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Year 10 Overview 2024-25 – *Physics*

Date	Wk	Week	Units Studied & Learning Outcomes	Key Concepts & Assessment
8 weeks (12 Lessons) (38 Days)				
2-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)	**Foundational concepts:** Force and motion **WALTs:** • Solve problems by rearranging the speed equation • Describe a journey by interpreting the slopes of a distance time graph • Calculate the speed of an object on a distance time graph (HT) • Solve problems by rearranging the acceleration equation • Interpret the gradient of velocity-time graphs. Calculate acceleration from velocity time graphs • Calculate the distance travelled from a velocity time graph (HT) • Know the factors that affect the braking distance and thinking distance • Investigate the factors that affect friction • Understand and calculate resultant forces • Describe qualitatively the effects of forces on objects • Investigate the relationship between force, mass and acceleration **Tier 2/3 Vocabulary** • Glossaries, quick quizzes, within exam questions, PowerPoints. • **Key words**: Acceleration, deceleration, distance, gradient, constant, reaction time, balanced, unbalanced, equal, opposite, air resistance, resultant, motion, state, height, mass, kinetic, force **Links to root words (etymology):** O Motion – to move o Kinetic – to move o Resultant – result of o Acceleration – accelerat – 'hastened' **Misconceptions:** Thinking everything that moves will eventually come to a stop and that rest is the "natural" state of all objects **History & Culture:** • Changing views on impact of drink-driving and other influences. • Our understanding of acceleration is due to the work of two great scientists, Italian physicist Galileo Galilei (1564–1642) and English physicist Isaac Newton (1642–1727). • During the late sixteenth and early seventeenth centuries, Galileo first observed the motion of objects rolling down an inclined plane. **Careers:** Aerospace engineering, car design and engineering ballistics **EDI:** • Scientists from different backgrounds, nationalities
9-Sep	B	2		
16-Sep*	A	3		
23-Sep	B	4		
30-Sep	A	5		
7-Oct	B	6		
14-Oct	A	7		
21-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.

Recall and apply knowledge, carry out and evaluate practical method, use of equations (multi-step calculations), rearranging equations, evaluate evidence, draw conclusions from evidence

Assessment:
- Quick quiz
- Exam style questions
- Q&A

Interleaving

- An acceptance of alternative theories of gravity (e.g. Newton, Einstein, Gravitational Wave Theory)
- Road safety and older drivers

Half-Term — **7** weeks (10-11 lessons) (35 Days)

4-Nov	A	9
11-Nov	B	10
18-Nov	A	11
25-Nov	B	12
2-Dec	A	13
9-Dec	B	14
16-Dec	A	15

<u>Overview of Unit/No. lessons</u>
Forces and motion (4 lessons)
Particles and energy (6 lessons)

<u>Lesson **Sequence** of Content</u>:
1/2 – Forces on falling objects and terminal velocity (2 lessons)
3/4 – Specific heat capacity (2-3 lessons, including Req Prac)
5/6 – Internal energy and latent heat (2 lessons)
Lenses – separates (4 lessons)
7 – Kinetic energy (1 lesson)
8 – Gravitational potential energy (1 lesson)
9/10 – Elastic Potential energy and Hooke's Law practical (2 lesson)

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

Recall and apply knowledge, carry out and evaluate practical method, use of equations (multi-step calculations), rearranging equations, evaluate evidence, draw conclusions from evidence.

Assessment:
- Quick quiz
- Exam style questions
- Q&A

Interleaving

Foundational concepts:
Forces and motion

<u>WALTs</u>:
• Explain the motion of an object falling through a fluid
• Identify the effects of forces in situations where bodies move through fluids
• Draw and interpret v-t graphs for falling objects
- Know how to calculate the specific heat capacity of a material, mathematically and practically
- Understand what is meant by refraction and be able to draw a wave front diagram
- Know how to complete ray diagrams for a converging and diverging lens
- Know how to draw accurate ray diagrams for a converging lens
- Know uses of converging and diverging lenses
- Know the structure of the human eye
- Know how lenses can be used to correct vision defects
- Know what is meant by latent heat
- Know the formula involving latent heat
- Calculate kinetic energy from velocity and mass
- Calculate gravitational potential energy

<u>Tier 2/3 Vocabulary</u>:
• Glossaries, quick quizzes, within exam questions, PowerPoints.

Key words:
Force, mass, acceleration, balanced, unbalanced, terminal velocity, fluid, air resistance, gravity, resultant

Links to root words (etymology):
Acceleration – accelerat – 'hastened'
Terminal – terminus – end, boundary

Misconceptions:
Thinking that heavier objects fall faster because they experience less air resistance

History & Culture:
• In fluid dynamics, the drag equation is a formula used to calculate the force of drag experienced by an object due to its movement through a fully enclosing fluid, and used to calculate terminal velocity of movement in fluids. The equation is attributed to Lord Rayleigh (1842–1919).

Careers:
Ballistics, aerospace engineering

EDI:
• Scientists from different backgrounds, nationalities

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	• 12th century Islamic philosopher Abu'l-Barakāt al-Baghdādi first proposed an explanation of the acceleration of falling bodies • Austrian skydiver Felix Baumgartner achieved the fastest terminal velocity reached by a human (2012)

Christmas Holiday 6 weeks (9 lessons) (30 Days)

6-Jan	B	16	Overview of Unit/No. lessons Particles and energy (2 lessons)
13-Jan	A	17	Magnetism and Electromagnetism (2 lessons)
20-Jan	B	18	Motor effect (HT) (1-2 lessons)
27-Jan	A	19	Momentum (HT) (2-3 lessons)
3-Feb	B	20	Lesson **Sequence** of Content: 1 – Work done and power (1 lesson) 2 – Weight (1 lesson) 3 – Magnetism (1 lesson) 4 – Electromagnets (1 lesson) Electromagnetic induction, generators and induction – separates (3 lessons) 5/6 - The motor effect – HT (2 lessons) 7/8/9 - Momentum – HT (2 lessons) And Vector diagrams (1 lesson) – HT FT could revise paper 2 topics ahead of ST1 for lessons 5-9
10-Feb	A	21	

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

Foundational concepts:
Waves, Particles and Energy

WALTs:

- Know the equation for work done and weight
- Know how to find the magnetic field of a bar magnet
- Know the factors that can affect the strength of an electromagnet.
- Know how an AC generator works
- Understand how transformers work
- Know what the motor effect is and Flemings left hand rule (HT)
- Be able to explain what is meant by momentum and how it is related to mass and velocity (HT)
- Resolve a single force into two components (HT)

Tier 2/3 Vocabulary
- Glossaries, quick quizzes, within exam questions, PowerPoints.

Key words:
Internal, energy, latent heat, store, kinetic, gravitational potential, elastic potential, work done, power, weight, mass,

Links to root words (etymology):
- Latent – 'being hidden'
- Magnet - *magnēs lithos* – lodestone, rock discovered to attract certain metallic items
- Solenoid - *sōlēn* - channel, pipe
- Repulse – *Repuls* – Driven back

Misconceptions:
- Thinking energy and force are the same
- Work - They find this hard! From the non-scientific point of view, "work" is synonymous with "labour"
- Thinking all metals are attracted to a magnet
- Thinking larger magnets are always stronger than smaller magnets

History & Culture:
- Links to geographical/cultural differences in lens usage
- British scientist William Sturgeon invented the electromagnet in 1824. His first electromagnet was a horseshoe-shaped piece of iron that was wrapped with about 18 turns of bare copper wire

Careers:
Ophthalmics, electrical engineering

EDI:

various elements, explain Rutherford's scattering experiment, Describe and explain properties of each type of radiation and explain the use of different sources Recall of knowledge, application of knowledge, interpret data, analyse results, carry out practical procedures, write practical methods **Assessment:** • Quick quiz • Exam style questions • Q&A • Interleaving • Practical skills • Interpretation & evaluation skills Data analysis skills				• Scientists from different backgrounds, nationalities • Christiane Bonnelle, French physicist and pioneering spectroscopist • Lucy Wilson (1880-1980), theories of vision, optics and spectroscopy • Huang Lu (1769-1829), Chinese optics inventor • Chinese polymathic scientist Shen Huo was the first to describe the magnetic needle compass in 1088, pioneered work in magnetism • James West – co-inventor of microphone • Michael Faraday – apprentice to book binder at age 14
Half-Term			6 weeks (9 lessons) (29 Days)	
25-Feb	B	22	INSET 24th Feb <u>Overview of Unit/No. lessons</u> Atoms and radiation (6 lessons) <u>Lesson **Sequence** of Content</u>: 1/2 - Structure and history of the atom (2 lessons) 3 - Types of radiation (1 lesson) 4 - Measuring radiation (1 lesson) 5/6 - Uses of radiation (2 lessons) 7/8/9 – ST1 exam revision (3 lessons) • 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 • 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	**Foundational concepts:** Particles, Nuclear, Space and Weight **<u>WALTs:</u>** • Know the structure of the atom • Know the history of the atomic model • Know the three types of radiation and their properties • Know some different uses of radioactivity and understand how they work **Tier 2/3 Vocabulary** • Glossaries, quick quizzes, within exam questions, PowerPoints. **<u>Key words:</u>** Alpha, beta, gamma, electron, neutron, emit, deflect, nucleus, charge, electromagnetic, penetrate, ionise, , exposure, magnetic/electric field, absorbed, decay, gravity, nebula, protostar, main sequence, temperature, red giant, supergiant, white dwarf, black dwarf, neutron star, black whole, galaxy, stars, energy **Links to root words (etymology):** • Irradiation - *Irradiat*; shine up on • Contaminate; - *contaminat - make impure* **Misconceptions:** Thinking that all radiation is harmful **<u>History & Culture:</u>** • Links to nuclear power station disasters (Chernobyl) and impact, changing views of nuclear power, nuclear waste disposal, nuclear weapons testing and impact • A major goal of nuclear research in the mid-1950s was to show that nuclear energy could produce electricity for commercial use. The first commercial electricity-generating plant powered by nuclear energy was located in Shippingport, Pennsylvania. It reached its full design power in 1957. **<u>Careers:</u>**
3-Mar	A	23		
10-Mar	B	24		
17-Mar	A	25		
24-Mar	B	26		
31-Mar				
	A	ST1		

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			Recall of knowledge, application of knowledge, interpret data, analyse results, carry out practical procedures, write practical methods, recall equations, rearrange equations, complete multi-step calculations **Assessment:** • Quick quiz • Exam style questions • Q&A • Interleaving • Practical skills • Interpretation & evaluation skills • Data analysis skills Quantitative skills	Astrophysics, astronomy, spacecraft engineering **EDI:** • Scientists from different backgrounds, nationalities • An acceptance of alternative origin of life theories (e.g. Big Bang, Evolution, Creationism) • Katie Bouman helped develop an algorithm to create the first-ever image of a black hole (2019) • Margaret Hamilton wrote the code for the Apollo Project (1969) to put man on the moon • Mae Jemison first black woman to travel into space (1992) • 'Hidden Figures' Mary Jackson, Katherine Johnson and Dorothy Vaughan devised orbital trajectories for putting the first men into space in the 1960s • Sally Ride was first acknowledged gay and female astronaut in space (1983) • Maggie Aderin-Pocock – female space scientist • Famous theoretical physicist Stephen Hawking known for Hawking radiation and multiple black hole theories, diagnosed with MND, continued research despite being paralysed • Jocelyn Bell Burnell – Discovered pulsars • Lisa Meitner – coined the term nuclear fission Enrico Fermi – created first nuclear reactor ***Equality Diversity and Inclusion (EDI) links?*** *Autism and stress awareness month.* *25/4 World Malaria Day* *26/4 Lesbian visibility day* *UK national walking month.* *1/5-7/5 Deaf awareness week* *23/05 Vesak*
Easter Holiday		5 weeks (7-8 lessons) (23 Days)		
22-Apr	B	ST1	Easter Monday 21st Early May bank hol 6/5 <u>Overview of Unit/No. lessons</u> Ionising radiation (4 lessons) **<u>Lesson Sequence of Content</u>:** 1/2/3 – sitting ST1 exams and feedback 4/5 - Nuclear decay (2 lessons) 6 - Half-life (1 lesson) 7 - Contamination and irradiation (1 lesson) Space – separates (6 lessons)	**Foundational concepts:** Particles, Nuclear, Space and Weight **<u>WALTs:</u>** • Understand nuclear decay • Know what is meant by half life • Know the difference between contamination and irradiation • Know how elements heavier than Helium are formed in stars • Know and understand the life cycle of a star • Understand Nuclear fission and fusion • Understand how nuclear fission occurs inside of a nuclear reactor **Tier 2/3 Vocabulary** • Glossaries, quick quizzes, within exam questions, PowerPoints. **<u>Key words:</u>** Alpha, beta, gamma, electron, neutron, emit, deflect, nucleus, charge, electromagnetic, penetrate, ionise, ,
28-Apr	A	ST1		
5-May	B	30		
12-May	A	31		
19-May	B	32		

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
- 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

Recall of knowledge, application of knowledge, interpret data, analyse results, carry out practical procedures, write practical methods, recall equations, rearrange equations, complete multi-step calculations

Assessment:
- Quick quiz
- Exam style questions
- Q&A
- Interleaving
- Practical skills
- Interpretation & evaluation skills
- Data analysis skills

Quantitative skills

exposure, magnetic/electric field, absorbed, decay, gravity, nebula, protostar, main sequence, temperature, red giant, supergiant, white dwarf, black dwarf, neutron star, black whole, galaxy, stars, energy

Links to root words (etymology):
- Irradiation - *Irradiat*; shine up on
- Contaminate; - *contaminat - make impure*

Misconceptions:
Thinking that all radiation is harmful

History & Culture:
- Links to nuclear power station disasters (Chernobyl) and impact, changing views of nuclear power, nuclear waste disposal, nuclear weapons testing and impact
- A major goal of nuclear research in the mid-1950s was to show that nuclear energy could produce electricity for commercial use. The first commercial electricity-generating plant powered by nuclear energy was located in Shippingport, Pennsylvania. It reached its full design power in 1957.

Careers:
Astrophysics, astronomy, spacecraft engineering

EDI:
- Scientists from different backgrounds, nationalities
- An acceptance of alternative origin of life theories (e.g. Big Bang, Evolution, Creationism)
- Katie Bouman helped develop an algorithm to create the first-ever image of a black hole (2019)
- Margaret Hamilton wrote the code for the Apollo Project (1969) to put man on the moon
- Mae Jemison first black woman to travel into space (1992)
- 'Hidden Figures' Mary Jackson, Katherine Johnson and Dorothy Vaughan devised orbital trajectories for putting the first men into space in the 1960s
- Sally Ride was first acknowledged gay and female astronaut in space (1983)
- Maggie Aderin-Pocock – female space scientist
- Famous theoretical physicist Stephen Hawking known for Hawking radiation and multiple black hole theories, diagnosed with MND, continued research despite being paralysed
- Jocelyn Bell Burnell – Discovered pulsars
- Lisa Meitner – coined the term nuclear fission

Enrico Fermi – created first nuclear reactor

Half-Term			7 weeks (10-11 lessons) (34 Days)	
2-Jun	A	33	SJBF INSET 4/7 <u>Overview of Unit/No. lessons</u> Electricity practical lessons (7-8 lessons)	**Foundational Concepts:** Energy and Circuits **<u>WALTs:</u>**
9-Jun	B	34		
16-Jun	A	35		
23-Jun	B	36		

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30-Jun	A	37	Lesson **Sequence** of Content: 1/2 – Electrical circuits recap (1-2 lessons) 3/4 - Resistance of a wire practical (1-2 lessons) 5/6 – LDR practical (1-2 lessons) 7/8 – Thermistor Practical (2 lessons)
7-Jul	B	38	
14-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

Recall of knowledge, application of knowledge, interpret data, analyse results, carry out practical procedures, write practical methods, recall equations, rearrange equations, complete multi-step calculations

Assessment:
- Quick quiz
- Exam style questions
- Q&A
- Interleaving

Quantitative skills

- Identify practically how temperature affects resistance of a thermistor
- Identify practically how light affect resistance of LDR
- Identify practically how the length od wire affects the resistance of the wire

Tier 2/3 Vocabulary:
Glossaries, quick quizzes, within exam questions, PowerPoints

Key words:
Light-dependent resistor, light intensity, resistance, electrons, independent, dependent, control variable

Links to root words (etymology):
- Resistor; resistance; *resistere*; 'hold back'
- Light dependent resistor; resistance depends on the light
- Intensity; intense; *intensus;* 'tightly strained'

History & Culture:
- The idea of a photoresistor developed when photoconductivity in Selenium was discovered by Willoughby Smith in 1873. Many variants of the photoconductive devices were then made.
- The first NTC thermistor was discovered in 1833 by Michael Faraday, who reported on the semiconducting behavior of silver sulfide. Faraday noticed that the resistance of silver sulfide decreased dramatically as temperature increased.

Careers:
Electrical engineering, design engineer, electrician, electrical engineer

EDI:
- Scientists from different backgrounds, nationalities
- Italian Alessandro Volta credited as the inventor of the electric battery (1800s), SI unit of voltage named after him
- Edith Clarke (1883-1959) was the first woman to be professionally employed as an electrical engineer in the US

(Total: 189 Days)

Overview of Year 10	
Based on your Flight Path *(E.g. Targets 1L – 4L)*	**By the end of Year 10, students will have learned**
GW: *(E.g. Grade 1)*	• Recall the speed equation • State what the gradient of a distance-time graph and 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

	• Identify forces acting on a falling object • Be able to use the formula involving specific latent heat • Be able to calculate the kinetic energy of an object • Be able to calculate the GPE of an object • Recall how to calculate the weight of an object • Know the shape of a magnetic field around a bar magnet • Describe how the magnetic effect of a current can be demonstrated • Identify what happens in refraction • Draw ray diagrams • Identity lens types • 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 • 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 • Identify variables in the LDR experiment and thermistor experiment
BI: *(E.g. Grades 2-3M)*	• Collect data and analyse to determine the speed using the equation • Explain the motion of an object from a distance-time and 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 • Describe how the resultant force acting on a falling object changes and how this affects the motion of the object • Explain the shape of a heating/cooling curve • Be able to rearrange the KE equation & GPE equation • Define and give examples of work done • Describe how to carry out a practical to determine the shape of the magnetic field of a bar magnet • Draw the magnetic field pattern for a straight wire carrying a current and for a solenoid • Describe how light changes direction in refraction • Describe what happens to light travelling through lenses • Describe different vision defects • 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 • 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 • Describe how resistance changes with light intensity and temperature

Now that the revised curriculum has been taught, please consider the Implementation and Impact of the curriculum you taught. What changes might need to be made to the Curriculum Intent (See Curriculum Map and Overviews) in light of this year's experiences?

EW: *(E.g. Grades 3U-4L)*	• 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 • Describe the change in motion/resultant forces on a falling object from a v-t graph • Be able to answer questions involving the use of two equations • Link the amount of kinetic energy and GPE to other forms of energy • Calculate work done and rearrange the equation for force and distance • Explain the evidence for the Earth's magnetic field • Explain how a solenoid arrangement can increase the magnetic effect of the current • Explain what happens in refraction • Explain how lenses can correct vision defects • 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 • 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 • Explain uses of an LDR and thermistor

Prompt Questions

Now that the revised curriculum has been taught, please consider the Implementation and Impact of the curriculum you taught. What changes might need to be made to the Curriculum Intent (See Curriculum Map and Overviews) in light of this year's experiences?

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)