GrindSpot
ONLINE GRINDS PLATFORM

LEAVING CERT 2027

LEAVING CERT PHYSICS

Exam Ready

Dyslexia friendly
large, clear text · room to write

Ordinary Level · New course · Workbook A

Built on the new Leaving Cert Physics course and the SEC sample papers, with 9 years of past papers: what comes up, how it's marked, and the practice to nail it.

- **9** years of exam trends, topic by topic
- **56** topic drills with answers
- **1** full practice paper, 300 marks
- ✓ every answer worked out step by step



Know what's coming.
Walk in ready.

Original GrindSpot material written in the style of the Leaving Certificate examination. Not an official SEC paper.

What comes up

2017 to 2026

Every Ordinary Level question of the **old course**, 2017 to 2026, by topic: a guide to what examiners like to ask. 2020 is left out (calculated grades; only a few sat a deferred exam). 12 questions a year to 2019, 14 from 2021. The table shows the topics still on the course; questions with a part that is no longer examined are counted in the last box below. We counted a topic for a question when at least one of its parts could not be answered without it.

	2017	2018	2019	2021	2022	2023	2024	2025	2026	Years
Light and optics	3	3	3	4	6	5	4	3	4	9/9
Circuits and semiconductors	4	3	3	4	3	3	3	4	3	9/9
Forces, momentum and pressure	2	3	3	4	3	4	4	3	2	9/9
Heat	3	3	3	2	3	3	4	2	2	9/9
Waves, sound and Doppler	2	3	2	3	3	2	3	3	4	9/9
Motion and vectors	3	1	1	2	2	3	3	2	2	9/9
Work, energy, power and springs	2	2	2	2	2	4	1	2	2	9/9
Electric charge and fields	2	1	1	3	1	3	2	2	2	9/9
Radioactivity and nuclear energy	2	2	2	1	2	2	2	1	1	9/9
Electrons, photons and atoms	1	2	1	2	1	1	2	2	2	9/9
Magnetism and induction	2	2	1	2	1	1	1	2	2	9/9
Gravity and circular motion	2	–	1	2	1	–	1	–	2	6/9

Darker = more questions. Source: State Examinations Commission papers, 2017 to 2026, read and grouped by GrindSpot. Every question we counted is listed at **grindspot.ie/exam-trends**. A guide to what has come up, not a prediction of what will.

Light leads. Light and optics: 35 of the 120 questions; circuits: 30.

Forces, heat and waves every year. Forces: 28 questions; heat: 25; waves and sound: 25.

Particle physics is new. It never came up at Ordinary Level before. Sample paper 1, Q7(c), asks about quarks, leptons and the positron.

Old course only. 18 of the 120 questions had a part that is no longer examined (moments, Boyle's law, capacitors…). They are not a row in the table.

TOPIC 1

Motion & forces

Worked answers →

In the real exam

2 to 5 questions a paper on the old course (32 in the 9 papers), 2017 to 2026: new sample papers: paper 1, Q5; paper 2, Q6.



Fionn's tip: Change km h^{-1} to m s^{-1} by dividing by 3.6. For $F = ma$, F is the **resultant** force, in newtons.

1. A car on the M50 travels at 90 km h^{-1}. Change this speed to m s^{-1}.

2. Zainab starts from rest on her bike and reaches 6.0 m s^{-1} in 4.0 s. Find her acceleration and the distance she travels in that time.

3. State Newton's first law of motion, and use it to explain why passengers in a car should wear seat belts.

Question 4 (50 marks)

Light is used in broadband cables, cameras and the laboratory.

(a) Explain what is meant by refraction of light.

(b) In an experiment to verify Snell's law, a student measured the angle of refraction r in a glass block for different angles of incidence i:

i (°)	20	30	40	50	60
r (°)	13.2	19.5	25.4	30.7	35.3

(i) Calculate sin i and sin r for each pair.

(ii) Draw a graph of sin i against sin r on the graph paper on your first answer page for this question.

(iii) Use the slope of your graph to find the refractive index of the glass.

(c) Light inside this glass meets the surface with air at an angle of incidence of 60°. The critical angle is 42°. Is the light refracted out into the air, or totally internally reflected? Draw a tick in one box only and justify your answer.

☐ refracted out ☐ totally internally reflected

(d) Broadband signals travel along optical fibres.

(i) Name the effect that keeps light inside an optical fibre.

(ii) Draw a diagram to show it (a drawing box is on your second answer page).

(e) A camera lens is a converging lens of focal length 5.0 cm. A person stands 2.0 m (200 cm) from it. Calculate the distance from the lens to the image.

(f) White light passes through a glass prism.

(i) Name what happens to it.

(ii) Which colour is bent the most? Draw a tick in one box only.

☐ red ☐ green ☐ violet

Each part shows the method, the answer and its marks, with GrindSpot's own guide to part marks, point by point (not an official scheme: the SEC has not published one for the new course). As in the SEC physics schemes up to 2026, marks go to key points; take 1 mark off a point for each slip or missing unit.

Question 1 (50 marks)

(a) (i) X-rays.

(ii) 3.00×10^8 m s^{-1}.

(iii) $v = f\lambda = 20 \times 17$.

340 m s^{-1}

10 marks: (i) **3** · (ii) **3** · (iii) formula **2** · answer with unit **2**

(b) (i) $72 \div 3.6 = 20$ m s^{-1}.

(ii) $a = (v - u)/t = (0 - 20)/4.0 = -5.0$ m s^{-2}, a deceleration of 5.0 m s^{-2}.

(iii) A vector.

20 m s^{-1}; 5.0 m s^{-2}

10 marks: (i) **3** · (ii) formula **2** · answer with unit **2** · (iii) vector **3**

(c) (i) The heat energy needed to raise the temperature of 1 kg of a substance by 1 K (1 °C).

(ii) $Q = mc\Delta\theta = 0.50 \times 4200 \times 30$.

63 000 J

10 marks: (i) definition **4** · (ii) formula with values **3** · answer with unit **3**

(d) (i) $10 + 10 = 20\ \Omega$.

(ii) $1/R = 1/10 + 1/10 = 2/10$, $R = 5\ \Omega$.

(iii) The coulomb (C).

20 Ω; 5 Ω; coulomb

10 marks: (i) **4** · (ii) **4** · (iii) **2**

(e) (i) $^{226}_{88}\text{Ra} \rightarrow {}^{222}_{86}\text{Rn} + {}^{4}_{2}\text{He}$ (226 − 4 = 222; 88 − 2 = 86).

(ii) A Geiger–Müller tube.

(iii) Handle sources with tongs; keep them in a lead box; never point them at anyone.

222 and 86

10 marks: (i) each number 2 + 2 = **4** · (ii) detector **3** · (iii) precaution **3**