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Year 10 Overview 2023-24 – *Physics*

Date	Wk	Week	Units Studied & Learning Outcomes	Key Concepts & Assessment
8 weeks (12 Lessons) (38 Days)				
Tues 5-Sep	A	1	Overview of Unit/No. lessons • Forces and Motion (12 Lessons) Lesson **Sequence** of Content: 1 – Speed (1 lesson) 2 – Distance-time graphs (1 lesson) 3 - Velocity and acceleration (1 lesson) 4/5 - Velocity-time graphs (2 lessons) 6 - Stopping distances (1 lesson) 7 - Investigating friction (1 lesson) 8 - Balanced and unbalanced forces (1 lesson) 9 - Newton's Laws (1 lesson) 10 - F=ma (1 lesson) 11/12 – F = ma required practical (2 lessons)	•
11-Sep	B	2		
18-Sep*	A	3		
25-Sep	B	4		
2-Oct	A	5		
9-Oct	B	6		
16-Oct	A	7		
23-Oct	B	8		

Prior	Current	Next
Y7 Forces - friction, distance-time graphs, speed calculations	Apply forces with further equations and introducing acceleration calculations Application of knowledge into F=ma equation	Momentum – Y11 Y12/13 Turning points in physics

- Unit Learning Outcomes

GW: Recall the speed equation, State what the gradient of a distance-time graph & velocity time graph represents, Explain the difference between the velocity and speed of an object, Know the definitions for thinking and braking distance, calculate resultant force

BI: Collect data and analyse to determine the speed using the equation, Explain the motion of an object from a distance-time & time-velocity graph, Calculate the acceleration of an object from its velocities and time, List the factors that affect thinking & braking distance, Know the effect of a resultant force and zero resultant force

EW: Re-arrange the speed and acceleration equation, Compare the speed of different objects using the gradient of a distance-time graph (HT), Calculate the distance an object travels from a velocity-time graph (HT), Explain the factors that affect thinking & braking distance, Apply your knowledge of resultant forces to real life examples

- GCSE/Exam Links

  Application of equations to calculate data, multi-step calculations, interpret graphical data, recall and apply knowledge.

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Half-Term			7 weeks (10-11 lessons) (34 Days)	
6-Nov	A	9	Overview of Unit/No. lessons Forces and motion (2 lessons) Particles and energy (2-3 lessons) ST1 exam preparation, sitting and feedback (6 lessons) • Lesson **Sequence** of Content: 1/2 – Forces on falling objects and terminal velocity (2 lessons) 3/4 – Specific heat capacity (2-3 lessons, including Req Prac) 5/6/7 – ST1 exam revision (3 lessons) 8/9/10 – sitting ST1 exams and exam feedback (3 lessons)	
13-Nov	B	10		
20-Nov	A	11		
27-Nov	B	12		
4-Dec	A	ST1		
11-Dec	B	ST1		
18-Dec	A	15		

Prior	Current	Next
Y7 Forces Yr7 particles and energy	Apply forces with further equations and introducing terminal velocity Understanding of changes of state	Y12/13 Turning points in physics, projectile motion Yr10 – Latent heat

GW: Identify forces acting on a falling object/Be able to use the equation to calculate specific heat capacity

• BI: Describe how the resultant force acting on a falling object changes and how this affects the motion of the object/give a definition of specific heat capacity

• EW: Describe the change in motion/resultant forces on a falling object from a v-t graph/ Describe a practical to find the specific heat capacity of a material

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Christmas Holiday			6 weeks (9 lessons) (30 Days)	
8-Jan	B	16	Overview of Unit/No. lessons Particles and energy (6 lessons) Magnetism and Electromagnetism (2 lessons) Lesson **Sequence** of Content: 1/2 – Internal energy and latent heat (2 lessons) Lenses – separates (4 lessons) 3 – Kinetic energy (1 lesson) 4 – Gravitational potential energy (1 lesson) 5 – Elastic Potential energy ***Include Hooke's Law Practical** (This Yr only) (2 lesson) 6 – Work done and power (1 lesson) 7 – Weight (1 lesson) 8 – Magnetism (1 lesson)	
15-Jan	A	17		
22-Jan	B	18		
29-Jan	A	19		
5-Feb	B	20		
12-Feb	A	21		

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			9 – Electromagnets (1 lesson)

Prior	Current	Next
Year 8 – chemical reaction Year 9 – reactions of metals	Explain how factors affect the rate of reaction Describe ways to measure rate of reaction	Year 12 – rate of reaction

- **GW**: Identify some factors that affect rate of reaction
- **BI:** Describe how different factors affect the rate of reaction
- **EW**: Explain how the different factors affect the rate of reaction using the collision theory

Half-Term			5 weeks (7 - 8 lessons) (24 Days)
26-Feb	B	22	Overview of Unit/No. lessons Motor effect (HT) (1-2 lessons) Momentum (HT) (2-3 lessons) Motors/Atoms and radiation (4 lessons) Lesson **Sequence** of Content: Electromagnetic induction, generators and induction – separates (3 lessons) 1/2 - The motor effect – HT (2 lessons) 3/4 - Momentum – HT (2 lessons) Vector diagrams - HT EXTRA: REFRACTION (Check – should have been done Yr9)) & WAVE FRONT DIAGRAMS (HT) 5/6 - Structure and history of the atom (2 lessons) 7 - Types of radiation (1 lesson) 8 - Measuring radiation (1 lesson)
4-Mar	A	23	
11-Mar	B	24	
18-Mar	A	25	
25-Mar*			
	B	26	

Prior	Current	Next
Y8, 9 – Atomic structure Y8 – Magnetism Y7 – Forces (e.g. gravity) Y7 – Energy	Further detail on electron arrangements and history of the development of an atomic model (plum pudding, nuclear model) Types of radiation, uses and dangers Calculating force on magnetic current (F=BIL)	Y12 – Particles and radiation Y11 – Electricity –

- GW: Demonstrate what 'Fleming's left hand rule' represents, Calculate the momentum of an object of a known mass and velocity, Describe what a transformer and generator do, Name, describe and explain properties of sub atomic particles and locate parts of the atom, identify the two models

of the atom, Name the 3 types of radiation and their uses, Describe the types of nuclear decay

- BI: Use F = BIL for a conductor at right angles to a magnetic field and carrying a current, Explain that momentum is conserved in any collision in a closed system, Describe how a transformer and generator work, Understand the difference between atomic mass and atomic number, Explain the difference between the nuclear and plum pudding model of the atom, Explain what isotopes and ions are, Describe the 3 types of radiation and evaluate their uses

- EW: Explain how the force on a conductor in a magnetic field causes the rotation of the coil in an electric motor, Apply and rearrange the appropriate momentum equation, Explain how AC current is generated and how transformers work, Calculate proton, electron and neutron numbers for various elements, explain Rutherford's scattering experiment, Describe and explain properties of each type of radiation and explain the use of different sources

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Easter Holiday			6 weeks (9 lessons) (29 Days)
15-Apr	A	27	**Overview of Unit/No. lessons** Ionising radiation (5-6 lessons) **Lesson Sequence of Content:** 1/2 - Uses of radiation (2 lessons) 2/3 - Nuclear decay (2 lessons) 4 - Half-life (1 lesson) 5 - Contamination and irradiation (1 lesson) Space – separates (6 lessons) 7/8/9 – ST2 exam revision
22-Apr	B	28	
29-Apr	A	29	
6-May*	B	30	
13-May	A	31	
20-May	B	ST2	

Prior	Current	Next
Atoms and electrons (Y7-9)	Types of nuclear radiation, their uses, dangers and half lives	Y12 – Particles and radiation Year 12/13 – Gravitational fields Classification by temperature, black-body radiation Supernovae, neutron stars and black holes

- GW: Name the 3 types of radiation and their uses, describe the types of nuclear decay, Define the term half-life, Know what is meant by contamination, Describe how helium can be formed, Identify different stages in a start 'life', describe where fission and fusion occur

- BI: Describe the 3 types of radiation and evaluate their uses, Describe how the nucleus of an atom changes with alpha, beta and gamma decay, Describe the random nature of radioactive decay, Know what is meant by irradiation, Describe the stages involved in a star life-cycle, Describe what fission and fusion are

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- EW: Describe and explain properties of each type of radiation and explain the use of different sources, Write balanced equations that show alpha (α) and beta (β) decay., Determine the half-life of a source from a graph or table of data, Be able to explain the difference between contamination and irradiation, Explain how helium is formed and how fusion and fission occur
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Half-Term 7 weeks (10-11 lessons) (35 Days)

3-Jun	A	ST2	Overview of Unit/No. lessons Electricity practical lessons (7-8 lessons) Lesson **Sequence** of Content: 1/2 – Sitting ST2 exams and Feedback 3 – Electrical circuits recap (1-2 lessons) 4/5- Resistance of a wire practical (1-2 lessons) 6-7 – LDR practical (1-2 lessons) 8/9 – Thermistor Practical (2 lessons)
10-Jun	B	ST2	
17-Jun	A	35	
24-Jun	B	36	
1-Jul	A	37	
8-Jul	B	38	
15-Jul	A	39	

Prior	Current	Next
Y 8 – Building circuits and circuit symbols, defining voltage and current	Use of a different component (LDR) and looking at resistance	Y11 – other electrical components in circuits Y12/13 – Electricity - current-voltage characteristics, resistivity, circuits Y12/13 – Further mechanics

- GW: Identify variables in the LDR experiment and thermistor experiment
- BI: Describe how resistance changes with light intensity and temperature
- EW: Explain uses of an LDR and thermistor
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(Total: 190 Days)

* Bank Holidays

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Please revisit the prompts from last year:

- What are the Key concepts for this unit?
- How will it link to wider disciplinary knowledge/cultural capital: history, culture, authentic artefacts, music, art, literature?
- How does it build on prior knowledge and link to other units, concepts, years, GCSE?
- What is it intended students will have learned?
  - For each Unit? By the end of the Year?
    - GW: ; BI: ; EW
- Is it worth summarising in a knowledge organiser?

- **Assessment: how do you know they have learned the foundational concepts, curriculum and wider disciplinary knowledge? Does assessment look like GCSE light? Should it?**
- Skills used/learned
- Tier 2/3 vocabulary ((Etymology e.g. of Greek/Latin)