

Sc1 – Scientific Enquiry and Practical / Transferrable Skills

	B1	B2	B3	B4	B5	B6
Sc1a – Observations and Theory	I can observe a practical demonstration	I can think about why something happens and think about how I could prove it. I'm not always right.	I know that what I learn in science is true, because there is evidence (proof)	I can describe how scientists use their experiments, their data and their creative thinking to provide an scientific explanation.	In my own practical work, I can explain how the results I gather will support accepted scientific theory	I can describe the importance of scientific research in further refining scientific theory I can show an understanding of how scientists need to be aware of the ethics behind what they are doing.
Sc1b – Predictions and Fair Testing	I listen to the predictions of others, I might agree / disagree	I can make a prediction based on limited knowledge / understanding	In my practical work: I can carry out a fair test with help OR I can collect data with help	I can make a prediction and link it to what I have learnt in science lessons.	In my practical work: I can carry out a fair test AND collect data independently.	In my practical work: ● I can make a prediction linked to what I have learnt ● decide on how to carry out a fair test independently ● collect data independently ● describe what I have found out.
Sc1c – Method, Variables, Repeats	I can follow a simple method step by step	I can follow a simple method following demonstration	I can follow a multi step method following demonstration	I can identify the things I need to keep the same, and the thing I need to change in a fair test. I am beginning to write my own methods	I do two or more tests for the same experiment	I carry out at least 5 repeats for each test and create a table of results with averages.
Sc1d – Equipment and Measurement	I can use simple equipment (e.g. magnifying glasses) to make a simple observation.	I choose the correct equipment to make observations and measurements for my practical.	I select apparatus for a range of tasks and plan to use it correctly	I make observations, comparisons or measurements accurately, using correct units e.g. cm.	I measure a variety of quantities with precision, using instruments that have decimal values e.g. weighing scales, rulers, stopclocks.	I measure a variety of quantities consistently, recording to the same place value where appropriate and calculating mean values when required
Sc1e – Data Collection	I can record my results in a table the teacher has given me.	I can record my results in a table or a bar chart with some help	I can record my observations, comparisons and measurements using tables and bar charts independently	I can present data in a line graph that has pre-prepared axis'	I can present data in a line graph that I make myself. There may be some errors I can identify anomalous results.	I present accurate data in an appropriate format, scaled correctly, highlighting any anomalous results
Sc1f – Conclusion	I can say what happened in a practical	I say if what happened in a practical is what I thought would happen.	I can say what happened using my results to help me.	I can say what happened, using my results to help me, and describe a relationship in the work I have done	My conclusion is based on what my evidence shows. I can use scientific knowledge to support my conclusion.	My conclusion matches what my evidence shows. I can use scientific knowledge to support my conclusion and can add diagrams to further support my evidence.

<p>Sc1g - Evaluation</p>	<p>I can say simply what I have found out.</p>	<p>I can use scientific language to say what I have found out, and with help, suggest how I could make my practical more reliable</p>	<p>I can suggest how to improve my work, and say why I think this would improve the results. I'm not always right.</p>	<p>I make correct decisions on how to improve my practical work, describing why the improvements will make the practical better.</p>	<p>I evaluate my practical work in terms of fair test and results collected. I explain how I could further the practical to gather more data to support my learning.</p>	<p>My evaluation is based on validity and reliability. Where possible, I suggest further improvements to the practical to gain a greater depth of understanding.</p>
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Sc2 – Biological Science

	B1	B2	B3	B4	B5	B6
SC2a – life processes, staying healthy	<p>I can show an acknowledgement of hunger/pain/needing the toilet/feeling hot or cold</p> <p>I can water a plant, give it sunlight</p> <p>I can care for animals by feeding them, petting them, cleaning them</p>	<p>I can state 2 or more things that an animal and plant need in order to live</p>	<p>I can identify whether something is alive or dead based on what it is doing / not doing</p>	<p>I can name and describe the seven life processes using given examples</p>	<p>I can explain the importance of a balanced diet, and provide examples of balanced diets from different cultures</p>	<p>I can plan, carry out and reflect on an exercise regime, explaining the importance of keeping fit on health and wellbeing.</p>
Sc12b – Plants for Life	<p>I can group plants simply e.g. flowers and trees.</p>	<p>I can identify the main visible organs of plants (root, shoot, flower)</p> <p>I can identify a deciduous tree from an evergreen, and make comparisons</p>	<p>I can identify the main plant reproductive organs (stamen, stigma, anther) and demonstrate the plant reproductive cycle</p>	<p>I know the equation for photosynthesis, and can identify where each of the reactants, products and catalysts are located.</p> <p>I can identify the main parts of a leaf, and explain their role in photosynthesis</p>	<p>I can describe the process of transpiration and why this is important to the plants survival</p>	<p>I can explain what limiting factors are in relation to photosynthesis and transpiration.</p>
Sc2c – Life Cycles	<p>I can acknowledge a difference in age e.g. older than, younger than.</p>	<p>I recognise that living things grow, and can reproduce</p>	<p>I can identify stages within a human life cycle (minimum 2)</p>	<p>I can correctly order the stages of the human life cycle (birth, childhood, adolescence, adulthood, death) and describe key elements of some of these stages.</p> <p>I can correctly order the stages of the plant life cycle (seed, germination, flowering, fruiting, death) and describe key elements of some of these stages.</p>	<p>I can explain similarities and differences between human and plant life cycles</p>	<p>I can explain what dormancy means and its importance in the plant life cycle.</p> <p>I can explain why dormancy occurs in bacteria</p>

Sc2d – Human Anatomy	<p>I can identify major body parts e.g. arm, leg</p> <p>I can locate these major body parts on my body</p>	<p>I use scientific names for some major organs inside the body e.g. heart, stomach.</p> <p>I can identify the positions of these organs in the human body.</p>	<p>I can describe the role of five main internal organs (heart, lungs, kidneys, stomach, brain).</p>	<p>I can group organs based on how they work together e.g. digestive system. Special reference to nervous system and senses / sense organs.</p>	<p>I can describe the main functions of organ systems in the human body.</p> <p>I can explain how organs are made up of tissues, with tissue being made up of different cells (named examples; heart and skin)</p>	<p>I can draw and describe simple animal cell structure, explaining how a variety of specialised cells are needed to create an organism.</p>
Sc2e – Plant Physiology	<p>I can identify major plant parts e.g. flower, leaf</p> <p>I can locate these plant parts on a diagram or real plant</p>	<p>I use scientific names for some major organs of the plant e.g. anther, stamen, root</p> <p>I can identify the positions of these plant parts on a diagram</p>	<p>I can describe the role of five main plant reproductive organs (anther, stamen, stigma, style, ovary, carpel)</p>	<p>I can group plant organs based on how they work together e.g. roots and shoots for transport, leaves for gas exchange</p>	<p>I can name and describe the roles of specialised plant cells (root hair, guard cell, xylem, phloem)</p>	<p>I can explain why plants show a variety in leaf shape and structure (e.g. cactus needles, variegated leaves etc)</p>
Sc2f – Classification	<p>I can group living things simply, e.g. animals that have/don't have fur</p>	<p>I can state why some living things change, e.g. leaves in autumn.</p> <p>I can describe why I have grouped living things in a certain way</p>	<p>I can use keys based on what I can see to identify and group living things.</p>	<p>I recognise that there is a lot of variation in living things, and this is why we classify organisms</p> <p>I can describe what inheritance is</p>	<p>I can describe some of the causes of variation between living things based on environment</p>	<p>I can explain how variation is caused by genetics and how variation can lead to evolution.</p>
Sc2g – Environment and Feeding Relationships	<p>I recognise that different living things are found in different places</p>	<p>I can identify ways in which an animal is suited to its environment e.g. fur thickness</p>	<p>I can make a food chain to show the relationship between predators and prey</p>	<p>I can explain that different organisms are found in different habitats because of differences in environmental factors e.g. temperature.</p>	<p>I can construct a food web to explain the process of interdependence</p>	<p>I can use pyramids of biomass and number to explain the relationships between predators and prey</p>
Sc2h – Health and Disease	<p>I can state when I am feeling well, poorly, tired</p>	<p>I can describe why it is important to wash my hands before eating and after going to the toilet. Talking specifically about bacteria</p>	<p>I can make a link between a person being ill, and the spread of disease through coughing, sneezing, or poor hygiene.</p>	<p>I can draw, label, and compare 3 main groups of organisms (bacteria, fungi, virus)</p>	<p>I can explain how antibiotics work against bacteria and some fungi, but not against viruses.</p>	<p>I can explain the importance of vaccination programmes in the fight against named diseases e.g. MMR, Smallpox</p>

Sc3 – Chemical Science

	B1	B2	B3	B4	B5	B6
Sc3a Chemical Structure	I can identify materials I use e.g. wood, metal.	I can correctly suggest uses for materials	I can group materials together simply based on their visual properties e.g. shiny, bendy.	I can describe the chemical properties of materials e.g. as a solid, malleable, heat conductance	I can compare the chemical properties of a number of different materials based on their chemical structure (e.g. diamond/graphite)	I can explain how the chemical structure of a material allows the material to perform the way it does
Sc3b - SLG	I can identify wood as a solid, water as a liquid, and air as a gas	I can group different materials as solid, liquid or gas	I can describe the properties of solids, liquids and gases (shape and volume) in relation to the particles within them	I can begin to name some of the elements within material e.g. water is hydrogen and oxygen,	I can explain what the periodic table is, and how it can be used to predict the behaviour of elements within it.	I can draw and label 5 examples of elements using the Dalton model, identifying neutrons, protons and electrons
Sc3c – Separation Techniques	I can separate two dried materials from each other e.g. dried peas and sand	I can demonstrate separation in a solution through evaporation	I can demonstrate separation of a solution through mass (chromatography)	I can describe why separation techniques work and given examples, can suggest and trial the most appropriate separation technique to use	I can demonstrate and explain how external factors e.g. heat impact upon elements and mixtures	I can explain the differences between elements, compounds and mixtures giving a variety of examples
Sc3d - Reactions	I can identify that a reaction has taken place (sensory cues)	I can suggest if a reaction is reversible or irreversible e.g. water melting, wood burning	I can identify and describe reversible and irreversible changes in everyday life e.g. baking a cake, diluting squash, cooking meat, making ice	I can describe how the amount of matter that goes into a reaction, is the same as what comes out (reactants and products)	I can describe what combustion is and how to tell if a combustion reaction has happened	I can explain the process of thermal decomposition and demonstrate this through specific practical work
Sc3e - Climate	I take part in recycling activities	I can talk about ways that I could save (or make) energy in my home	I can name 3 fossil fuels and say where they came from	I can name greenhouse gases and describe how they contribute to the greenhouse effect.	I can explain the importance of carbon sinks	Using data, I can explain the link between rising sea levels, deforestation and rising global temperatures to greenhouse gas production.

Sc4 – Physical Science

	B1	B2	B3	B4	B5	B6
Sc4a - Forces	I can identify that something is moving, or not moving	I can distinguish between objects moving as a result of pushing, or pulling	I can describe what the terms balanced and unbalanced forces means, using diagrams to help my description	I can measure forces using appropriate equipment and units	I can explain what the terms equilibrium and deformation mean using Hooke's law as an example	I can explain what pressure is, and how it can affect gases and liquids
Sc4b - Magnetism	I can identify magnets and show simply what they can do	I state the ability of a magnet to attract and repel	I can draw magnetic field lines, identifying the poles	I can describe what a permanent magnet is, identifying the main magnetic materials	I can make a simple electromagnet and describe how it works	I can apply my knowledge of electromagnets to large scale energy production
Sc4c – Speed/ Distance/ Time	I can identify something as speeding up, slowing down, or standing still	I can identify something as moving at constant speed	I can describe the differences between speeding up, slowing down and constant speed in terms of forces	I can describe the relationship between speed, distance and time using correct units	I can draw and interpret distance / time graphs	I can predict how the motion of an object will change dependent on the forces acting upon it.
Sc4d - Energy	I can identify things that need energy to work	I can name three examples of energy (at least one renewable)	I can name all the different types of energy store and give examples of where they are used	I can describe how energy can be wasted e.g. a kettle making noise, a torch getting warm	I can draw diagrams to show energy transfer and energy wastage	I can show how an energy store can be changed into another e.g. by a car moving, or by a parachute falling
Sc4e - Waves	I can give examples of things that make light and sound	I can state what happens to sound when it travels over a distance, and what happens to light when it travels through solids, liquids and gases.	I can describe what reflection, refraction and dispersion mean	I can simply compare the properties of light and sound waves (limited to presence/lack of particles, generation of heat energy)	I can describe the properties of sound waves, and can explain what pitch, amplitude and frequency mean. I can describe the properties of light waves and can explain what wavelength means.	I can use my understanding of light waves to explain the concept of the electromagnetic spectrum, giving examples of wavelength use in industry.

Using the new science levels:

Where these levels fit in:

Life skills Functional Science Levels 1-4	New B levels	GCSE specification criteria
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Dependent on the ability of the group, teachers may start with the FS levels and move into B levels, or start straight onto B levels.

The levels have been split into 4 separate subjects:

- Practical skills
- Biology
- Chemistry
- Physics

Wherever possible, the academics (biology, chemistry, physics) should be taught through the practical skills. This way two sets of levels can be assessed at any one time.

The academics are made up of 18 individual units, which should be spread over 18 terms (3 academic years) meaning there is fair coverage of all disciplines and the opportunity to revisit concepts 3 times in total from EYFS to the end of KS3

Biology has an additional 3 units to support personal care and life skills, and may form part of assessment in other lessons e.g. PSHE or PE

Transition to KS4 subjects:

At TMS, the following qualification courses are offered:

- ELC Science (AQA)
- GCSE Double science (AQA Trilogy)
- GCSE Biology (AQA)
- GCSE Chemistry (AQA)
- GCSE Physics (AQA)

The following guidelines apply when discussing transition to qualifications.

B level working at end Y8	Qualification level	Course	Predicted grade
B1/2	ELC	ELC Science	EL 2/3
B3/4	Taught to GCSE foundation, dual entered on ELC	GCSE Trilogy, ELC Science	GCSE 1 – 3
B5/6	GCSE	GCSE single sciences (based on individual attainment)	GCSE 2 – 6
GCSE Specifications	GCSE with elements of A level content	GCSE single sciences	GCSE 5 – 9