

## Year 9 Curriculum Area – Combined Science – Chemistry

What concepts will we be covering this half term?

### Curriculum mapping for students

#### Key concepts:

#### Chemistry: Topic C2 – Periodic Table

Development of the periodic table  
Electronic Structure and the Periodic Table  
Group 1 – Alkali metals  
Group 7 – Halogens  
Explaining Trends

#### Chemistry: Topic C3 – Structure and Bonding

States of Matter  
Atoms into Ions  
Ionic Bonding  
Giant Ionic Structures  
Covalent Bonding  
Structure of simple molecules  
Giant Covalent Structures  
Fullerenes and Graphene  
Bonding and Metals  
Giant Metallic Structures

#### Physics: Topic P1 – Conservation and Dissipation of Energy

Changes in Energy Stores  
Conservation of Energy  
Energy and Work  
Gravitational Potential Energy Stores  
Kinetic Energy and Elastic Energy Stores  
Energy Dissipation  
Energy and Efficiency  
Electrical Appliances  
Energy and Power

#### Physics: Topic P2 – Energy Transfer by Heating

Energy Transfer by Conduction  
Specific Heat Capacity  
Heating and Insulating Buildings

#### Physics: Topic P3 – Energy Resources

Energy Demands  
Energy from Wind and Water  
Power from the sun and the Earth  
Energy and the Environment  
Big Energy Issues

What resources can you use to support your learning?

**BBC website:** Any resources not on Oak Academy links will be found here.

**Chemistry:** <https://www.bbc.co.uk/bitesize/examspecs/z8xtmnb>

**Oak National Academy:**

## Chemistry:

### Chemistry: Topic C2 – Periodic Table

Development of the periodic table

<https://classroom.thenational.academy/lessons/periodic-table-development-6cwp8t>

In this lesson, we will describe the main features of the modern periodic table, describe early versions of the periodic table, and then compare the modern periodic table with the early periodic tables.

Electronic Structure and the Periodic Table

<https://classroom.thenational.academy/lessons/electron-configuration-and-the-periodic-table-61jp4c>

In this lesson, we will explain why the charge of an atom is neutral. Draw and write the electron configuration of atoms and explain how electron configuration is linked to the group number.

<https://classroom.thenational.academy/lessons/why-elements-react-6cuk4d>

Group 1 – Alkali metals

<https://classroom.thenational.academy/lessons/group-1-cdk68r>

In this lesson, we will describe the trends in the physical properties of group 1 elements, and the reactions of group 1 metals with water and oxygen.

Group 7 – Halogens

<https://classroom.thenational.academy/lessons/group-7-c5h36c>

In this lesson, we will describe and explain the trends in the physical properties of group 7 elements.

Explaining Trends

<https://classroom.thenational.academy/lessons/comparing-the-reactivities-of-group-1-and-7-elements-6tjpac>

In this lesson, we will use electron configuration to explain trends in reactivity in both group 1 and group 7 elements.

### Chemistry: Topic C3 – Structure and Bonding

States of Matter

<https://classroom.thenational.academy/lessons/solids-liquids-and-gases-cmr36d>

This lesson will overlap with the particle model of matter from physics. It will discuss what happens when substances melt and boil. For higher tier it will explain why our models of particles are limited and the issues this can cause.

<https://classroom.thenational.academy/lessons/particle-models-6tj34r>

In this lesson we will recap key stage 3 knowledge of the 3 states of matter and relate this to particle models.

## Ionic Bonding

<https://classroom.thenational.academy/lessons/ionic-bonding-introduction-70wk4c>

This lesson will recap some relevant aspects of atomic structure and the rules for the formation of ions. It will then talk about formation of ionic bonds.

<https://classroom.thenational.academy/lessons/further-ionic-bonding-6cu32c>

This lesson will build on lesson one to show how to draw ionic compounds which are not a 1:1 ratio. It will also discuss how to write answers to these types of problems.

<https://classroom.thenational.academy/lessons/properties-of-ionic-compounds-6hj66c>

This lesson will describe the properties of ionic compounds and how they can be explained by how ionic compounds form.

## Covalent Bonding

<https://classroom.thenational.academy/lessons/covalent-bonding-65hpcc>

This lesson will introduce covalent bonding and explain why elements bond covalently.

## Structure of simple molecules

<https://classroom.thenational.academy/lessons/simple-covalent-molecules-70v66e>

This lesson will describe the bonding and properties of simple covalent molecules.

## Giant Covalent Structures

<https://classroom.thenational.academy/lessons/the-giant-covalent-structures-c5h3cc>

This lesson will introduce giant covalent macromolecules and describe the physical properties of the main forms of carbon; graphite and diamond. It will link these properties to their bonding.

## Fullerenes and Graphene

<https://classroom.thenational.academy/lessons/giant-covalent-structures-graphene-68rp6e>

This lesson introduces the fullerene family of carbon compounds. It describes their structure and properties. It tells the story of the discovery of graphene and the scientists involved.

## Bonding and Metals

<https://classroom.thenational.academy/lessons/metallic-bonding-cdj0e>

This lesson will introduce metallic bonding and link it to a metal's typical physical properties. It will then explain how forming an alloy changes these properties by linking to an alloy structure.

## Physics: Topic P1

### Changes in energy Stores

<https://classroom.thenational.academy/lessons/energy-transfers-64upac>

In this lesson we are going to explore the 8 stores of energy, and the 4 pathways in which energy can be transferred. This will provide an overview to allow the consideration of transfers in more complex systems.

### Conservation of Energy

<https://classroom.thenational.academy/lessons/conservation-of-energy-71gk6c>

In this lesson we will be studying the law of conservation of energy with a focus on conservation of energy during transfers between the kinetic store and gravitational potential energy store.

## Energy and Work

<https://classroom.thenational.academy/lessons/forces-and-work-6ngkec>

In this lesson we define work done, introduce the equation for work done and use it to calculate force and distance.

## Gravitational Potential Energy Stores

<https://classroom.thenational.academy/lessons/the-gravitational-potential-store-crr6ar>

In this lesson we're going to start exploring the topic of energy stores and transfers. We're specifically going to be looking at the gravitational potential energy store, and how to calculate values of this.

## Kinetic Energy and Elastic Energy Stores

<https://classroom.thenational.academy/lessons/the-elastic-potential-store-70u62t>

In this lesson we will explore the elastic potential energy store. We will look at the factors that affect its value, and how to calculate this.

## Energy and Efficiency

<https://classroom.thenational.academy/lessons/efficiency-and-reducing-unwanted-energy-transfers-61jker>

In this lesson we will be exploring the topic of reducing energy losses. We will consider how this affects the efficiency of a system and use this in calculations.

## Electrical Appliances

<https://classroom.thenational.academy/lessons/domestic-electricity-review-c4wpcc>

In this lesson we will be reviewing the ideas of electricity in the home, power and the national grid. We will also be looking at synoptic style questions.

## Energy and Power

<https://classroom.thenational.academy/lessons/power-crvk4c>

In this lesson we will be looking at what defines the power of an object, and how to calculate power.

## **Physics: Topic P2 – Energy Transfer by Heating**

### Energy Transfer by Conduction

#### Specific Heat Capacity

<https://classroom.thenational.academy/lessons/specific-heat-capacity-chhp6r>

In this lesson we will be exploring the effects of adding energy to a system and its effect on temperature. We will look at how this leads to a definition of the property of specific heat capacity and how to calculate this for different materials.

<https://classroom.thenational.academy/lessons/specific-heat-capacity-required-practical-69j66r>

In this lesson we will be applying our understanding of specific heat capacity to complete one of the required practicals for the physics part of the course. We will perform an investigation to determine specific heat capacity, and in the process consider effects on uncertainty in our readings.

Heating and Insulating Buildings  
<https://classroom.thenational.academy/lessons/insulating-material-required-practical-part-1-ccukgr>  
 In this lesson we will look at developing a method to investigate the rate of cooling of water. We will focus on the key variables and actions required to be successful with this experiment.  
<https://classroom.thenational.academy/lessons/insulating-material-required-practical-part-2-71h3gc>  
 In this lesson we will analyse results from the insulating material required practical and look at how this then applies to exam question contexts.

**Physics: Topic P3 – Energy Resources**  
 Energy Demands  
 Energy from Wind and Water  
 Power from the sun and the Earth  
 Energy and the Environment  
 Big Energy Issues  
<https://classroom.thenational.academy/lessons/renewable-energy-resources-ccu6cr>  
 In this lesson we will be exploring the advantages and disadvantages of renewable energy resources. We will then compare their use with non-renewable resources.  
<https://classroom.thenational.academy/lessons/energy-review-6rtkgt>

<p>Tasks to complete so we can assess your understanding/ Key Performance Indicator tasks</p>	<ul style="list-style-type: none"> <li>• Complete any of the revision tasks, watch the videos and do the tests on the BBC bitesize page.</li> <li>• Complete the lessons on the oak national academy website – follow the lesson to watch the video and complete the activities and the quiz.</li> </ul>
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<p>What can you do if you need help/ support?</p>	<p>If you need help please email your teacher –  <a href="mailto:sfox2@netherthorpe.derbyshire.sch.uk">sfox2@netherthorpe.derbyshire.sch.uk</a>  <a href="mailto:gwatkins@netherthorpe.derbyshire.sch.uk">gwatkins@netherthorpe.derbyshire.sch.uk</a>  <a href="mailto:mraybold@netherthorpe.derbyshire.sch.uk">mraybold@netherthorpe.derbyshire.sch.uk</a>  <a href="mailto:sparry@netherthorpe.derbyshire.sch.uk">sparry@netherthorpe.derbyshire.sch.uk</a>  <a href="mailto:jmccammon@netherthorpe.derbyshire.sch.uk">jmccammon@netherthorpe.derbyshire.sch.uk</a>  <a href="mailto:shutton@netherthorpe.derbyshire.sch.uk">shutton@netherthorpe.derbyshire.sch.uk</a>  <a href="mailto:jcarr@netherthorpe.derbyshire.sch.uk">jcarr@netherthorpe.derbyshire.sch.uk</a>  <a href="mailto:pgreenwood@netherthorpe.derbyshire.sch.uk">pgreenwood@netherthorpe.derbyshire.sch.uk</a>  <a href="mailto:bchristmas@netherthorpe.derbyshire.sch.uk">bchristmas@netherthorpe.derbyshire.sch.uk</a>  <a href="mailto:nconnolly@netherthorpe.derbyshire.sch.uk">nconnolly@netherthorpe.derbyshire.sch.uk</a>  <a href="mailto:jroberts@netherthorpe.derbyshire.sch.uk">jroberts@netherthorpe.derbyshire.sch.uk</a></p>
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