Choice Questions: 1 point for each correct answer
- Short Answer Questions: 5 points for each question, based on accuracy, clarity, use of scientific vocabulary, and application of Newton's Laws
- Diagram Labeling Tasks: 10 points for each task, based on accuracy, clarity, and use of scientific vocabulary

## Implementation Guidelines

Ensure students have access to a calculator and a pencil.

Provide clear instructions and examples for each section.

Allow students to ask questions and seek clarification before starting the assessment.

## **Differentiation Options**

For students with visual impairments: provide large print or braille versions of the assessment.

For students with learning difficulties: provide extra time to complete the assessment.

For English language learners: provide a bilingual dictionary.

## **Bloom's Taxonomy Alignment**

The assessment is designed to align with the following levels of Bloom's Taxonomy:

- Knowledge: recall and identify key concepts and principles of Newton's Laws
- Comprehension: describe and explain the application of Newton's Laws
- Application: apply Newton's Laws to solve problems
- Analysis: analyze and evaluate the relationships between forces, motion, and acceleration

## Clear Success Criteria

The success criteria for this assessment are:

- Demonstrate an understanding of the fundamental principles of Newton's Laws
- Apply Newton's Laws to real-world scenarios and problems
- Use scientific vocabulary and concepts accurately and consistently

## Evidence Collection Methods

The assessment will provide evidence of student learning through:

- Completed multiple choice questions and short answer questions
- Diagram labeling tasks
- Written explanations and justifications

## Feedback Opportunities

Feedback will be provided to students through:

- Immediate feedback on multiple choice questions and diagram labeling tasks
- Written feedback on short answer questions
- Verbal feedback and discussion during the assessment