

The topics in the Year 9 Science exam are:

1. Solids, liquids and gases
2. On the move
3. Food and digestion
4. Atoms and elements
5. Respiration – lungs and blood
6. How does electricity work?
7. Compounds and mixtures

There are revision checklists and further revision material inside each of the pupil booklets.

Topic	We are learning to:	😊	😐	😞
The three states of matter	Identify the three states of matter			

Solids, liquids and gases	Identify the different properties of solids, liquids and gases			
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	Draw diagrams to illustrate the arrangement of particles in the three states			
	Explain what happens to the particles during a change of state			

Diffusion	Identify diffusion			
	Explain what diffusion is			

Topic	We are learning to:	😊	😐	😞
Friction	State what causes Friction.			
	State the direction in which Friction acts.			
	State the definition of Friction.			
	Draw Friction force arrows onto diagrams to show the direction of Friction.			
	Identify situations when Friction is helpful or a nuisance.			

Topic	We are learning to:	😊	😐	😞
Reducing the effects of friction	Identify ways of reducing Friction.			
	Identify ways of increasing friction.			
	Describe how a change in situation can increase the Friction.			

Topic	We are learning to:	😊	😐	😞
Balanced and Unbalanced forces	Draw arrows to represent the size and direction of forces.			
	Identify when forces are balanced and unbalanced.			
	State what happens to an object when acted on by balanced Forces.			
	State what happens to an object when acted on by unbalanced forces.			
	State Newton's First Law			

Topic	We are learning to:	😊	😐	😞
Speed Trap	State the equation between Average Speed, distance travelled and time taken.			
	Use the equation between Average Speed, distance travelled and time taken to carry out calculations.			
	State the units of Speed.			

Topic	We are learning to:	😊	😐	😞
Journey Graphs	Interpret a Distance – time graph.			
	Draw a distance – time graph from information given.			
	Use information from a Distance – time Graph to calculate speed.			
	Use a Distance – time graph to describe an objects journey.			

Topic	We are learning to:	😊	😐	😞
Braking News	State the definition of Thinking Distance.			
	State the definition of Braking Distance.			
	State how to calculate the total braking distance.			
	Write down how total stopping distance can be increased.			
	Interpret a thinking distance/braking distance chart.			

Topic	We are learning to:	😊	😐	😞
Food	Know how to make a healthy food choice			
	Know the 7 nutrients necessary for good health			

Careers	Know about the work of a dietician			
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Food tests	To develop practical skills and to investigate the nutrients in food			
	To recall the test for starch and the test for sugars			
	To recall the test for protein and the test for fats			

Digestive system	Know the structures and functions of the digestive system			
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Enzymes	Investigate enzyme activity			
	Understand that enzymes help the digestion of food			

Energy from food	learn how to measure the energy content of food			
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Food choices	Understand that people and the media can influence food choices			
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Lesson	What we learned	☺		☹
1	• Matter is anything that occupies space			
	• Matter is made up of building blocks called elements			
	• Elements are made up of just one kind of atom			
	• An atom is the smallest particle of an element.			

2	<ul style="list-style-type: none"> The air contains chemical elements 			
	<ul style="list-style-type: none"> Each element has its own characteristics or properties 			
	<ul style="list-style-type: none"> How to make oxygen, hydrogen and carbon dioxide in the laboratory 			
	<ul style="list-style-type: none"> Some tests that can be used to identify gases 			

3	<ul style="list-style-type: none"> Learn the general atomic structure of an atom 			
	<ul style="list-style-type: none"> Recall the names and positions of three subatomic particles 			
	<ul style="list-style-type: none"> Recall the charge of each structure 			
	<ul style="list-style-type: none"> Know that each element has a unique atom structure 			
	<ul style="list-style-type: none"> Define atomic number 			

4	<ul style="list-style-type: none"> Elements can be sorted into metals and non-metals 			
	<ul style="list-style-type: none"> Elements were first arranged into groups of eight 			
	<ul style="list-style-type: none"> The Periodic Table was first put together by Dimitri Mendeleev 			
	<ul style="list-style-type: none"> The Periodic table helps us to predict the properties of elements with which we are not familiar. 			
	<ul style="list-style-type: none"> Know the properties of halogens, alkali metals & noble gases 			

5	<ul style="list-style-type: none"> Compounds are formed when 2 or more elements join together 			
	<ul style="list-style-type: none"> The smallest particle of a compound is called a molecule 			
	<ul style="list-style-type: none"> That compounds are different than the elements they are made of 			

6	<ul style="list-style-type: none"> Compounds are represented by chemical formula 			
	<ul style="list-style-type: none"> Chemical formula show how many of each element are present in a molecule 			

Respiration and Breathing

Recall definition of Aerobic Respiration

Recall Aerobic Respiration word equation



Understand that energy that is released during respiration may be used:

- to build larger molecules from smaller ones
- in animals, movement
- in mammals and birds, to maintain a steady body temp

Compare inhaled and exhaled air

Identify the parts of the breathing system:

— lungs, trachea, bronchi, bronchioles, alveoli, diaphragm, ribs and intercostal muscles

Describe the mechanism of ventilation in terms of changes in volume and pressure

Measure lung capacity

Describe the consequences of Smoking

Blood and The circulatory system

Recall that reactants and products of respiration are transported throughout the body in the bloodstream

Recall the structure of the circulatory system which has blood vessels and a pump

Describe the structure of arteries, veins and capillaries in terms of the thickness of the walls

Know that arteries carry blood from the heart and veins to the heart

Understand that capillaries are the exchange surface between the

cells and the blood
Describe the structure of the heart
Heart attacks can be caused by blood clots in the heart
The effects of exercise on the circulatory system
The relationship between heart beat, breathing rate and exercise

Topic	We are learning to:	😊	😐	😞
Electric Circuits	State that electrons have a negative charge and are attracted to the positive charge.			
	Describe electric circuits.			
	Recognise a complete working circuit.			

Electrical Components	Discuss the benefits of representing electrical components using symbols.			
	Draw and identify electrical components using symbols.			

Conductors and Insulators	State that conductive materials allow electricity to flow.			
	Know that insulators stop electricity flow.			
	Design and build a circuit to test if a material conducts electricity.			
	Categorise materials as conductors and insulators.			

Resistance	Describe resistance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	State the unit and symbol of resistance.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Define conductors and insulators in terms of resistance.			
	Build a dimmer switch.			
	Give examples of variable resistors in everyday life.			

Electric Current	Describe electric current as the flow of electrons.			
	Carry out a risk assessment on an electrical experiment.			
	Relate bulb brightness to current.			

Series and Parallel Circuits	Identify series and parallel circuits.			
	Describe what happens to current in series and parallel circuits.			
	Calculate the current at different places in a series and parallel circuit.			
	State the effect of removing a light bulb in each type of circuit.			

Topic	At the end of this booklet you should be able to:	😊	😐	😞
Element or compound?	Sort substances into elements and compounds			
	Interpret chemical formulae and relate the numbers to the number of atoms involved			
	Understand the idea of energy change during compound formation			
	Describe the formation of iron sulfide from its elements : iron and sulfur			

Why is the dome of Belfast City Hall green?	Describe how elements can react with the substances around them			
	Explain that metals often react with the elements in the air to form compounds			
	Know that metallic elements are often used to make buildings look attractive			
	Explain that thermal decomposition means to break down a compound using heat energy			

How do compounds react with each other?	Decide if a chemical reaction has taken place			
	Recognise that reactions can take place between compounds			
	Explain observations in terms of reacting particles			

What's in a bottle of mineral water?	Classify materials as elements, compounds and mixtures			
	Explain that mixtures do not have a fixed composition and cannot be represented by a chemical formula			
	Know that particles in a mixture are not chemically joined together			

What is a pure substance?	Know that elements and compounds melt and boil at a particular temperature			
	Explain how the melting and boiling points can be used to identify substances			
	Know that mixtures do not melt or boil at a fixed temperature			