



C1 - The Periodic Table

Number of weeks (between 6&8)	Content of the unit	Assumed prior learning (tested at the beginning of the unit)
6 weeks 24 lessons	<ul style="list-style-type: none"> • Atoms, elements and compounds • Structure of the atom • The Periodic table • Conservation of mass • Metals and non-metals 	<ul style="list-style-type: none"> • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
Assessment points and tasks	Written feedback points	Learning Outcomes (tested at the end and related to subject competences)
<ul style="list-style-type: none"> - Pre-unit test (baseline) - C1 GAT (formative) - 6 mark question (formative) - Scientific skills investigation (formative) - End of unit test (summative) 	<ul style="list-style-type: none"> - diagnostic marking on GAT - diagnostic marking on 6 mark question - diagnostic marking on skills investigation - feedback on progress after end of topic test <p>(*these opportunities in AfL column)</p>	<ul style="list-style-type: none"> I can recognise a simple atomic model I can state that mass is conserved during changes of state and chemical reactions I can list examples of atoms, elements and compounds I can label the subatomic particles of a simple atomic model I can represent elements using chemical symbols I can identify the relative masses and charges of subatomic particles I can describe the differences between atoms, elements and compounds I can draw accurate diagrams of nuclei of atoms of particular elements using the Periodic Table I can represent compounds using chemical formulae I can draw accurate diagrams of electron structure of atoms of particular elements using the Periodic Table I can explain why mass is conserved during changes of state and chemical reactions I can state that all elements currently known may be found listed in the Periodic Table I can state that the modern Periodic Table was developed by Mendeleev I can state that the Periodic Table can be used to predict patterns in reactions I can identify where metals and non-metals can be found on the Periodic Table I can state that the Periodic Table is arranged in periods and groups I can describe how elements with similar physical and chemical properties are grouped together I can list the properties of metals and non-metals I can state that elements in the same group of the Periodic Table will have similar patterns in reactions I can describe how the properties of metals and non-metals make them suitable for different uses I can describe the changes that Mendeleev made when he developed the modern Periodic Table I can state that metal and non-metal oxides react differently with water I can explain some of the properties of metals and non-metals with reference to their structure I can describe that metal oxides react with water to form an alkaline solution and non-metal oxides react with water to form acidic solution I can describe the patterns of reactivity for Group 1 and Group 7 in the Periodic Table I can explain how metals and non-metals react with water using word equations I can explain why Mendeleev made the changes he did when developing the modern Periodic Table I can explain how metals and non-metals react with water using symbol equations, recognising the chemical forms which result in the solution I can link group number and electron structure to explain the patterns of reactivity for Group 1 and Group 7 in the Periodic Table



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Lesson	Clear learning intentions (KQ)	Clear success criteria (Bands) (Keywords)	Hook (starter)	Presentation of content (teacher input)	Guided practice (pupil activities)	Requisition (per group)	Independent practice (homework)	Closure (AFL)
1. Pre unit test	How much do I know from KS2?	To complete exam	Word-search on keywords from KS2	Mind map of what pupils remember from KS2 as refreshers before exam	Pupils complete baseline test in silence		None	Pupil complete sentences: <i>One thing I know about this topic is...</i> <i>One thing I don't understand is...</i> <i>One question I have is...</i>
2. Atoms	What is everything I see made from?	I can recognise a simple atomic model (H) I can label the subatomic particles of a simple atomic model (G)	Mind storm everything they know about atoms – Q. What is everything made up of?	Video –Venus explains the atom. Cut and stick the atom – with its labels of sub atomic particles.	Use students to role play the atom. Mr Wrong - Students walk around the room and discuss why the atom around the room are incorrect. And suggest improvements.	Scissors, glue, atom print outs		Hunger games = Teacher reads out a statement and the students walk to the area of the room they feel the correct answer lays.
3. Sub-atomic particles	What is the structure of the atom?	I can state how many electrons and protons are in a given atom. (F) I can identify the relative masses and charges of subatomic particles (E) I can calculate the number of neutrons in a given atom (D)	Recall -Video Venus explains the atom Students write down information from the video	Role play – Students are given a laminated card with a ‘-,+ neutral, 1,1/2000 and 1’ on it. As a group they have to try and best model the Video they watched. Students then make a cartoon strip highlighting the ‘Gangs/groups’ within an atom. Students look at atomic number and understand what it represents and why all atoms are neutral.	Teacher shows their completed version of what a good template is Teacher assigns roles to less able students. Teacher demonstrates: how we use the atomic mass to calculate the number of protons and electrons. Extension how to calculate the number of neutrons.	Need laminated charge and masses. Print out a cartoon strip template and glue sticks.		Mini-whiteboards Teacher assessment of role play.
4. Elements	What is an element?	I can state the names of several elements (H) I can describe the difference between atoms and elements (F) I can identify the elements present in a compound (E)						



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5. Elements, Compounds and Mixtures	What is the difference between elements, compounds and mixtures?	<p>I can identify an element, mixture and compound (H).</p> <p>I can use model to represent elements, compound and mixtures (F)</p> <p>I can describe the differences between atoms, elements mixtures and compounds (E)</p> <p>I can explain how elements can become compounds through chemical processes (D)</p>	Write down as the names of as many elements that you can remember from last lesson.	<p>Video – ‘make me genius’ What elements mixtures and compounds.</p> <p>Students make a poster on elements, compounds and mixtures using information sheet and think of examples to highlight each concept. Molymods to help extend students or support others.</p>	Teacher uses molymods to show the difference between Compound and mixtures.	<p>Molymods. Class set.</p> <p>Mixtures- rice and peas and lentils.</p> <p>Compounds – Magnesium strips.</p> <p>Element- 3 plate with one type of metal.</p>		<p>Mini whiteboards</p> <p>Students given a series of particle diagrams one after another and have to write down if it's a element, compound or mixture.</p>
6. The Periodic table	What is the periodic table?	<p>I can identify where metals and non-metals can be found on the Periodic Table (H)</p> <p>I can represent elements using chemical symbols (F)</p> <p>I can draw electron configuration for the first 20 elements (D)</p> <p>I can analyse patterns in electron structure within the periodic table (C)</p>	Students take out their planners and try to draw the outline of the periodic table.	<p>Students take out their planners and try to draw the outline of the periodic table on to a poster paper.</p> <p>They try to spell their names using the elements. e.g. Mr Ibrar (Iodine, bromine, argon)</p> <p>Note- if their name is not possible they spell Southampton.</p> <p>Extension: Write the mass number and proton number for each element.</p>	<p>Demonstrate how to use the periodic table – where the metals, non-metals etc. are.</p> <p>Demonstrate how you would find your own name.</p> <p>Teacher goes through what groups and rows are.</p>	N/A		<p>Quiz 5 questions to do with the periodic table; e.g. where do you think the Alkali metals group is?</p> <p>ABC or D?</p>



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7. Mendeleev	How is the modern periodic table constructed?	<p>I can state that the modern Periodic Table was developed by Mendeleev (H)</p> <p>I can describe the changes that Mendeleev made when he developed the modern Periodic Table (E)</p> <p>I can explain why Mendeleev made the changes he did when developing the modern Periodic Table(C)</p>	Look at their periodic table and write down as many patterns as you can spot.	<p>Class read out a time line information sheet.</p> <p>Watch a video on the history of the periodic table and either makes notes or answer targeted questions on the video.</p> <p>Students make a cartoon strip timeline to show why changes were made from the previous periodic tables and why the modern table works well.</p>	<p>Teacher – guided reading</p> <p>Differentiated targeted questions for the video</p> <p>Teacher shows a funny cartoon strip on the history of the periodic table with a bit of banter to help inspire students to express themselves.</p>	<p>Highlighters.</p> <p>Printout of the cartoon strips.</p>		<p>Peer assessment using a success criteria- students present their cartoon strip and are given 5 positive things about their cartoon strip from the class and 1 thing that could make the strip better.</p> <p>What does Eka mean? Why did Mendeleev use the term Eka?</p>
8. Metals	What are the properties of metals?	<p>I can list the properties of metals (H)</p> <p>I can describe how the properties of metals make them suitable for different uses (F)</p> <p>I can explain conduction of heat and electricity in terms of metallic structure and free electrons (C)</p>	<p>Can you name 3 metals? What are they used for?</p> <p>Extension: Students write down why the material was not suitable.</p>	<p>Teacher explains clearly how the carousel will be orchestrated.</p> <p>Go through results</p>	<p>Students fill in an information sheet to do with properties while doing a carousel: Conduction of heat and electricity, malleable, sonorous, shiny</p> <p>Extension: Worksheet on free electrons and metallic properties</p>	<p>1. Battery, wires, c-clips, metal strips, bulb 2. Keetle, beaker, metal strips 3. Torch, metal strips 4. Tuning forks</p>		<p>Self-assessment</p> <p>Table assessment.</p>
9. Non-metals	What are the properties of non-metals?	<p>I can list the properties of non-metals (H)</p> <p>I can describe how the properties of non-metals make them suitable for different uses (F)</p> <p>I can link group number and electron structure to explain why metals in the same group have similar properties (C)</p>	<p>Can you name 3 non-metals? What are they used for?</p> <p>Extension: Students write down why the material was not suitable.</p>	<p>Teacher explains clearly how the carousel will be orchestrated.</p> <p>Go through results</p>	<p>Students fill in an information sheet to do with properties while doing a carousel: Conduction of heat and electricity, malleable, sonorous, shiny</p> <p>Extension: Worksheet on graphite</p>	<p>1. Battery, wires, c-clips, wood, glass, plastic rods, bulb 2. Keetle, beaker, wood, glass, plastic rods strips 3. Torch, wood, glass, plastic rods 4. Tuning forks</p>		<p>Self-assessment</p> <p>Table assessment</p>



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10. Rust	How do rusting/corrosion occur?	<p>I can predict when rusting will occur (G)</p> <p>I can describe the conditions under which rusting occurs (F)</p> <p>I can explain how galvanising prevents rust (E)</p> <p>I can analyse how more reactive metals can be used to prevent rust (D)</p>	<p>Students look at two nails, one new and one rusted.</p> <p>Brain storm ideas of how the nail became rusty.</p> <p>THINK, PAIR SHARE: Students are given data sheet with information about the dates of different layers of the Earth where Iron is found. Students give an explanation to why the older layers have pure Iron and why after the evolution of plants we find Iron is rusted?</p>	<p>Show examples of rusting that can occur in someone's house.</p> <p>Teacher explains what how each beaker should be opened without creating too many discrepancies in the practical.</p> <p>Teacher guides the class discussion on the Oxygen levels in the early atmosphere with the students</p>	<p>Guided reading</p> <p>Highlighting of text.</p> <p>Students conduct a practical which they will review in the next lesson.</p> <p>Students answer exam style questions.</p>	<p>Iron wool and pure oxygen beaker, air, and in a vacuum.</p> <p>OR</p> <p>http://www.msm.cam.ac.uk/SeeK/rustynails.htm</p>		Peer-assess exam question
11. Metal and Acid investigation	How can I plan an experiment to investigate how metals react with acids?	<p>I can identify some variables in an investigation (G).</p> <p>I can identify independent, dependant and control variable (F).</p> <p>I can plan & carry out appropriate types of scientific enquiries to test predictions(D)</p>	<p>Predict what will happen to these 3 metals when we put into acid.</p>	<p>Demo with 3 metals the reaction of metals with acids</p>	<p>Pupils design their own investigations question. Changing one variable e.g. type of metal or concentration of acid. Pupils to write a plan. Model the writing of a plan for an investigation, use writing frames, scaffolding</p>	<p>Hydrochloric acid 0.1M Magnesium ribbon, copper, Zinc. Other weaker concentrations of HCl</p>		Self asses and peer asses Plan of the investigation
12. Metal and Acid investigation	How can I carry out an investigation for metals reacting with acids?	<p>I can identify some hazards during scientific investigation(H)</p> <p>I can describe some safety precautions during scientific investigations (G)</p> <p>I can suggest improvements to the risk assessment(B)</p>	<p>Which metals would react with acids?</p>	<p>Demo using 3 metals reacting with hydrochloric acid. Introduce ideas about variables, control group and prediction</p>	<p>Peers assess their risk assessments. Trail the experiment doing preliminary record in results table</p>	<p>Hydrochloric acid 0.1M Magnesium ribbon, copper, zinc. Other weaker concentrations of HCl. Scissors</p>		How could we improve this method for the real experiment?



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13. Metal and Acid investigation	How can I carry out an investigation for metals reacting with acids?	<p>I can make and record simple observations and measurements in a table (H)</p> <p>I can explain the importance of some sampling techniques (C).</p> <p>I can suggest improvement to methods where reliability may be a concern (B)</p>	Which metals would react with acids?	<p>Demo using 3 metals reacting with hydrochloric acid.</p> <p>Introduce ideas about variables, control group and prediction</p>	<p>Actual experiment draw results table. Experiment Write a conclusion and evaluation.</p>	<p>Hydrochloric acid 0.1M Magnesium ribbon, copper, Zinc. Other weaker concentrations of HCl. Scissors</p>		<p>Peer-assess SPAG</p> <p>Diagnostic marking of investigation.</p>
14. Alkali Metals	How do Alkali metals react with water?	<p>I can state that elements in the same group of the Periodic Table will have similar patterns in reactions (G)</p> <p>I can describe the patterns of reactivity for Group 1 metals with water (E)</p> <p>I can explain why reactivity increases down group 1 using electron shells (B).</p>	<p>Students identify the location and write down the names of Alkali metals.</p> <p>Students look down a group and try write down anything they notice e.g. atomic numbers getting bigger</p>	<p>Students are given a table with two columns - one metals and the other labelled observation.</p> <p>Students observe the reaction of alkali metals and water demonstration done by the teacher and discuss as a class. What they noticed and write down their findings.</p> <p>Video- brainiac video with francium. ISA question</p>	<p>Students then write down a step by step methodology of how the experiment should be carried out.</p> <p>Teacher demonstrates to the students clearly what signs they should be looking out for before the demonstration is conducted.</p>	Alkali metals, protective gear.		<p>True and false</p> <p>Exit cards</p> <p>Mr wrong – a false statement is written and the students have to work with their partner to correct it.</p> <p>Describe why you should not mix alkali metals with water? Use examples to highlight your answer using key words, examples from the lesson</p>
15. Halogens	How does the reactivity of the Halogens vary?	<p>I can identify the elements in group 7 from the periodic table (H)</p> <p>I can describe the patterns of reactivity for group 7 in the periodic table (D)</p> <p>I can explain the properties of the group 7 elements in terms of atomic structure (B)</p>	2 minutes to find the elements belonging to the halogen group 7	<p>Video "The new periodic table" on you tube.</p> <p>Research symbols uses and properties of halogens.</p>	Pupils make up questions and answers for a quiz.	Halogen reactions with metals demo		Quiz on uses /properties about halogens.



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16. Noble Gases	What are noble gases and their properties?	<p>I can identify the elements in group 0 from the periodic table (H)</p> <p>I can describe the properties of the Halogen metals (D)</p> <p>I can explain the properties of the group 0 elements in terms of atomic structure (C)</p>	Name as many noble gases in 1 minute. Discuss write why they are grouped in order.	Data on melting and boiling point used to put in order of reactivity. Watch you tube "Noble gases and reactive elements (noble gases)	Role paly "I am a noble gas. Describe act out the physical and chemical properties.			Peer assessment on the content and skills of presentation of role play
17. 6 Mark Question	Can I write a detailed 6 mark question using key scientific terms?	<p>I can score 1-2 marks on the 6 mark question (G)</p> <p>I can score 3-4 marks on the 6 mark question (E)</p> <p>I can score 5-6 marks on the 6 mark question (C)</p>	What do 6 mark exam questions look like? How are they answered?	<p>Breakdown of the question. Looking at command words. Modelling the answer. Using mark scheme peer asses and evaluate</p> <p>Question: Describe and explain the patterns in reactivity of group 1 and group 7 elements.</p>	<p>Use example question with answer. Pupils to use mark scheme and mark the 6 mark question. Pupils highlight the aspects of writing which gained the marks.</p> <p>Answer the 6 mark questions. Self-assess and peer assess</p> <p>Pupils make their own 6 mark question with answers. Swap and trial out each other</p> <p>OR</p> <p>Choose the best ones for the whole class to attempt with time limits.</p>			<p>Peer assess and self-assess 6 mark questions.</p> <p>Brainstorm all the features needed for a 6 mark question.</p>
18. Transition metals	What are the transition metals and what properties do they have?	<p>I can state that elements in the same group of the periodic table will have similar patterns in reactions.(H)</p> <p>I can describe how elements with similar physical and chemical properties are grouped together.(E)</p>	Use a highlighter pen to highlight the transition metals on the periodic table.	Teacher reads out the symbols and pupils write the names of the corresponding metals.	<p>You tube" the transition metals song" pupils to write down as many metals with their properties.</p> <p>Experiment-Testing metals. Brainstorm properties physical and chemical. List and use keywords.</p>	<p>Electric circuit to test conductivity.</p> <p>Sandpaper to test shiny.</p> <p>Magnets to test magnetic properties.</p> <p>Demo transition metal compounds coloured compounds used in glazing pottery</p>		Test on keywords – tensile, malleable, conduction of heat and electricity, sonorous, ductile,



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19. Patterns	What patterns are there in the periodic table?	<p>I can state that the modern periodic table was developed by Mendeleev.(H)</p> <p>I can describe the changes that Mendeleev made when he developed the modern Periodic Table (D)</p> <p>I can explain why Mendeleev made the changes he did when developing the modern periodic table. (B)</p>	Word search “ The periodic table”	Video clip on Mendeleev discovery of metals and how he ordered the elements into groups according to reactivity.	<p>Activity- Read description’s of reactions and put in order of reactivity.</p> <p>Taboo cards. Metals and non-metals names and descriptions of elements. Pupils in pairs describe and guess the names of elements based on the descriptions.</p>			The periodic table literacy task- 6 mark question. Describe in detail the patterns in physical and chemical properties of group 1 elements.
20. Word Equations	How can we represent reactions using word equations?	<p>I can state that during chemical reactions reactants become products (G)</p> <p>I can represent chemical reactions using word equations (E)</p> <p>I can represent chemical reactions using symbol equations (C)</p>						
21. GAT	What do I need to include in my a badger assessment task	*see level ladder on GAT	Show burning of magnesium and discuss what is happening in terms of elements/compounds, metals/non-metals, discuss word equation	Show examples of badger assessments tasks completed by previous year 7. Use the level ladder to check understanding.	Teacher to model on whiteboard from the level ladder the content and skills needed for certain bullet points.			Pupils write a plan of what to include and how to start their badger assessment
22. GAT	How can I complete a badger assessment task?	*see level ladder on GAT	Use the example of badger assessment and read the feedback given by peers	Use plan to start writing the badger assessment. Differentiation writing frame needed of starting sentences.				Peer mark the writing so far using green pen. WWW and EBI.



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23. Revision	How can I revise for this topic on the periodic table?	I can state what are atoms, elements and compounds I understand what the properties are for the elements in the periodic table I can explain patterns of reactivity I can describe patterns of reactivity	Word search quick quiz hot seating on keywords for the topic.	Hot seating leads to a quick test on the meanings of keywords. Pupils given the task to write their own questions and answers on the topic				Swap questions for peer answering. Then peer mark using the answers created by the pupils.
24. End of Unit Test	How much have I learnt about the periodic table?	I can apply my knowledge from this unit in the test?	Purpose of test	Brainstorm all the keywords learnt from this topic as a warm up to the exam.	Pupils have a quick 5 minute reflection on revision for the topic.			