BEACONHOUSE ALKHALEEJ INTERNATIONAL SCHOOL

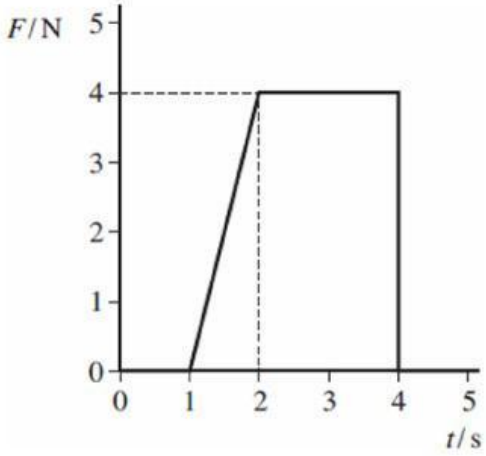
WORKSHEET

Student Name:	Grade & Section:	Date:	Subject:
_____	_____	_____	Physics

Impulse

Task 1

A 2.0 kg cart moves along a straight track and experiences the force shown in the graph.



1. Determine the total impulse acting on the cart.

Answer:

_____

_____

2. Describe how the force changes over time and explain how this affects the impulse.

Answer:

_____

3. The cart starts from rest. Determine its final velocity.

Answer:

4. A student claims: “Only the maximum force determines the change in momentum.”

Do you agree? Justify using this situation.

Answer:

5. Two carts experience the same maximum force, but different force–time graphs. One has a larger area under the graph.

Which cart will have a greater change in momentum? Explain clearly.

Answer:

6. Without calculating, predict how the impulse would change if the force increased but acted for the same interval of time. Justify your answer.

Answer:

Task 2

Two identical objects (mass = 3.0 kg) start from rest.

Object A → Graph (a)
Object B → Graph (b)

1. Determine the impulse acting on each object.

Object A:

Object B:

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2. Which object has the greater change in momentum and final velocity? Explain.

Answer:

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3. Graph (b) includes a lower force over part of the time. Explain how it can still produce a large effect.

Answer:

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4. In real-life situations, explain why applying force over a longer time can be more effective than applying a very large force briefly.

Answer:

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6. In practical situations, explain why engineers often design systems to increase the time of interaction instead of maximizing force.

Answer:

Task 3

A 3.0 kg object experiences the force shown in the graph.

Initial momentum = −12 kg·m/s

1. Determine the total (net) impulse acting on the object.

Answer:

2. Calculate the final momentum and final velocity.

Answer:

3. Determine whether the object continues in the same direction or changes direction. Explain using calculations and the graph.

Answer:

4. Explain why considering both positive and negative areas in a force-time graph is important.

Answer:

5. A large force acts on the object for a short time in one direction, while a smaller force acts for a longer time in the opposite direction.

Explain how the object could still end up moving in the direction of the smaller force.

Answer:

6. In real interactions (such as braking or collisions), explain why the direction of impulse is as important as its magnitude.

Answer:

Student Feedback:

I felt confident with:	I struggled with:	I would like more practice with: