Year 7 Chemistry – Objectives and Assessment

Lesson	Range and Content Objective	Skills Objective	Activities	Formal Assessment	Success Criteria
1.	• To know the suggested arrangement and movement of particles in solids, liquids and gases.	• Identify the use of evidence in the development of scientific ideas. • To use abstract models to explain scientific ideas.	• This will probably take 2 lessons depending on previous learning. • Consider the properties of SLG, focus on shape, volume, ability to flow, density. • Challenge pupils to explain why these are the properties. Link to particle THEORY and link to previous learning about what a theory is. • Recall particle theory (or re teach from KS2) use Hodder A 'carnival people' as a model of particle. Children annotate diagrams to explain how the models are 'like' particles in S/L/G • Supporting worksheets	Correct explanation of annotated diagrams.	• Must identify S/L/G from a diagram of particles and describe the movement of these particles. • Challenge: apply particle theory to explain the properties of S/L/G
2.	• To apply particle theory.	• To use abstract models to explain scientific ideas.	• Watch or carry out diffusion of food colouring in water. Groups draw and explain what they think is	Correct explanation in books	• Must explain diffusion in terms of particles in words and diagrams • Challenge: explain one

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			happening, referring to particles. • Write up final answer and discuss. • Extensions: Hot water, gases (body spray in a room), why not in solids? (all referring to particle theory) • Supporting worksheets and animations		of the extension tasks in terms of particles.
3.	• To apply particle theory.	• To use abstract models to explain scientific ideas.	• Demo expansion of a ball and ring (in 'particle theory box) • Groups explain using particle theory • Record final answer • Extension: Balloon over flask and warm, children explain.	Correct explanation in books	• Must explain expansion in terms of particles in words and diagrams • Challenge: explain one of the extension tasks in terms of particles.
4.	• To apply particle theory.	• To use abstract models to explain scientific ideas.	• Compression of S/L/G in syringes, groups explain using particle theory. • Record final answer • Extension, consideration of gas pressure inside a	Correct explanation in books	• Must explain compression in terms of particles in words and diagrams • Challenge: explain one of the extension tasks

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			balloon.		in terms of particles.
5.	To apply particle theory.	• Investigative approaches	• Fizzy drinks going flat investigation (see exploring science 7G • Plan, predict, carry out and conclude.	Investigation planning sheet marking.	•
6.	Changes of state	• Investigative approaches	• Vocabulary of changes of state (melting, evaporation, condensation, freezing, sublimation) • Heating curves / cooling curves – linked to particle theory and bonds between particles)		•
7.	To know how to handle acids safely	• Investigative approaches - controlling risk	• Hazard symbols, what do they mean? Suggestions cut/draw and label in books. • Demo acids dissolving Mg and evolution of heat to display corrosive properties of acids • Read hazard for HCl • Write risk assessment for HCl (can take 2 lessons)	Risk assessment in assessment books.	• Safety level descriptors.
8.	To be able to handle acids safely.	• Draw conclusions that utilise more than one piece of evidence.	• Exp sci investigation: 'Which is the most hazardous acid?' (3 acids, labelled x, y and z I'd use HCl 1M, HCl 0.1M	Explanation of choice for most hazardous acid.	• Must: identify the most hazardous acid. • Challenge: give several pieces of evidence for

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			and acetic acid 1M, react each with marble chips and Mg as in exploring science)`	Assessment of handling acids correctly.	your choice.
9.	To understand the term 'indicator' To be able to identify and classify acids substances.		• Explanation of litmus as an indicator. (define term 'indicator' first, demo litmus in HCl and water and NaOH) • Test household substances with litmus and sort into acids/alkalis. • Spider diagrams of findings. • Definitions of acids and alkalis.	Correct definitions of acid and alkali.	• Must: use litmus to correctly identify a substance as an acid/alkali • Challenge: state what all the acids have in common and what all the alkalis have in common.
10.	To understand the term 'indicator'		• Make red cabbage and beetroot indicator (and possibly others?) (you don't need to boil the cabbage, just grind a small amount in a little warm water with a pestle and mortar) • Test with acid and alkali. • STEM club stains.	Indicators made successfully.	• Must make an indicator and use it to identify acids and alkalis. • Challenge: suggest other substances that could be used as indicators and test them.
11.	To know how to test the strength of an acid or alkali and give its pH	• Use scientific conventions and ideas.	• Discuss limitations of litmus as an indicator (doesn't tell us the strength) • Intro universal indicator	pH is given and listed as strong/weak acid/alkali	• Must sort substances as strong/weak acids/alkalis • Challenge: give the pH

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			and the pH scale to determine acid strength. • Test pH of household substances (I'd use paper for the this rather than liquid) • Supporting tasks.	Colour of UI is recognised as a specific pH	of the substance from the colour of the indicator.
12.	To know what happens when an acid and alkali are mixed together.		• Demo neutralisation (use 25ml 0.1M HCl and 25ml 0.1M NaOH. Add the NaOH to the acid, drop wise with a small amount of UI in the mixture. Swirl. Stop when mixture reaches pH 7) • Groups carry out neutralisation • Write equation for neutralisation.	A neutral substance is produced. Equation is attempted.	• Must produce a neutral solution. • Challenge: write an equation for the reaction of neutralisation, give the products.
13.	To know everyday uses of neutralisation.	• To understand everyday applications of scientific ideas.	• Discuss uses of neutralisation. • Intro idea of acid indigestion.	Explanation of how antacids work is written correctly.	• Must: give the pH of antacids and use this to explain how antacids work.

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			• Test antacids with UI and groups explain how they work. • Discuss other examples of neutralisation in action.		• Challenge: research other example of everyday neutralisation.
14.	To know everyday uses of neutralisation.	• Investigative approaches.	• Investigation, which is the best antacid? The assessment is the planning, however they can carry out the investigation and conclude it, taking 2 lessons. If they carry it out, you can use 3 carbonates as the antacids, and I'd use 1M HCl as the stomach acid, in small quantities. There is also an exploring science activity called 'best plan' that fits in here	Planning investigation levelled in assessment books.	• AF4 level descriptors.
15.	To understand the reaction acids and carbonates.	To identify patterns in findings To draw conclusions from	• Consider the gas evolved in the antacid investigation, what gas could it be? • Demo limewater test for	Gas identified as carbon dioxide. Correct equation	• Must: Name the gas that is made when acids and carbonates react, and describe

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		evidence	CO_2 (blow into limewater through a straw) • Groups test various carbonates (sodium, copper, potassium, calcium) with acid (1M HCL) and sum up findings. (email or ring me if you need support on how to set this up) • Write equation for reaction of acids with carbonates.	given	how to test for that gas. • Challenge; write an equation for the reactions.
16.	To understand the reaction between metals and acids.	To draw conclusions from evidence	• Demo Mg in acid. Test to see if its carbon dioxide. • Speculate on what other gas it could be (look at equation) • Research tests for gases including H_2 and O_2. Allow groups to test and discover what the gas is. (Mg in 1M HCl) (you can use Zn, but it will only work with a much stronger acid, which you could demo) • Write equation for metals and acids.	Gas identified as Hydrogen Equations correctly written	• Must: Name the gas that is made when acids and metals react, and describe how to test for that gas. • Challenge; write an equation for the reactions.
17.	Reactivity Series investigation		• Reactions with water • Reactions with acid • Lithium, sodium, potassium, calcium, magnesium, iron,		• To produce a reactivity series.

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			zinc, copper		
18.	Fire triangle and fire safety		• Beaker and candle experiment		•
19.	Combustion /Oxidation (reactions with oxygen)		• Burning Copper investigation (mass) • Burning metals (flame tests, fireworks, powdered metals), fuels and equation writing		• Investigation write-up