JAMES HOWARD EDUCATION

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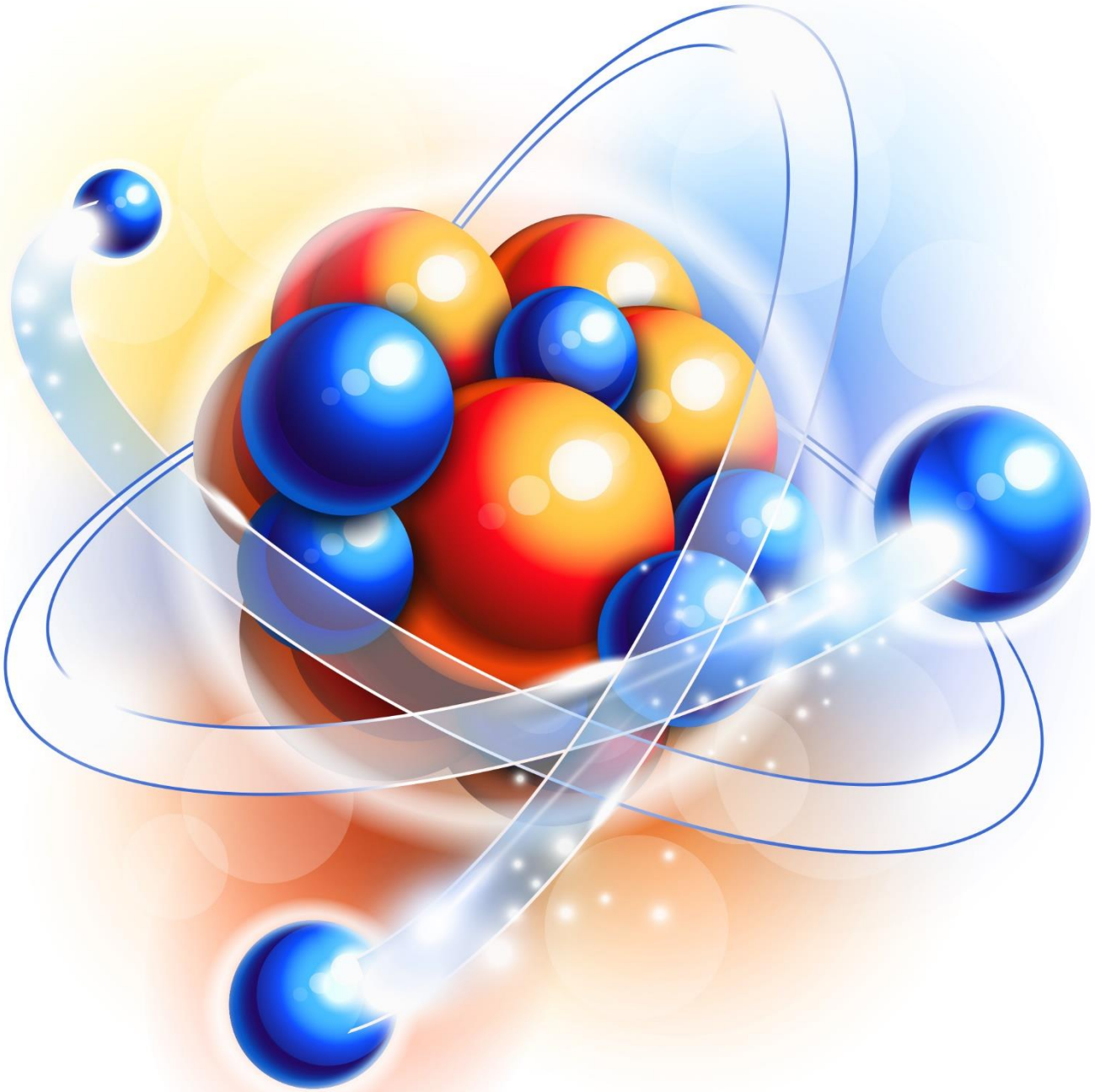
IGCSE Physics Factsheet



Ofsted Registered

JAMES EDUCATION HOWARD
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GCSE & IGCSE Physics (Extended) Factsheet

Contents:

1. Course schedule

Work Programme
GCSE & IGCSE Physics Extended:

Part A
Week 1-3
Unit 1: **Motion, force and energy**
Week 3:
Assessment week of work covered in semester A's weeks 1 to 3
Week 4-6:
Unit 2: Thermal Unit 3: Waves
Week 6:
Assessment week of work covered in semester A's weeks 4 - 6
Part B
Week 7-12
Unit 3: Waves continued Unit 4: Electricity and magnetism Unit 5: Nuclear physics Unit 6: Space physics
Week 12:
Assessment Week of work covered in semester B's weeks 7 - 12
Note: Topics & learning outcomes are included under 'Content Overview'

Weekly course overview

- The academic year has teaching & learning weeks within which you'll be expected to go through
- The programme and order of topics to be covered are listed in the work programme above. You will be working through lessons on the Moodle platform in the order of topics as listed in the work programme.

Assessment & Examination

- For an additional fee you receive:
    - a pack of mock and past papers with once week teams/zoom meetings where a qualifies teacher provides worked solutions

1. Introduction:

Welcome to the GCSE & IGCSE Physics Course.

Unlock Your Potential with Our 12-Week GCSE & IGCSE Revision Course!

Are you aiming to ace your GCSE or IGCSE exams? Look no further! Our meticulously designed 12-week revision course is here to transform your preparation journey, ensuring you master both the course content and the art of exam technique.

2. What We Offer:

- Comprehensive Coverage: Dive into every topic of your syllabus with our extensive asynchronous learning materials. Our course is crafted to cover each knowledge point thoroughly.
- Engaging Video Explanations & Exercises: Learn through engaging short videos and reinforce your understanding with tailored exercises. This dynamic approach guarantees knowledge retention and keeps you actively engaged.
- Interactive Learning Management System: Got a question? Submit it anytime via our user-friendly online platform. Your queries will be addressed in our weekly 45-minute live seminars, fostering a deeper understanding of complex topics.
- Re-watch and Revise: Missed a live session? No worries! All seminars are recorded, allowing you to revisit and review the content as many times as you need throughout the course duration.

3. Two Subscription Options:

1. Standard Access: This option provides full access to our course materials, weekly live seminars, and the ability

to submit questions for personalised feedback.

2. Premium Access: Elevate your revision with our Premium package. This includes everything in the Standard Access, plus:

- Exclusive Past Papers Pack: Receive a curated collection of past papers to practice and perfect your exam skills, with live personalised feedback.
- Additional Weekly Tutorial: Benefit from an extra 45-minute live session each week, focusing on reviewing and correcting mistakes in the practice papers. This targeted and personalised approach ensures you understand common pitfalls and how to avoid them.

4. Why Choose Us?

Our course is more than just a revision guide; it's a comprehensive learning experience designed to build your confidence and knowledge. With a track-record of international success, expert tutors, interactive sessions, and a focus on exam technique, we provide all the tools you need to succeed.

Enroll Now and Take the First Step Towards Exam Success!

Note: The course is designed to cater to a diverse range of learning styles, ensuring that every student can find a path to success. Whether you prefer self-paced learning or interactive sessions, our course adapts to your needs. This work programme is to help guide you throughout the course of the year so that you know what is expected of you andwhat deadlines need to be met. It is important to always refer to this programme as a reminder of the objectives and methodology that needs to be followed.

5. Advantage of doing the GCSE & IGCSE Physics Curriculum:

Key benefits: IGCSE Physics supports learners in building competency, confidence, and fluency in their use of techniques and physics understanding. Cambridge IGCSE Physics helps learners to understand the technological worldin which they live, and take an informed interest in science and scientific developments. Learners will develop their reasoning, problem-solving and analytical skills in a variety of abstract and real-life contexts. IGCSE Physics provides a strong foundation of physics knowledge and scientific skills which is essential for candidates studying physics at a higher level and progression to AS & A Level. The course is tiered to allow all candidates to achieve and progress in their physics studies.

6. Aims

The aims describe the purposes of a course based on this syllabus. The aims are to enable students to:

- acquire scientific knowledge and understanding of scientific theories and practice
- develop a range of experimental skills, including handling variables and working safely

• use scientific data and evidence to solve problems and discuss the limitations of scientific methods
• communicate effectively and clearly, using scientific terminology, notation and conventions
• understand that the application of scientific knowledge can benefit people and the environment
• enjoy science and develop an informed interest in scientific matters which support further study.

7. Content overview & learning outcomes

The subject content is organized by topic:

Topics	Suggested time allocated (hrs)	Revision Session
1. Motion, forces andenergy	30	2
2. Thermal physics	13	1
3. Waves	23	2
4. Electricity and magnetism	35	2
5. Nuclear physics	10	1
6. Space physics	14	1
Total Sessions	**125**	**9**

Curriculum to be covered

1. **Motion, forces and energy**

1.1 Physical quantities and measurement techniques
1.2 Motion
1.3 Mass and weight
1.4 Density
1.5 Forces
  1.5.1 Effects of forces
  1.5.2 Turning effect of forces
  1.5.3 Centre of gravity
1.6 Momentum
1.7 Energy, work and power
  1.7.1 Energy
  1.7.2 Work
  1.7.3 Energy resources
  1.7.4 Power
1.8 Pressure

2. Thermal physics

2.1 Kinetic particle model of matter
- 2.1.1 States of matter
- 2.1.2 Particle model
- 2.1.3 Gases and the absolute scale of temperature

2.2 Thermal properties and temperature
- 2.2.1 Thermal expansion of solids, liquids and gases
- 2.2.2 Specific heat capacity
- 2.2.3 Melting, boiling and evaporation

2.3 Transfer of thermal energy
- 2.3.1 Conduction
- 2.3.2 Convection
- 2.3.3 Radiation
- 2.3.4 Consequences of thermal energy transfer

3. Waves

3.1 General properties of waves
3.2 Light
- 3.2.1 Reflection of light
- 3.2.2 Refraction of light
- 3.2.3 Thin lenses
- 3.2.4 Dispersion of light

3.3 Electromagnetic spectrum
3.4 Sound

4. Electricity and magnetism

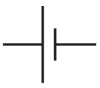
4.1 Simple phenomena of magnetism
4.2 Electrical quantities
- 4.2.1 Electric charge
- 4.2.2 Electric current
- 4.2.3 Electromotive force and potential difference
- 4.2.4 Resistance
- 4.2.5 Electrical energy and electrical power

4.3 Electric circuits
- 4.3.1 Circuit diagrams and circuit components
- 4.3.2 Series and parallel circuits
- 4.3.3 Action and use of circuit components

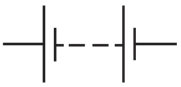
4.4 Electrical safety
4.5 Electromagnetic effects
- 4.5.1 Electromagnetic induction
- 4.5.2 The a.c. generator
- 4.5.3 Magnetic effect of a current
- 4.5.4 Force on a current-carrying conductor

7. Glossary: Physics Notations

Electrical symbols:

cell 

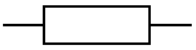
battery of cells 

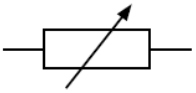
or 

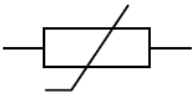
power supply 

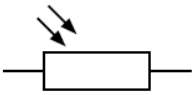
d.c. power supply 

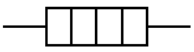
a.c. power supply 

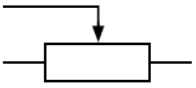
fixed resistor 

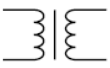
variable resistor 

thermistor 

light-dependent resistor 

heater 

potential divider 

transformer 

magnetising coil 

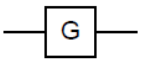
switch 

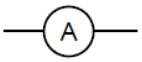
earth or ground 

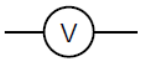
junction of conductors 

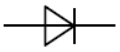
lamp 

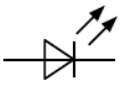
motor 

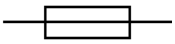
generator 

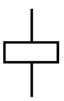
ammeter 

voltmeter 

diode 

light-emitting diode 

fuse 

relay coil 

Symbols and units for physical quantities:

Core			Supplement		
Quantity	***Usual symbol***	***Usual unit***	***Quantity***	***Usual symbol***	***Usual unit***
length	*l, h, d, s, x*	km, m, cm, mm			
area	*A*	m^2, cm^2			
volume	*V*	m^3, cm^3, dm^3			
weight	*W*	N			
mass	*m, M*	kg, g	mass	*m, M*	mg
time	*t*	h, min, s	time	*t*	ms, µs
density	*ρ*	g/cm^3, kg/m^3			
speed	*u, v*	km/h, m/s, cm/s			
acceleration	*a*	m/s^2			
acceleration of free fall	*g*	m/s^2			
force	*F*	N			
gravitational field strength	*g*	N/kg			
			spring constant	*k*	N/m, N/cm
			momentum	*p*	kg m/s
			impulse		N s
moment of a force		N m			
work done	*W*	J, kJ, MJ			
energy	*E*	J, kJ, MJ, kW h			
power	*P*	W, kW, MW			
pressure	*p*	N/m^2, N/cm^2	pressure	*p*	Pa
temperature	*θ, T*	°C, K			

Core			Supplement		
Quantity	***Usual symbol***	***Usual unit***	***Quantity***	***Usual symbol***	***Usual unit***
			specific heat capacity	c	J/(g °C), J/(kg °C)
frequency	f	Hz, kHz			
wavelength	λ	m, cm	wavelength	λ	nm
focal length	f	m, cm			
angle of incidence	i	degree (°)			
angle of reflection	r	degree (°)			
angle of refraction	r	degree (°)			
critical angle	c	degree (°)			
			refractive index	n	
potential difference/ voltage	V	V, mV, kV			
current	I	A, mA			
e.m.f.	E	V			
resistance	R	Ω			
charge	Q	C			
count rate		counts/s, counts/minute			
half-life		s, minutes, h, days, weeks, years			
			Hubble constant	H_0	s^{-1}