

Revision

OxfordAQA · International GCSE · Physics

Original open focus revision; complete specification coverage remains unfinished.

1 Motion graphs and acceleration

- velocity
- acceleration

oxford aqa igcse physics · motion · open · 1

What does area under a velocity-time graph represent?

- Displacement
- Acceleration
- Mass

Available marks: 2.

Worked answer

Displacement

- The gradient of a displacement-time graph is velocity. The area under a velocity-time graph gives displacement. A constant-acceleration formula is valid only when its assumption is justified.

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Velocity changes from 3 to 15 metres per second in 6 s. Find acceleration.

Available marks: 4.

Worked answer

2 m/s^2

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

Negative velocity indicates direction under the chosen sign convention; it does not necessarily mean slowing down.

2 Forces, momentum and safe stopping

- momentum
- resultant force

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For fixed momentum change, which reduces average stopping force?

- Longer stopping time
- Shorter stopping time
- Ignoring external force

Available marks: 2.

Worked answer

Longer stopping time

- Impulse equals momentum change. Increasing stopping time for the same momentum change reduces average force. Identify external forces before applying momentum conservation.

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A 2 kg trolley travels at 3 metres per second. Find its momentum.

Available marks: 4.

Worked answer

6 kg · m/s

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

Balanced forces do not require the object to be at rest. Mass and weight have different units and meanings.

3 Energy stores, work and efficiency

- power
- efficiency

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What happens to kinetic energy when speed doubles at fixed mass?

- It doubles
- It quadruples
- It stays constant

Available marks: 2.

Worked answer

It quadruples

- Define the system and useful output before calculating efficiency. Doubling speed quadruples kinetic energy at constant mass. Power describes transfer per time, not total energy.

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A device receives 250 J and gives 150 J useful output. Find efficiency as a percentage.

Available marks: 4.

Worked answer

60 %

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

Efficiency cannot exceed 100% for a properly defined energy balance. Energy dissipated by heating is still conserved.

4 Waves, measurement and refraction

- wavelength
- frequency

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When a wave enters a slower medium, what stays constant?

- Frequency
- Wavelength
- Speed

Available marks: 2.

Worked answer

Frequency

- At a boundary, frequency stays fixed by the source. A change of speed changes wavelength. Refraction follows from speed differences; angles are measured from the normal.

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Frequency is 8 Hz and wavelength is 0.25 m. Find wave speed.

Available marks: 4.

Worked answer

2 m/s

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

The wave frequency does not change simply because the medium changes. A longitudinal wave has oscillations parallel to propagation.

5 Thermal measurements and particle models

- specific heat capacity
- latent heat

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Why can temperature stay constant while a pure substance melts?

- No energy enters
- Energy changes particle arrangement
- The thermometer must be broken

Available marks: 2.

Worked answer

Energy changes particle arrangement

- Temperature relates to particle motion in a model; internal energy includes kinetic and potential contributions. During a change of state, energy can change particle arrangements rather than temperature.

oxford aqa igcse physics · thermal · open · 2

A 2 kg sample with $c=500$ J per kilogram per degree warms by 3°C . Find energy gain.

Available marks: 4.

Worked answer

3000 J

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

A flat section of a heating curve can show a phase change, not absence of energy transfer. Do not substitute temperature for a temperature difference in $E = mc\Delta T$.

6 Gas models and absolute temperature

- absolute temperature
- ideal gas

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For a fixed amount of gas at constant temperature, halving volume does what to pressure?

- Halves it
- Doubles it
- Leaves it unchanged

Available marks: 2.

Worked answer

Doubles it

- State which quantities stay fixed. A pressure-volume relation requires consistent units and a fixed temperature. The kelvin-based temperature ratio is an extension only where the course explicitly specifies it.

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At fixed temperature, pressure is 120 kPa at volume 50 cubic centimetres. Find pressure at volume 30 cubic centimetres.

Available marks: 4.

Worked answer

200 kPa

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

An ideal gas is a model with conditions of validity. Celsius zero is not zero molecular motion, and internal energy is not determined by pressure alone.

7 Current, potential difference and resistance

- current
- potential difference

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How is a voltmeter connected to measure voltage across a resistor?

- In parallel with the resistor
- In series only
- Across the ammeter only

Available marks: 2.

Worked answer

In parallel with the resistor

- Current is the same through components in series. Potential differences add around the series path. In parallel, branches share the same potential difference, while branch currents sum at a junction.

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A component has 12 V across it and carries 0.40 A. Find resistance.

Available marks: 4.

Worked answer

30 Ω

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

Current is not used up by a lamp. A filament heats up, so its resistance need not remain constant as voltage changes.

8 Fields, motors and induction

- induction
- transformer

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Which gives a continuing emf in a coil?

- A constant unchanging flux
- A changing flux linkage
- A nearby stationary magnet in every situation

Available marks: 2.

Worked answer

A changing flux linkage

- Changing field strength, coil area, orientation or relative motion can change flux linkage. Lenz law describes an induced effect opposing the change producing it, consistent with energy conservation.

oxford aqa igcse physics · fields · open · 2

An ideal transformer has $N_p=400$, $N_s=100$ and $V_p=20$ V. Find V_s .

Available marks: 4.

Worked answer

5 V

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

A transformer needs changing magnetic flux; a steady DC input does not provide continuous transformer action. Magnetic field direction is not automatically the direction of force.

9 Nuclear changes and radiation evidence

- half-life
- background radiation

oxford aqa igcse physics · nuclear · open · 1

Which count should be used for source activity?

- Raw source-plus-background only
- Measured count minus background over equal times
- The largest repeated count only

Available marks: 2.

Worked answer

Measured count minus background over equal times

- Subtract background counts measured over the same time interval. Distinguish irradiation from contamination. Shielding, distance and reduced exposure time can reduce risk under a school-controlled procedure.

oxford aqa igcse physics · nuclear · open · 2

An initial source count is 160 per minute. Find it after three half-lives.

Available marks: 4.

Worked answer

20 counts/min

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

An irradiated object is not automatically radioactive. A half-life does not predict the exact decay time of one nucleus.

10 Stellar evolution: initial mass changes the route

- main sequence
- white dwarf

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Which final route is appropriate for the Sun in the school model?

- Red giant followed by white dwarf
- Every star becomes a black hole
- A supernova is required for every star

Available marks: 2.

Worked answer

Red giant followed by white dwarf

- Read a life-cycle diagram as a model of stages and conditions, not a timed film of one star. The Sun is expected to follow the lower-mass route. Fusion combines light nuclei; it differs from fission of a heavy nucleus.

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6 of 30 stars in an illustrative sample are in a chosen stage. Calculate the percentage.

Available marks: 4.

Worked answer

20 %

- Appropriate relation; consistent substitution; correct result; meaningful unit and interpretation.

The Sun is not expected to become a supernova. A diagram does not establish that every massive star makes the same remnant, nor that all stages last the same time.