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Year 11 Overview 2024-25 – *Physics*

Date	Wk	Week	Units Studied & Learning Outcomes	Key Concepts & Assessment
8 weeks (?? Lessons) (38 Days)				
2-Sep	A	1	Overview of Unit/No. lessons • Forces and motion revision and momentum for higher (7 lessons) • Energy and circuits (5 lessons) Lesson **Sequence** of Content: • Lesson 1 - Revision of Newtons Laws of motion • Lesson 2 – Revision of Motion graphs and motion on a straight line • Lesson 3 – Vector diagrams and resolution of forces (H/Sep) • Lesson 4- 6 – Introduction to momentum and then calculations involving momentum in collisions and explosions • Lesson 7 – Pressure in gases • Lesson 8 – Recap of basic circuits – symbols and series/parallel • Lesson 9 – Investigating Series rules • Lesson 10 – Investigating Parallel rules • Lesson 11 – Using V=IxR and the circuit rules • Lesson 12 – ST2 revision Unit Learning Outcomes: GW BI EW	**Foundational Concepts**: Forces and motion & Energy and circuits • Resolve a single force into two components (HT) • Know how to calculate moments and understand the principle of moments • Explain how a gas causes pressure and how pressure changes with altitude • Know how hydraulic machines work • Know how to calculate pressure • Understand what causes high and low pressure. • Know how hydraulic machines work • Be able to explain how a gas causes pressure and explain how the pressure caused by a gas can change • Know the standard circuit symbols • Know where to place a voltmeter and ammeter in a circuit • Be able to explain what is meant by voltage and know the rules for voltage in series and parallel circuits. • Know what electrical resistance is **Tier 2/3 Vocabulary** • Glossaries, quick quizzes, within exam questions, PowerPoints. **Key words:** Forces, resultant force, pressure, series, parallel, circuit, velocity, ammeter, voltmeter, current, potential difference, resistance **Links to root work (etymology) –** • Momentum – from the latin movimentum, 'to move' • Vector – 'carrier' in latin • Scalar – from latin '*scala*' - 'ladder' • Current from the latin, *currere*, 'run' – defined as the flow of electric charge • Perpendicular – at right angles • Voltage – commonly referred to as 'potential difference' – from the latin, potent/potential – being able/power • Diode – from di (two, for the two different electrodes) - electrode from Greek Hodos – 'way' • Resistance from the latin very *resistere* – 'to hold back' • Force from the latin, *fortis* – 'strong' • Circuit, originates from latin, *'go round'* • Amps/amperes – named after French scientists Andre André-Marie Ampère **History:** • The invention of the battery -- which could produce a continuous flow of current -- made possible the development of the first electric circuits. Alessandro Volta invented the first battery, the voltaic pile, in 1800.
9-Sep	B	2		
16-Sep*	A	3		
23-Sep	B	4		
30-Sep	A	5		
7-Oct	B	ST2		
14-Oct	A	ST2		
21-Oct	B	ST2		

Prior	Current	Next
Y9 Recall the difference between scalar and vector quantities (with examples). Y7 - forces Year 9 – power equation Y 8 – Building circuits and circuit symbols, defining voltage and current	V-I Characteristic graphs – more focus on current flow through different devices Different types of current (AC/DC) Wiring a plug HT: Resolving a force	Y12/13 – Electricity - current-voltage characteristics, resistivity, circuits Y12/13 – Further mechanics

GW - Be able to calculate momentum and know the difference between vectors and scalars

BI - Be able to use the conservation of momentum in collisions and explosions. Drawing vector diagrams

EW – Apply knowledge of momentum in different contexts and resolve pairs of forces

Recall of knowledge, application of knowledge, interpret information, analyse results, carry out practical procedures, write practical methods, write word & chemical equations

Assessment:

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

The very first circuits used a battery and electrodes immersed in a container of water.

- momentum, was actually introduced by the French scientist and philosopher Descartes before Newton.

Careers: applications engineer, data analyst, design engineer, electrician, electrical engineer

Misconceptions:

- mix up velocity and speed
- energy is used up in a circuit

EDI:

- Early awareness of electricity among ancient Egyptians aware of shocks from electric fish.
- Korean-American Dawon Kahng helped invent the metal-oxide-semiconductor field-effect transistor (MOSFET) which has become the most-widely manufactured device in history.

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

Overview/number of lessons:
Circuit calculations and mains (9 lessons)

Lesson Sequence:
Lesson 1 – Introduce the equations P=IV, Q=It, E= QxV
Lesson 2 and 3 – Use the equations above and circuit rules in calculations
Lesson 3/4/5 VI Characteristics
Lesson 6 – Thermistors and LDRs recapped from practical carried out in Year 10
Lesson 7– ACDC and features of mains electricity
Lesson 8 – Wiring a plug
Lesson 9 – Dangers of mains electricity

Separates
Lesson 10 – How objects become charged
Lesson 11 – Electric fields and applications of static electricity

Prior	Current	Next
Y 8 – Building circuits and circuit symbols, defining voltage and current Y7 - forces Year 9 – power equation	V-I Characteristic graphs – more focus on current flow through different devices Different types of current (AC/DC) Wiring a plug HT: Momentum calculations, resolving a force	Y12/13 – Electricity - current-voltage characteristics, resistivity, circuits Y12/13 – Further mechanics

GW – Can use the equations P=IV etc and state the features of a mains plug

Foundational concepts: Energy and circuits

Lesson Outcomes:

- Know how to calculate power, charge and energy in an electrical circuit
- Know the VI characteristics of a diode, filament bulb and resistor
- Know how resistance is affected in thermistors and LDRs with temperature and light intensity
- Know the difference between AC and DC
- Know how to wire a plug
- Understand why mains electricity can be dangerous
- Know how insulated objects can become charged by friction
- Know the shape of electric fields produced by point charges
- Understand how some applications of static electricity work and be able to link this to other uses

Tier 2/3 Vocabulary

- Glossaries, quick quizzes, within exam questions, PowerPoints.

Key words:
Thermistor, current, potential difference, resistance, voltage, fuse, diode, earth wire, live wire,

Links to root words (etymology):

- Current from the latin, *currere*, 'run' – defined as the flow of electric charge
- Perpendicular – at right angles
- Voltage – commonly referred to as 'potential difference' – from the latin, potent/potential – being able/power
- Diode – from di (two, for the two different electrodes) - electrode from Greek Hodos – 'way'

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BI – Combine the circuit rules and the equations to perform calculations on circuits

EW – Can explain why mains electricity can be dangerous. Explain the VI characteristics of diode/resistor and filament bulb

Recall and application of knowledge, interpreting and analysing information and carrying out practical tasks

Recall of knowledge, application of knowledge, interpret information, analyse results, carry out practical procedures, write practical methods, write half equations

Assessment:

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

- Resistance from the latin very *resistere* – 'to hold back'
- Force from the latin, *fortis* – 'strong'
- Circuit, originates from latin, *'go round'*
- Amps/amperes – named after French scientists Andre André-Marie Ampère

History:

- The invention of the battery -- which could produce a continuous flow of current -- made possible the development of the first electric circuits. Alessandro Volta invented the first battery, the voltaic pile, in 1800. The very first circuits used a battery and electrodes immersed in a container of water.
- momentum, was actually introduced by the French scientist and philosopher Descartes before Newton.

Careers: applications engineer, data analyst, design engineer, electrician, electrical engineer

Misconceptions:

- confuse how to set up voltmeter and ammeter

EDI:

- Early awareness of electricity among ancient Egyptians aware of shocks from electric fish.
- Korean-American Dawon Kahng helped invent the metal-oxide-semiconductor field-effect transistor (MOSFET) which has become the most-widely manufactured device in history.

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

6-Jan	B	16
13-Jan	A	17
20-Jan	B	ST3
27-Jan	A	ST3
3-Feb	B	ST3
10-Feb	A	21

Overview/number of lessons:
National Grid (3 lessons) & Electromagnetic induction (3 lessons)

Lesson Sequence:
Lesson 1 – Revision on energy resources
Lesson 2 – Make up of national grid
Lesson 3 – Demand on the national grid
Lesson 4 – Recap motor effect and link to induction
Lesson 5 – Generators
Lesson 6 – Transformers

Exam preparation

Prior	Current	Next
Year 10 – electromagnetism	National grid Generators & transformers Motor effect	Year 12 – resistance, parallel resistance, internal resistance

GW – Describe advantages and disadvantages of the different energy resources used to generate electricity & Describe what the generator effect is

BI – Explain why demand on the National grid changes & Explain how a potential difference is induced in a wire

EW – Describe what the National grid is and why transformers are used & Explain how a generator and transformer works

Tier 2/3 Vocabulary

- Glossaries, quick quizzes, within exam questions, PowerPoints.

Key words:
Generator, transformer, potential difference, conservation, motor effect, induction

Links to root words (etymology):

- Current from the latin, *currere*, 'run' – defined as the flow of electric charge
- Voltage – commonly referred to as 'potential difference' – from the latin, potent/potential – being able/power
- Circuit, originates from latin, *'go round'*
- Amps/amperes – named after French scientists Andre André-Marie Ampère

Careers: researcher, environmental biotechnology, fuel cell engineer, instrumentation & controls engineer, chemical engineer

History:

- The invention of the battery -- which could produce a continuous flow of current -- made possible the development of the first electric circuits. Alessandro Volta invented the first battery, the voltaic pile, in 1800. The very first circuits used a battery and electrodes immersed in a container of water.

Recall of knowledge, application of knowledge, interpret information, analyse results, carry out practical procedures, write practical methods, write word & chemical equations **Assessment:** • Quick quiz • Exam style questions • Q&A • Interleaving				• momentum, was actually introduced by the French scientist and philosopher Descartes before Newton. **Careers**: applications engineer, data analyst, design engineer, electrician, electrical engineer **Misconceptions:** • understanding purpose of national grid – linked to energy **EDI:** • Scientists from different nationalities
Half-Term			6 weeks (?? lessons) (29 Days)	
25-Feb	B	22	INSET 24th Feb Exam preparation	• ***Equality Diversity and Inclusion (EDI) links?*** *Women's history month* *Ramadhan begins 1/3* *21/3 World Down Syndrome day* *31/3 Transgender day of visibility*
3-Mar	A	23		
10-Mar	B	24		
17-Mar	A	25		
24-Mar	B	26		
31-Mar	A	27		
Easter Holiday			5 weeks (?? lessons) (23 Days)	
22-Apr	B	28	Easter Monday 21st Early May bank hol 6/5 Exam Preparation	• ***Equality Diversity and Inclusion (EDI) links?*** *Good Friday 18/4* *Easter Sunday 20/4* *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*
28-Apr	A	29		
5-May	B	30		
12-May	A	ST2		
19-May	B	ST2		
Half-Term			7 weeks (?? lessons) (34 Days)	
2-Jun	A	33	SJBF INSET 4/7 Exam Preparation	• ***Equality Diversity and Inclusion (EDI) links?*** *LGBTQ+ pride month.* *Gypsy, Roma and Traveller history month.* *12/6 world day against child labour* *18/6 autistic pride day* *20/6 World refugee day*
9-Jun	B	34		
16-Jun	A	35		
23-Jun	B	36		
30-Jun	A	37		
7-Jul	B	38		
14-Jul	A	39		
(Total: 189 Days)				

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

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- 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)