AC1 : Key Outcomes – Year 7

Curriculum: Science

Excellence.
No Excuses.

Section	Knowledge Code:	Outcomes:	How students will demonstrate success:
1	S7.1.1 Particle model and prosperities of solid, liquid and gases	• Students will be able to Identify the different particle models for solids, liquids and gases • Students will be able to describe the properties of some solids, liquids and gases, linking them to the particle model • Students will be able to describe the forces acting between particles in a solid, liquid, and gas. • Students will be able to evaluate the limitations of the particle model of matter	• Students can label a particle model diagram • Students can accurately draw a particle model for solids, liquids and gases. • Students can list the properties of solids, liquids and gases • Students can explain why substances have certain properties in relation to the arrangement of their particles • Students can answer questions in relation to the shape and volume of a solid, liquid and gas relating to the forces acting and movement between the particles • Students can think independently about the limitations of the particle model, in particular that the particles within the substance are not solid spheres and that the forces between the particles are not represented.
2	S7.1.2 Brownian motion of gas	• Students will be able to recall how the particles in a solid, liquid and a gas behave • Students will be able to explain how 'Brownian motion' lead to the understanding of how particles move	• Students can compare how a substance would behave on the surface o f a solid compared to the surface of a liquid • Students can explain why pollen grains suspended on the surface of a liquid would move in a random motion using the movement and arrangement of particles in a liquid in their response.
3	S7.1.3 Diffusion	• Students can define the term concentration • Students will be able to describe the motion of diffusion in liquids and gases • Students can explain why diffusion can not occur in solids • Students can evaluate what impact changing the temperature will have on the speed of diffusion	• Students can identify on diagrams where particles are in high and low concentration • Students can predict and explain which direction gas particles will move depending on their concentration • Using diagrams and particle theory, students can explain why diffusion is not possible in solids • Using particle theory and kinetic theory students can predict what effect changing conditions such as temperature will have on the rate of diffusion.
4	S7.1.4 Gas pressure	• Students will be able to define the term pressure • Students will be able to describe what causes gas pressure • Students will be able to evaluate how to increase and decrease gas pressure	• Students can state what causes pressure • Using the movement of gas particles, students can discuss why gas pressure is caused • Using diagrams, students can identify which container would be under a larger pressure • Students can explain how gas pressure could be increased or decreased in certain situations/examples
5	S7.1.5 Pressure and volume	• Students will be able to identify Boyle's law • Students will be able to explain the link between the pressure and volume of a gas • Students will be able to use the Boyle's law equation to calculate changes in pressure and volume	• Students can recall the Boyle's law equation • Students can use the equation to perform simple calculations to calculate pressure or volume of a substance

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6	S7.1.6 Density	• Students will be able to define the term density • Students will be able to compare the density of things compared to water, if they float or sink • Students will be able to calculate the density of a regular shaped object. • Students will be able to determine the density of an irregular shaped object.	• Students will be able to state what density is and give some examples of substances that are dense and not dense • State that the density of a material is the mass per unit volume. • Students can use the particle arrangement of a substance to explain the substances density. • Students can recognise the word and symbol equation for density to calculate the density of objects • Students can discuss why you can not use the equation to calculate density for irregular shaped objects. • Students can recall the method for calculating density for an irregular shaped objects.
7	S7.1.7 Changing state	• Students will be able to identify the three states of matter • Students will be able to state which states of matter occur as a result of heating and cooling • Students will be able to identify the forces which exist between particles • Students will be able to explain what happens to the internal energy in a substance as it changes state • Students will be able to describe the changes in the energy of individual particles during changes of state.	• Students can follow a simple method to practically change the state of a substance from solid to gas, recording relevant data throughout • Students can identify which state of matter particles has the largest kinetic energy • Students can identify which state of matter particles has the strongest intermolecular force. • Students can use the terms kinetic energy and intermolecular force when describing the movement of particles in a substance. • Students can label which particles in the particle model have the most/least internal energy. • Students can explain in an extended writing task what happens to the internal energy of particles when a change of state occurs.
8	S7.1.8 Cooling curves	• Students will be able to use data identify the changes of state which can occur in a substance and also identify when a substance is changing state on a cooling curve	• Students can use data to determine when a substance has changed state. They can also identify what this looks like on a cooling curve • Students can accurately draw the axis for a graph and plot points
9	S7.1.9 What are atoms, elements and compounds	• Students will be able to define atoms, elements and compounds • Students will be able to explain the difference between atoms, elements and compounds, giving examples • Students will be able to explain the difference between a pure substance and a mixture	• Students can recall the definitions for atoms, elements and compounds. • Students can explain that only elements are found in the periodic table, and one of the limitations of an early version of the periodic table was that it contained some compounds • Students can draw and label diagrams showing pure substances and mixtures. • Students can name some simple compounds

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10	S7.1.10 Simple atomic model/sub atomic particles	• Students will be able to identify a simple atomic model • Students will be able to identify the differences in mass and charge in protons, neutrons and electrons	• Students can draw or label the structure of a simple atomic model. • Students can accurately use key terms such as: proton, neutron, electron, nucleus and shells when describing an atom. • Students can identify the difference in mass and charge between the three sub atomic particles • Students can identify where the sub atomic particles are found in an atom • Students can describe experiments scientists did to show the existence of sub atomic particles
11	S7.1.11 Symbols and molecular formula	• Students will be able to use the periodic table to find the symbols for some elements • Students will be able to identify the symbols for elements and some familiar compounds • Students will be able to write word equations for chemical reactions • Students will be able to write simple symbol equations	• Students can use the periodic table to give the symbols for some elements • Students can write word equations for reactions they know/have seen • Students can write accurate molecular formula for some compounds • Students can write symbol equations for reactions involving simple elements and compounds • Students can accurately use state symbols in a balanced symbol equation
12	S7.1.12 The difference between chemical and physical changes	• Students will be able to identify some chemical reactions and physical changes based on their observations • Students will be able to explain the difference between a chemical reaction and a physical change	• Students can give examples of physical changes and chemical reactions • Students can justify if something is a physical change or a chemical reaction and explain their reasoning.
13	S7.1.13 Conservation of mass	• Students will be able to state the law of conservation of mass • Students will be able to explain what happens to the mass of reactants and products during a chemical reaction • Students will be able to justify anomalies in data that suggests the law of conservation of mass is not true	• Students can calculate the given mass for a reaction given some data. • Students can predict the mass of the products given the mass of the reactants at the start of the reaction. • Students can accurately follow a method to test the law of the conservation of mass • Students can evaluate and justify why the law of conservation of mass might appear incorrect in some reactions
14	S7.1.14 Making solutions and Separation methods	• Students will be able to identify different methods for separating mixtures • Students will be able to justify the use of certain separation methods	• Students can identify different methods of separating a mixture • Students can make informed decisions about which separation method would be the most suitable • Students will be able to perform different separations methods practically • Students can evaluate why certain separation methods might be unsuitable