

Forces and their effects

OxfordAQA International GCSE Physics 9203 forces full package

1. Forces and their effects

Forces and their effects

Every push, pull and hold in the world is a force — and OxfordAQA's first topic organises them: contact and non-contact interactions, scalars against vectors, Newton's three laws, vehicle safety, and the P-extension ideas of momentum, terminal velocity, centre of mass and moments

OxfordAQA International GCSE Physics 9203, topic 3.1 (Version 5.1, exams 2018 onwards)

2. Forces and their interactions

Forces and their interactions

Objects interact by non-contact field forces (gravity, electrostatics, magnetism) and contact forces (friction, air resistance, tension, normal contact force)

Friction acts between two surfaces, impedes motion and may heat them; air resistance is friction with a fluid

3. Motion and Newton's laws

Motion and Newton's laws

Speed is the gradient of a distance–time graph; velocity adds direction: $v = s/t$ (usable for average speeds too)

Acceleration is the rate of change of velocity: $a = \Delta v/t$ — from the gradient of a velocity–time graph, whose area gives distance travelled

4. (P) Momentum, safety and terminal velocity

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$$p = m \times v \quad F = \frac{\Delta p}{t}$$

Momentum is conserved in a closed system — collisions and explosions share a fixed total

5. (P) Centre of mass and moments

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The centre of mass is where an object's mass may be thought concentrated; a freely suspended object rests with it below the suspension point, and a symmetrical object's centre of mass lies on the axis of symmetry

Find it for an irregular lamina by suspending it from two points and drawing plumb lines

Check yourself

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Work each checklist line against the worked examples named in the handout.

Redo any line you cannot close without the handout open.