

# Year 10: Chemical World- Chemical Reactions

## Context:

Every day, chemical reactions are taking place inside and around you. Chemical reactions digest food and release energy to your cells. They occur when you are cooking at the stove. They occur in factories when something is being manufactured. Some chemical reactions have lasting impressions such as in fireworks or bushfires. By understanding how these chemical reactions work, scientists are able to predict the outcome of the reactions and identify the products formed. It also allows scientists to control how fast or how slow a reaction takes place. This knowledge makes industrial processes more efficient, conserves the environment and can even save your life in a medical emergency.

## Working scientifically outcomes

- **SC4-4WS** – Questioning and predicting
- **SC4-5WS** – Planning investigations
- **SC4-6WS** – Conducting investigations
- **SC4-7WS** – Processing and analysing data and information
- **SC4-8WS** Problem solving
- **SC4-9WS** – Communicating

## Knowledge outcomes:

- **SC5-16CW: explains how models, theories and laws about matter have been refined as new scientific evidence becomes available**
- **SC5-17CW: discusses the importance of chemical reactions in the production of a range of substances, and the influence of society on the development of new materials**

## Applications:

- Scientific understanding, including models and theories, are contestable and are refined over time through a process of review by the scientific community
- The values and needs of contemporary society can influence the focus of scientific research

**Science Content:**

**CW3 Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed. (ACSSU178)**

- a. recall that all matter is composed of atoms and has mass
- b. identify a range of compounds using their common names and chemical formulas
- f. construct word equations from observations and written descriptions of a range of chemical reactions 🎓
- g. deduce that new substances are formed during chemical reactions by rearranging atoms rather than creating or destroying them
- c. classify compounds into groups based on common chemical characteristics
- d. investigate a range of types of important chemical reactions that occur in non-living systems and involve energy transfer, including:
  - combustion (ACSSU179)
  - the reaction of acids including metals and carbonates (ACSSU179)
  - corrosion
  - precipitation
  - neutralisation
  - decomposition
- e. identify some examples of important chemical reactions that occur in living systems and involve energy transfer, including respiration and reactions involving acids such as occur during digestion (ACSSU179)
- g. deduce that new substances are formed during chemical reactions by rearranging atoms rather than creating or destroying them

## Vocabulary:

Element      Compound              Metal              Non metal              Chemical reaction              Chemical equation      Reactant Product Exothermic  
Endothermic              Acid      Base              Neutralisation              Precipitation Combustion      Corrosion              Decomposition              Catalyst

## DIFFERENTIATION

For each outcome use A.L.A.R.M (I.D.E.A scaffold)

- **Support** – Provide greater assistance at lower order verbs and work towards consolidate
- **Consolidate** – stop at referenced verb
- **Extend** go beyond referenced verb

**Identify:** Name and Define

**Describe:** Differentiate and distinguish by providing **characteristics, features and properties**

**Explain:** **Cause and effect** = **LINK** purpose or function of **EACH** feature or characteristic listed above (Use linking words such as: As a result., This leads to .., This provides .., As a consequence., Therefore., Thus ..)

**Analyse/Evaluate:** **Positive and negative arguments** and finish with clear personal **point of view**

**Access differentiation content from server as appropriate to topic and class.**

**Includes work at Support, Consolidate and Extend level**

- Faculty Drive
  - Teacher
    - Science Faculty
      - Stage 4 or 5 (choose relevant one)
        - Resources
          - OXFORD – DIFFERENTIATION MATERIAL (choose relevant worksheets)

**Literacy:**

## 1. Access literacy works activities from server as appropriate to topic

- Faculty Drive
  - Teacher
    - Science Faculty
      - Stage 4 or 5 (choose relevant one)
        - Resources
          - Literacy works 1 and 2- (choose relevant worksheets)

## 2. Literacy and A.L.A.R.M; Remember I.D.E.A and stop at the verb provided:

- Literacy Set 1: COSMOS Articles
- Literacy Set 2: Mixed Activities

### First hand investigation(s):

Dependent, Independent and Control variables (validity) and reliability (repetition).

### Numeracy:

Numeracy and Skills Set

### ICT:

Use computers to set up Edmodo account.




Use ICT to access above COSMOS article online and submit answers from literacy exercise via Edmodo.

Graphs using excel/spread sheet

### KEY:

**General capabilities-**  = Literacy,  = Numeracy,  = ICT capability,  = Critical and creative thinking,  = Personal and Social capability,  = Ethical understanding,  = Intercultural understanding

**Cross-curriculum-**  = Aboriginal and Torres Strait Islander histories and cultures,  = Asia and Australia's engagement with Asia,  = Sustainability

**Other learning across the curriculum areas-**  = Civics and citizenship,  = Difference and diversity,  = Work and enterprise

## Year 10: Chemical World- Chemical Reactions

Content	Syllabus links	Suggested indicators of learning and understanding	Suggested teaching and learning activities	References and resources
<b>ASSUMED KNOWLEDGE STAGE 4 OUTCOMES</b>	<p><b>SC4-16CW</b> describes the observed properties and behaviour of matter, using scientific models and theories about the motion and arrangement of particles</p> <p><b>SC4-17CW</b> explains how scientific understanding of, and discoveries about the properties of elements, compounds and mixtures relate to their uses in everyday life</p>			<p><b>Oxford Text:</b> Chapter 2</p> <p><b>Oxford Workbook:</b> Chapter 2</p> <p><b>KISS Booklet:</b> Periodic Table, Atomic Structure</p> <p><b>Science Focus:</b> 3</p>
<b><i>CW3 Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed. (ACSSU178)</i></b>				
<b>3.1 CHANGING MATTER WITH CHEMICAL REACTIONS</b>	<b><i>5CW3a. recall that all matter is composed of atoms and has mass</i></b>	<p><b>Define</b> the terms matter, atom, element and mass</p> <p><b>Identify</b> that all matter is made up of atoms that have mass</p> <p><b>Identify</b> that atoms of different elements have different structures</p>		
	<b><i>5CW3b. identify a range of compounds using their common names and chemical formulae</i></b>	<p><b>Define</b> the terms compound, ionic and covalent</p> <p><b>Distinguish</b> between ionic and covalent compounds</p>	<b>Research task:</b> Students to research and find an online interactive periodic table	

		<b>Identify</b> a range of compounds using their common names and chemical formulae		
<b>LITERACY SET 1: COSMOS ARTICLE</b>				
	<i>5CW3f. construct word equations from observations and written descriptions of a range of chemical reactions</i>	<p><b>Define</b> the terms physical and chemical change</p> <p><b>Identify</b> signs of a chemical reaction e.g. colour change, temperature change, gas given off</p> <p>Construct word equations based on simple chemical reactions</p>	<p><b>CODE: 10CW1 First-hand investigation: Magnesium + oxygen</b></p> <p><b>CODE: 10CW2 First-hand investigation: Magnesium + HCl</b></p>	
<b>LITERACY SET 2: MIXED ACTIVITIES</b>				
	<i>5CW3g. deduce that new substances are formed during chemical reactions by rearranging atoms rather than creating or destroying them</i>	<p><b>Define</b> the terms reactants, products, conservation and mass and mechanical</p> <p><b>Describe</b> the law of conservation of mass</p>	<p><b>CODE: 10CW3 First-hand investigation: Law of Conservation of mass (Oxford pg112)</b></p> <p><b>Extension:</b> Balance simple chemical equations</p> <p><b>Assessment: Oxford online test-</b> Changing matter with chemical reactions. Students to achieve 100% in Support and Consolidate <b>OR</b> Consolidate and Extend</p>	
<b>NUMERACY AND SKILLS SET</b>				
<b>3.2 CLASSIFYING CHEMICAL REACTIONS</b>	<i>5CW3c. classify compounds into groups based on common chemical characteristics</i>	<p><b>Define</b> the terms acids, bases, salts, pH and indicator</p> <p><b>Identify</b> the key chemical properties of acids, bases and salts</p> <p><b>Identify</b> two examples of an acid, base and salt</p> <p><b>Identify</b> indicator colours and pH values associated with acids and bases</p>	<p><b>CODE: 10CW4 First-hand investigation: Testing pH</b></p> <p><b>CODE: 10CW5 First-hand investigation: Making a pH indicator (Oxford pg120)</b></p>	

	<p><i>5CW3d. investigate a range of types of important chemical reactions that occur in non-living systems and involve energy transfer, including: combustion (ACSSU179), the reaction of acids including metals and carbonates (ACSSU179), corrosion, precipitation and neutralisation</i></p>	<p><b>Define</b> the term <b><u>neutralisation</u></b></p> <p><b>Identify</b> the general word equation, and provide an example of a <b><u>neutralisation</u></b> reaction</p> <p><b>Identify</b> the general word equation, and provide an example of an '<b><u>acid on metals</u></b>' reaction</p> <p><b>Identify</b> the general word equation, and provide an example of an '<b><u>acid on carbonates</u></b>' reaction</p> <p><b>Define</b> the term <b><u>corrosion</u></b></p> <p><b>Identify</b> the general word equation, and provide an example of a <b><u>corrosion</u></b> reaction</p> <p><b>Define</b> the terms <b><u>displacement</u></b> and <b><u>precipitation</u></b></p> <p><b>Identify</b> the general word equation, and provide an example of a <b><u>displacement &amp; precipitation</u></b> reaction</p> <p><b>Define</b> the term <b><u>decomposition</u></b></p> <p><b>Identify</b> the general word equation, and provide an example of a <b><u>decomposition</u></b> reaction</p>	<p><b>CODE: 10CW6 First-hand investigation: Neutralisation</b> (Oxford pg122)</p> <p><b>CODE: 10CW7 First-hand investigation: Acid on metals</b> (Oxford pg123)</p> <p><b>CODE: 10CW8 First-hand investigation: Acid on carbonates</b></p> <p><b>CODE: 10CW9 First-hand investigation: Corrosion</b> (Oxford pg126)</p> <p><b>CODE: 10CW10 First-hand investigation: Displacement &amp; Precipitation</b> (Oxford pg130)</p> <p><b>CODE: 10CW11 First-hand investigation: Decomposition</b> (Oxford pg131)</p> <p><b>CODE: 10CW12 First-hand investigation: Modelling.</b> Using a molymod kit for the above reactions</p> <p><b>Assessment: Oxford online test-</b> Classifying chemical reactions. Students to achieve 100% in Support and Consolidate <b>OR</b> Consolidate and Extend</p>	
<b>NUMERACY AND SKILLS SET</b>				
<p><b>3.3 CHEMICAL REACTIONS IN LIFE</b></p>	<p><i>5CW3e. identify some examples of important chemical reactions that occur in living systems</i></p>	<p><b>Define</b> the terms energy, respiration, photosynthesis and digestion</p> <p><b>Identify</b> how acids and bases aid in digestion</p>	<p><b>CODE: 10CW13 First-hand investigation: Testing for carbon dioxide produced during respiration</b> (Oxford pg137)</p>	

	<i>and involve energy transfer, including respiration and reactions involving acids such as occur during digestion (ACSSU179)</i>	<p><b>Identify</b> chemical reactions involved in aerobic and anaerobic respiration and photosynthesis</p> <p><b>Compare and contrast</b> the reactions of respiration and photosynthesis</p> <p><b>Identify</b> whether energy is released or required by respiration and photosynthesis</p>	<p><b>Assessment: Oxford online test-</b> Chemical reactions in life. Students to achieve 100% in Support and Consolidate <b>OR</b> Consolidate and Extend</p> <p><b>Assessment:</b> chemical reactions chapter test</p>	
<b>Additional</b>	<b>5CWadd6</b> research ways that are used to restore and prevent corrosion of submerged objects	<p><b>Research task/homework</b> Research ways that are used to restore and prevent corrosion of submerged objects</p>		
	<b>5CWadd7</b> investigate the processes involved in the production of new materials from synthetic fibres	<p><b>Research task/homework</b> Investigate the processes involved in the production of new materials from synthetic fibres</p>		
	<b>5CWadd8</b> evaluate, using scientific evidence, the claims, explanations or predictions made in the media or advertising in relation to a substance, material or product	<p><b>Research task/homework</b> evaluate, using scientific evidence, the claims, explanations or predictions made in the media or advertising in relation to a substance, material or product</p>		
	<b>5CWadd9</b> construct simple electrochemical cells using fruit and describe energy transfer	<p><b>First-hand investigation:</b> Construct simple electrochemical cells using fruit and describe energy transfer</p>		
	<b>5CWadd10</b> research the structure of small portable electrochemical cells, eg mercury cells and rechargeable batteries	<p><b>Research task/homework</b> Research the structure of small portable electrochemical cells, eg mercury cells and rechargeable batteries</p>		



# Year 10: Chemical World-Chemical Reactions

	Check	Date
<b>Revise assumed knowledge:</b> <b>SC4-16CW</b> describes the observed properties and behaviour of matter, using scientific models and theories about the motion and arrangement of particles  <b>SC4-17CW</b> explains how scientific understanding of, and discoveries about the properties of elements, compounds and mixtures relate to their uses in everyday life	<input type="checkbox"/>	
<b>CW3 Chemical reactions involve rearranging atoms to form new substances; during a chemical reaction mass is not created or destroyed. (ACSSU178)</b>		
<b>CHANGING MATTER WITH CHEMICAL REACTIONS</b>		
<b>5CW3a. recall that all matter is composed of atoms and has mass</b>	<input type="checkbox"/>	
<b>Define</b> the terms matter, atom, element and mass	<input type="checkbox"/>	
<b>Identify</b> that all matter is made up of atoms that have mass	<input type="checkbox"/>	
<b>Identify</b> that atoms of different elements have different structures	<input type="checkbox"/>	
<b>5CW3b. identify a range of compounds using their common names and chemical formulae</b>	<input type="checkbox"/>	
<b>Define</b> the terms compound, ionic and covalent	<input type="checkbox"/>	
<b>Distinguish</b> between ionic and covalent compounds	<input type="checkbox"/>	
<b>Identify</b> a range of compounds using their common names and chemical formulae	<input type="checkbox"/>	
<b>LITERACY SET 1: COSMOS ARTICLE</b>		
<b>5CW3f. construct word equations from observations and written descriptions of a range of chemical reactions</b> 🗨️	<input type="checkbox"/>	
<b>Define</b> the terms physical and chemical change	<input type="checkbox"/>	
<b>Identify</b> signs of a chemical reaction e.g. colour change, temperature change, gas given off	<input type="checkbox"/>	
Construct word equations based on simple chemical reactions	<input type="checkbox"/>	
<b>CODE: 10CW1 First-hand investigation: Magnesium + oxygen</b>	<input type="checkbox"/>	
<b>CODE: 10CW2 First-hand investigation: Magnesium + HCl</b>	<input type="checkbox"/>	
<b>LITERACY SET 2: MIXED ACTIVITIES</b>		
<b>5CW3g. deduce that new substances are formed during chemical reactions by rearranging atoms rather than creating or destroying them</b>	<input type="checkbox"/>	
<b>Define</b> the terms reactants, products, conservation and mass	<input type="checkbox"/>	
<b>Describe</b> the law of conservation of mass	<input type="checkbox"/>	
<b>CODE: 10CW3 First-hand investigation: Law of Conservation of mass</b> (Oxford pg112)	<input type="checkbox"/>	
<b>Assessment: Oxford online test-</b> Changing matter with chemical reactions Students to achieve 100% in Support and Consolidate <b>OR</b> Consolidate and Extend	<input type="checkbox"/>	
<b>CLASSIFYING CHEMICAL REACTIONS</b>		
<b>5CW3c. classify compounds into groups based on common chemical characteristics</b>	<input type="checkbox"/>	
<b>Define</b> the terms acids, bases, salts, pH and indicator	<input type="checkbox"/>	
<b>Identify</b> the key chemical properties of acids, bases and salts	<input type="checkbox"/>	
<b>Identify</b> two examples of an acid, base and salt	<input type="checkbox"/>	

Identify indicator colours and pH values associated with acids and bases	<input type="checkbox"/>	
CODE: 10CW4 First-hand investigation: Testing pH.	<input type="checkbox"/>	
CODE: 10CW5 First-hand investigation: Making a pH indicator (Oxford pg120)	<input type="checkbox"/>	
<i>5CW3d. investigate a range of types of important chemical reactions that occur in non-living systems and involve energy transfer, including: combustion (ACSSU179), the reaction of acids including metals and carbonates (ACSSU179), corrosion, precipitation and neutralisation</i>	<input type="checkbox"/>	
Define the term <u>neutralisation</u>	<input type="checkbox"/>	
Identify the general word equation, and provide an example of a <u>neutralisation</u> reaction	<input type="checkbox"/>	
CODE: 10CW6 First-hand investigation: Neutralisation (Oxford pg122)	<input type="checkbox"/>	
Identify the general word equation, and provide an example of an ' <u>acid on metals</u> ' reaction	<input type="checkbox"/>	
CODE: 10CW7 First-hand investigation: Acid on metals (Oxford pg123)	<input type="checkbox"/>	
Identify the general word equation, and provide an example of an ' <u>acid on carbonates</u> ' reaction	<input type="checkbox"/>	
CODE: 10CW8 First-hand investigation: Acid on carbonates	<input type="checkbox"/>	
Define the term <u>corrosion</u>	<input type="checkbox"/>	
Identify the general word equation, and provide an example of a <u>corrosion</u> reaction	<input type="checkbox"/>	
CODE: 10CW9 First-hand investigation: Corrosion (Oxford pg126)	<input type="checkbox"/>	
Define the terms <u>displacement</u> and <u>precipitation</u>	<input type="checkbox"/>	
Identify the general word equation, and provide an example of a <u>displacement &amp; precipitation</u> reaction	<input type="checkbox"/>	
CODE: 10CW10 First-hand investigation: Displacement & Precipitation (Oxford pg130)	<input type="checkbox"/>	
Define the term <u>decomposition</u>	<input type="checkbox"/>	
Identify the general word equation, and provide an example of a <u>decomposition</u> reaction	<input type="checkbox"/>	
CODE: 10CW11 First-hand investigation: Decomposition (Oxford pg131)	<input type="checkbox"/>	
CODE: 10CW12 First-hand investigation: Modelling. Using a molymod kit for the above reactions	<input type="checkbox"/>	
NUMERACY AND SKILLS SET	<input type="checkbox"/>	
Assessment: Oxford online test- Classifying chemical reactions Students to achieve 100% in Support and Consolidate <b>OR</b> Consolidate and Extend	<input type="checkbox"/>	
<b>CHEMICAL REACTIONS IN LIFE</b>		
<i>5CW3e. identify some examples of important chemical reactions that occur in living systems and involve energy transfer, including respiration and reactions involving acids such as occur during digestion (ACSSU179)</i>	<input type="checkbox"/>	
Define the terms energy, respiration, photosynthesis and digestion	<input type="checkbox"/>	
Identify how acids and bases aid in digestion	<input type="checkbox"/>	
Identify chemical reactions involved in aerobic and anaerobic respiration and photosynthesis	<input type="checkbox"/>	
Compare and contrast the reactions of respiration and photosynthesis	<input type="checkbox"/>	
CODE: 10CW13 First-hand investigation: Testing for carbon dioxide produced during respiration (Oxford pg137)	<input type="checkbox"/>	
Identify whether energy is released or required by respiration and photosynthesis	<input type="checkbox"/>	
Assessment: Oxford online test- Chemical reactions in life Students to achieve 100% in Support and Consolidate <b>OR</b> Consolidate and Extend	<input type="checkbox"/>	
Assessment: chemical reactions chapter test	<input type="checkbox"/>	