

KEY STAGE 3 PROGRESS LADDER

SUBJECT: Chemistry - Year 7



STM STAGE

States of Matter

Chemical Reactions

Everyday Chemicals

1

Classify materials as solid, liquid or gas (simple)

Identify signs of a chemical reaction
Identify simple changes as chemical or physical
Identify reactants and products
Recognise that there are different types of chemical reaction

Describe a neutral solution as having pH 7 and/or turning universal indicator green
Give the name of an acid, base and indicator
Describe a neutral solution as having pH 7 and/or turning universal indicator green

2

Describe reactions qualitatively
Identify chemical and physical changes
Identify reactants and products in a reaction
Write word equations given the reactants and products
Identify addition and decomposition reactions from diagrams or word equations

Identify reactants and products in a reaction
Write word equations given the reactants and products
Describe reactions qualitatively but not always accurately
Describe acids, bases and/or indicators in simple terms
Describe how an indicator is used in simple terms
E.g. acids taste sour, indicators change colour
Describe neutralisation as the reaction between an acid and a base/alkali in simple terms **E.g. acid and base are opposites and cancel each other out**

3

Draw the arrangement of particles in a solid, liquid and gas
Describe the arrangement and movement of particles
Use specific terms to describe changes of state e.g. solid → liquid is melting
Recognise where a substance is changing state from a heating or cooling curve
Identify a mp or bp from a graph

Describe reactions qualitatively using appropriate terms
Compare chemical and physical changes
Write word equations when reactants or products are given
Interpret written information about reactions to classify them as addition, decomposition or rearrangement
Describe similarities and differences between types of reactions

Write word equations for reactions - reactants / products
Describe reactions qualitatively using appropriate terms
Describe acids, bases and indicators using more scientific language
Describe how an indicator is used in more scientific language
E.g. acids turn universal indicator red, acids have a pH of less than 7
Describe neutralisation as the reaction between an acid and a base/alkali using more scientific language
Use pH changes to explain neutralisation

4

Compare and contrast the arrangements and movement of particles in a solid, liquid and gas
Explain what happens to the particles during melting in simple terms
Label a heating or cooling curve
Use a melting point to determine if a substance is pure

Explain the role of energy in chemical reactions and/or physical changes
Explain qualitative observations e.g. why bubbles are given off
Draw accurate diagrams to represent addition, decomposition or rearrangement reactions using the particle model
Represent elements and compounds using formulae
Interpret written information to write word and symbol equations for reactions (formulae given)

Write symbol equations for reactions given formulae
Explain qualitative observations e.g. why bubbles are given off
Describe acids and/or bases using accurate and detailed scientific terms
Describe neutralisation as the reaction between an acid and a base/alkali using accurate scientific language
Describe accurately the pH changes during neutralisation
E.g. hydrogen ions and hydroxide ions react together to form water (or as an equation)

Suggested scaffolding

A

B: Group or partner discussion
Modelling examples e.g. equations
Annotating examples
Odd one out activities
Sentence starters

C: Cloze activities
Group discussion
True or false
Matching exercises
Using cards to form equations
Partner working - trial ideas on mini wb first

KEY STAGE 3 PROGRESS LADDER

SUBJECT: Chemistry - Year 8



STM STAGE

Separating Techniques

Elements and Compounds

Acids and Alkalis

2

Recognise particle diagrams of solids, liquids and gases
Describe trend in solubility based on temperature
Suggest a reasonable way to separate at least 2 components of a complex mixture
Identify different separation techniques given information in written or diagram form
Identify number of substances in a mixture from chromatograms

Identify an atom or molecule from its symbol or formula
Identify reactants and products in a reaction
Translates word equations from simple sentences e.g. copper reacts with oxygen to form copper oxide
Use the periodic table to find information about an element

Identify reactants and products in a reaction
Translates word equations from simple sentences
Identify a neutralisation reaction

3

Draw simple particle diagrams to show changes of state or dissolving
Describe a trend using data to support it for solubility and temperature
Produce a simple flow chart that will separate 2 components
Draw simple particle diagrams to show melting or dissolving or a simple mixture e.g. sand and iron
Choose some separating techniques correctly
Identify unknowns in chromatograms

Distinguish between elements and compounds
Recognize diagrams of elements, compounds and mixtures
Write word equations when reactants or products are given
Classify reaction type
Describe why the modern periodic table is useful and what information we get from it

Work out acid given the name of a salt and base
Write word equation when reactants or products given
Draw diagrams to represent the reaction between an acid and a base

4

Compare melting and dissolving in simple terms
Describe trends using quantitative data to support and explain trend of solubility and temperature
Explain how filtering and/or evaporation works to separate mixtures
Produce a flow chart that will identify the majority of components
Draw accurate particle diagrams to represent filtering or evaporation
Calculate Rf values on chromatograms

Represent elements and compounds using formulae
Draw and recognise accurate particle diagrams of elements and compounds
Write word equations for reactions
Write symbol equation when given the formulae
Describe differences between early periodic table and our modern version

Write word equations for salt formation given reactants or products
Write symbol equation and draw accurate particle diagrams when given the formulae
Describe how water forms in neutralisation

5

Produce an efficient flow chart that will identify the majority of components
Draw more complex particle diagrams e.g. a mixture of >2 components or distillation
Explain how distillation works to separate mixtures
Compare melting and dissolving in more complex terms e.g. energy or bonds
Explain trends in quantitative data / graphs with scientific knowledge and understanding of solubility and temperature
Explain how chromatography works to separate mixtures
Use Rf values to explain how we can identify unknown substances

Deduce formula of elements and compounds from particle diagrams
Draw accurate particle diagrams for mixtures
Write and balance symbol equations (formulae not given)
Explain how the periodic table has developed over time

Write and balance symbol equations and draw accurate particle diagrams (formula not given)
Explain why water forms in neutralisation (particle diagrams / ionic equation)

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KEY STAGE 3 PROGRESS LADDER

SUBJECT: Chemistry - Year 9



STM STAGE

Rates of Reaction

Reactions of metals

Particle Model

3

Describe how rate of reaction is affected by factors

Explain simply how rate of reaction is affected by concentration (e.g. particles more crowded)
Calculate RFM for simple binary compounds or common molecules e.g. CO₂, H₂O

Write word equations when reactants or products are given

Identify the position of protons, neutrons and electrons in an atom

State mass and charge of subatomic particles

Draw the arrangement of particles in a solid, liquid and gas

Describe the arrangement and movement of particles

Use specific terms to describe changes of state e.g. solid → liquid is melting

Recognise where a substance is changing state from a heating or cooling curve

Identify a mp or bp from a graph

Recognise that a smell spreads out across a room

4

Explain the difference between low and high concentration and/or large surface area / small surface area using diagrams to help

Calculate RFM

Use experimental data to show that mass is conserved in a reaction

Describe how rate of reaction is affected by factors

Explain how factors affect rate of reaction in simple terms

Represent elements and compounds using formulae

Write word equations for reactions

Write symbol equations when given the formulae

Outline key information about previous atomic models

Describe the Bohr model of the atom (using diagrams to help)

Compare and contrast the arrangements and movement of particles in a solid, liquid and gas

Explain what happens to the particles during melting in simple terms

Label a heating or cooling curve

Use a melting point to determine if a substance is pure

Explain diffusion in gases

Describe how gases cause pressure

Describe expansion and contraction of solids and liquids

5

Explain the difference between concentration and surface area using accurate particle diagrams to help

Use RFM to show that mass is conserved in reaction

Can explain the difference between successful collision and frequent collision

Use scientific language to explain accurately how factors affect rate of reaction

Explain what activation energy is and how it is affected by temperature change and catalysts

Draw the electronic configuration of an atom given its atomic number

Write symbol equations for reactions of metals

Use the reactivity series to predict what will happen in a reaction and explain their reasoning

Draw accurate particle diagrams to represent reactions

Describe and explain why the atomic model has changed over time, including experimental evidence

Explain what happens to the particles as a solid melts linked to attractive forces and the plateau(s) on a heating or cooling curve

Explain why melting point can be used to determine if a substance is pure

Explain diffusion in liquids and gases

Use the particle model to explain gas pressure and expansion / contraction of solids and liquids

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