

# Science

## Year 7: Periodic table

Assessment Opportunities	Literacy/Reading opportunities	CEIAG Links
<ul style="list-style-type: none"> <li>Regular low stakes quizzing of AO1- self marked.</li> <li>In class past paper questions where – self / peer marked</li> <li>Extended writing is teacher marked with personalised feedback provided.</li> <li>End of unit assessment self &amp; teacher marked with collective feedback provided.</li> </ul>	<p><b>Reciprocal reading:</b> Naming the elements of the periodic table</p> <p><b>Key vocab is highlighted in the SOL</b></p>	<p><b>Spotlight on careers:</b> Cosmetic chemist</p> <p>Other careers:</p> <ul style="list-style-type: none"> <li>Materials scientist</li> <li>Chemical engineer</li> <li>Pharmacist</li> <li>Environmental scientist</li> </ul>

### Curriculum vision:

“Our aim is to deliver a curriculum that is inclusive, relevant and progressive for all learners.”

### KS3 Periodic Table:

Lesson sequence	Learning outcomes / Key knowledge (including NC KS3) <a href="#">Interleave / review</a>	Skills development	Spec / book reference
1. <b>TBAT:</b> Explain how elements are organised in the Periodic table	<ul style="list-style-type: none"> <li>• <b>The principles underpinning the Mendeleev Periodic Table:</b> <ul style="list-style-type: none"> <li>○ Ordered by atomic weight</li> <li>○ Left gaps for undiscovered elements</li> <li>○ Grouped elements with similar properties together</li> </ul> </li> <li>• The Modern Periodic Table:           <ul style="list-style-type: none"> <li>○ Ordered by atomic number</li> <li>○ Groups &amp; periods</li> <li>○ Central transition metals</li> </ul> </li> <li>• <b>The Periodic Table: periods and groups; metals and non-metals</b> <ul style="list-style-type: none"> <li>○ <a href="#">Review atomic structure in terms of nucleus containing protons &amp; neutrons, electrons orbit the nucleus in shells.</a></li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Design:</b> Order a number of elements using given properties.</li> <li>• <b>Compare:</b> Early to modern Periodic tables, consider their own order within the comparison.</li> </ul>	<p><b>Spec NC pos <a href="#">here</a> pg9</b></p> <p><b>Boost book 3 pg 72</b></p>
2. <b>TBAT:</b> Use the Periodic table to identify elements	<ul style="list-style-type: none"> <li>• <b>The varying physical and chemical properties of different elements</b></li> <li>• <b>The Periodic Table: periods and groups; metals and non-metals</b> <ul style="list-style-type: none"> <li>○ What group and period number tell us about atoms of that element</li> <li>○ Identify elements with similar chemical &amp; physical properties by looking in the same group or period</li> <li>○ Identify atomic number &amp; mass number &amp; relate to the number of subatomic particles.</li> <li>○ Identify elements and symbols</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Identify:</b> Locate elements when given information pertaining to name, atomic number, shells, outer electrons.</li> <li>• <b>Determine:</b> Elements whose atoms have the same number of shells or outer electrons.</li> </ul>	<p><b>Spec NC pos <a href="#">here</a> pg9</b></p> <p><b>Boost book 3 pg 72</b></p>
3. <b>TBAT:</b> Contrast the properties of metals and non-metals  X2 lessons if including practical element	<ul style="list-style-type: none"> <li>• <b>The Periodic Table: periods and groups; metals and non-metals</b></li> <li>• <b>The properties of metals and non-metals</b> <ul style="list-style-type: none"> <li>○ Metals on the right, non-metals on the left</li> <li>○ Central block of transition metals</li> <li>○ Show anomalies such as mercury &amp; graphite</li> </ul> </li> <li>• <b>The chemical properties of metal and non-metal oxides with respect to acidity.</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Contrast:</b> Properties of metals &amp; non-metals; show table structure for answers, distinguish from compare</li> </ul>	<p><b>Spec NC pos <a href="#">here</a> pg9</b></p>

	<ul style="list-style-type: none"> <li>○ Review meaning of melting point &amp; boiling point and identify states of matter on a number line.</li> <li>○ Check students' understanding of density.</li> </ul>	<ul style="list-style-type: none"> <li>● <b>Predict:</b> Investigate properties of metals &amp; non-metals, make predictions</li> <li>● <b>Estimate:</b> Melting and or boiling points of given elements</li> </ul>	<p><b>Boost book 3 pg 72</b></p>
<p>4. <b>TBAT:</b> Describe the properties of group 1 elements.</p>	<ul style="list-style-type: none"> <li>● <b>The varying physical and chemical properties of different elements</b></li> <li>● <b>The Periodic Table: periods and groups; metals and non-metals</b></li> <li>● <b>How patterns in reactions can be predicted with reference to the Periodic Table</b> <ul style="list-style-type: none"> <li>○ Group 1 are the alkali metals.</li> <li>○ Observe demo of group 1 metals including testing the pH of the water and for the H<sub>2</sub> produced.</li> <li>○ Complete table of observations</li> <li>○ Describe &amp; explain physical and chemical properties as descend the group</li> <li>○ Use of dataloggers to collect quantitative data and why this is preferable to qualitative observations.</li> </ul> </li> <li>○ Review test for hydrogen gas, review pH scale</li> </ul> <p><b>Skills task to complete</b></p>	<ul style="list-style-type: none"> <li>● <b>Name:</b> Group 1 = alkali metals</li> <li>● <b>Observe:</b> Reaction of group 1 metals</li> <li>● <b>Determine:</b> Products of the reactions</li> <li>● <b>Record:</b> Observations</li> <li>● <b>Suggest:</b> How quantitative data could be collected</li> <li>● <b>Describe:</b> How properties change as we descend the group</li> <li>● <b>Explain:</b> Why properties change as we descend the group</li> </ul>	<p><b>Spec NC pos <a href="#">here</a> pg9</b></p> <p><b>Boost book 3 pg 72</b></p>
<p>5. <b>TBAT:</b> Predict the properties of group 7 elements.</p>	<ul style="list-style-type: none"> <li>● <b>The varying physical and chemical properties of different elements</b></li> <li>● <b>The Periodic Table: periods and groups; metals and non-metals</b></li> <li>● <b>How patterns in reactions can be predicted with reference to the Periodic Table</b> <ul style="list-style-type: none"> <li>○ Group 7 are the halogens</li> <li>○ State that the reactivity of halogens decreases as you descend the group.</li> <li>○ Predict trends in melting &amp; boiling points as you descend the group</li> <li>○ Observe demo / video of displacement reactions involving iodine &amp; bromine; make justified predictions of the results with chlorine. <ul style="list-style-type: none"> <li>➢ <a href="#">YouTube video</a> Time 0.25 → 1.35 (rest of the video can be played &gt; predictions have been made)</li> </ul> </li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Name:</b> Group 7 = halogens</li> <li>● <b>State:</b> Trends in reactivity decrease as you descend the group</li> <li>● <b>Predict:</b> Trends in physical properties</li> <li>● <b>Observe:</b> Displacement reactions</li> <li>● <b>Predicts:</b> Reactions with chlorine water</li> <li>● <b>Justify:</b> Predictions made</li> </ul>	<p><b>Spec NC pos <a href="#">here</a> pg9</b></p> <p><b>Boost book 3 pg 72</b></p>

	<ul style="list-style-type: none"> <li>○ Review test for hydrogen gas, review pH scale</li> </ul>		
<p>6. <b>TBAT:</b> Plot the properties of group 0 elements</p>	<ul style="list-style-type: none"> <li>● <b>The varying physical and chemical properties of different elements</b></li> <li>● <b>The Periodic Table: periods and groups; metals and non-metals</b></li> <li>● <b>How patterns in reactions can be predicted with reference to the Periodic Table</b> <ul style="list-style-type: none"> <li>○ Group 0 are the noble gases</li> <li>○ Plot data on melting and boiling points on bar charts</li> <li>○ Predict missing values</li> <li>○ Uses of the different gases</li> <li>○ Reactivity increases as you descend the group</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● <b>Predict:</b> Trends in physical properties and missing values</li> <li>● <b>Plot:</b> Melting and boiling points onto bar charts.</li> <li>● <b>Discuss:</b> Suitability of different types of charts.</li> </ul>	<p><b>Spec NC pos</b> <a href="#">here</a> <b>pg9</b></p> <p><b>Boost book 3</b> <b>pg 72</b></p>
<p>7. <b>TBAT:</b> Describe and explain trends across the periodic table</p>	<ul style="list-style-type: none"> <li>● <b>The varying physical and chemical properties of different elements</b></li> <li>● <b>How patterns in reactions can be predicted with reference to the Periodic Table</b> <ul style="list-style-type: none"> <li>○ Describe effect of increasing shells on size of the atom and link to reactivity</li> <li>○ Describe how group number identifies the number of outer electrons and link to reactivity</li> <li>○ Describe trends in melting and boiling points and link to group and period number</li> </ul> </li> </ul> <p><b>Skills task to complete</b></p>	<ul style="list-style-type: none"> <li>● <b>Describe:</b> trends across groups and down periods</li> <li>● <b>Explain:</b> Link these to physical and chemical properties</li> </ul> <p><b>Writing: Explain trends</b></p>	<p><b>Spec NC pos</b> <a href="#">here</a> <b>pg9</b></p> <p><b>Boost book 3</b> <b>pg 72</b></p>
<p>8. <b>TBAT:</b> Engage with a scientific article</p> <p>(this lesson can be delivered anywhere in the sequence)</p>	<ul style="list-style-type: none"> <li>● Identify new vocabulary, discuss meaning and annotate article.</li> <li>● Identify and highlight element names.</li> <li>● Answer questions based on the article.</li> <li>● Use the rules outlined by the article to design a name for a newly discovered element.</li> <li>● Justify choice of name.</li> </ul>	<p><b>Reciprocal reading: Naming the elements of the periodic table</b></p> <ul style="list-style-type: none"> <li>● <b>Identify:</b> Useful information in the article.</li> <li>● <b>Annotate:</b> Make relevant notes around the text.</li> <li>● <b>Use:</b> Follow guidelines to name a new element.</li> <li>● <b>Justify:</b> Give reasons for their choice of name</li> </ul>	

Vocab	Links to previous learning / interleaving	Assessment & homework																																												
<table border="0"> <tr> <td><b>L3 Vocab</b></td> <td>Melting point</td> <td><b>L2 Vocab</b></td> <td><b>Command words focus</b></td> </tr> <tr> <td>Group</td> <td>Boiling point</td> <td>Column</td> <td>Design</td> </tr> <tr> <td>Period</td> <td>Datalogger</td> <td>Row</td> <td>Predict</td> </tr> <tr> <td>Element</td> <td>Reactivity</td> <td>Descend</td> <td>Identify</td> </tr> <tr> <td>Atom</td> <td>pH</td> <td>Ascend</td> <td>Estimate</td> </tr> <tr> <td>Symbol</td> <td>Observation</td> <td>Trend</td> <td>Observe</td> </tr> <tr> <td>Atomic number</td> <td>Electron</td> <td>Qualitative</td> <td>Justify</td> </tr> <tr> <td>Atomic mass</td> <td>Proton</td> <td>Quantitative</td> <td></td> </tr> <tr> <td>Alkali metal</td> <td>Neutron</td> <td>Guideline</td> <td></td> </tr> <tr> <td>Halogen</td> <td>Atomic nucleus</td> <td>Annotate</td> <td></td> </tr> <tr> <td>Noble gas</td> <td>Shells</td> <td></td> <td></td> </tr> </table>	<b>L3 Vocab</b>	Melting point	<b>L2 Vocab</b>	<b>Command words focus</b>	Group	Boiling point	Column	Design	Period	Datalogger	Row	Predict	Element	Reactivity	Descend	Identify	Atom	pH	Ascend	Estimate	Symbol	Observation	Trend	Observe	Atomic number	Electron	Qualitative	Justify	Atomic mass	Proton	Quantitative		Alkali metal	Neutron	Guideline		Halogen	Atomic nucleus	Annotate		Noble gas	Shells			<p><b>KS3 particle model, elements &amp; compounds, acids &amp; alkalis,</b></p> <ul style="list-style-type: none"> <li>○ Atomic structure in terms of sub-atomic particles</li> <li>○ pH</li> <li>○ Elements are made of a single type of atom</li> </ul> <p><b>KS2</b></p> <ul style="list-style-type: none"> <li>○ Metals as materials</li> <li>○ Certain named elements such as oxygen</li> <li>○ Melting and boiling</li> </ul>	<ul style="list-style-type: none"> <li>• Regular low stakes quizzing of AO1</li> <li>• In class assessment of AO1, AO2, AO3 using past paper questions</li> </ul> <p>Homework is set every week and may include online submission, past paper questions and revision for in class assessments.</p>
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<p><b>Independent learning</b></p> <p>BBC bitesize KS3: <a href="https://www.bbc.co.uk/bitesize/topics/zv9nhcw">https://www.bbc.co.uk/bitesize/topics/zv9nhcw</a></p> <p>TED-Ex video about Mendeleev <a href="https://www.youtube.com/watch?v=fPnwBITSmgU">https://www.youtube.com/watch?v=fPnwBITSmgU</a></p> <p>Fuse school video on the periodic table <a href="https://www.youtube.com/watch?v=7mLPC74GHMo">https://www.youtube.com/watch?v=7mLPC74GHMo</a></p> <p>Quizzes:  <a href="https://www.educationquizzes.com/ks3/science/atoms-and-elements-01/">https://www.educationquizzes.com/ks3/science/atoms-and-elements-01/</a>  <a href="https://www.footprints-science.co.uk/index.php?quiz=Periodic_table">https://www.footprints-science.co.uk/index.php?quiz=Periodic_table</a></p>		<p><b>Misconceptions / common errors</b></p> <ul style="list-style-type: none"> <li>• Elements in the Same Group Have Identical Properties</li> <li>• The Periodic Table has / will never change</li> <li>• All Elements Are Stable</li> <li>• Metals, Nonmetals, and Metalloids are Always Clearly Separated</li> </ul>																																												