TCS KS3 Science Curriculum

Biology

Year 7

	Outline of Course	Key Assessments	Key Skills
Autumn 1	**Cells and Movement**	• Initial assessment • End Knowledge and Understanding assessment	Building on KS2 parts of animals and plants. State organelles and their function of animal and plant cells. Safe handling of a microscope. Describe structure and function of skeleton and muscles.
Autumn 2	**Cells and Movement**	• Block test	
Spring 1	**Digestion and Breathing**	• Initial assessment • End Knowledge and Understanding assessment	Building on KS2 parts of digestive and circulatory system. State function of all organs in digestive and circulatory system. Explain why certain nutrients are needed in a balanced diet. Describe how nutrients are removed from intestine and how gas exchange occurs using a pressure model.
Spring 2	**Digestion and Breathing**	• Block test	
Summer 1	**Ecosystems**	Initial assessment End Knowledge and Understanding assessment	Building on KS2 food chains, adaptation, and classification. Explain interdependence using food webs. Describe how toxins can accumulate. Describe photosynthesis and explain the dependence of almost all life on photosynthetic organisms.
Summer 2	**Ecosystems**	PPE	

Year 8

	Outline of Course	Key Assessments	Skill Development
Autumn 1	**Human Reproduction and Inheritance**	Initial assessment End Knowledge and Understanding assessment	Building on KS2 life cycles of animals and plants. State name and function of parts of the male and female reproductive system. State name and function of parts of flowers.
Autumn 2	**Human Reproduction and Inheritance**	Block test	
Spring 1	**Variation and Evolution**	Initial assessment End Knowledge and Understanding assessment	Building on KS2 variation and evolution. Describing and graphing continuous and discontinuous data. Model the role of genes and chromosomes in heredity.
Spring 2	**Variation and Evolution**	Block test	
Summer 1	**GCSE B1 (Cell Biology)** Cell structure Microscopy	Initial assessment Progress check	Builds on Cells and Movements unit in KS3 Calculate magnification. State function and use of stem cells
Summer 2	Mitosis Stem cells	PPE	

Year 9

	Outline of Course	Key Assessments	Skill Development

Autumn 1	**GCSE B1 (Cell Biology)** (finish, add active transport) Diffusion Osmosis Active transport **GCSE B2 (Organisation)** – plants section now moved to B4 Digestive system	Initial assessment Progress check End point Knowledge test	B2 builds on KS3 unit digestion and breathing Use quantitative methods for recording enzymatic digestion. Describe how cancer can develop. Qualitatively explore the nutrients present in food. Interpret graphical representations of health statistics.
Autumn 2	**GCSE B2 (Organisation)** Circulatory system Non-communicable disease	Progress check	
Spring 1		Progress check	
Spring 2		Progress check End point Knowledge test	
Summer 1	**GCSE B3 (Infection and Response)** Pathogens	Initial assessment Progress check	B3 links to KS2 topics on Health and PSHE Describe how pathogens infect animals and plants.
Summer 2	Human defence systems Vaccination Medicinal drugs	Progress check End point Knowledge test PPE	Explain how vaccines can produce an immune response.

Chemistry

Year 7 **Practical investigation for the unit**

	Outline of Course/ Number of lessons	**Key Assessments** *(End point task)*	**Skill Development** *(How does this unit build on prior knowledge?)*
Autumn 1	**Earth and Atmosphere** (Rock types and cycle) **Climate* **Earth Structure* 10 Lessons	Initial assessment End Knowledge and Understanding assessment	Volcanoes and Earthquakes – KS2 Draw a scale diagram of the Earth Describe and explain how the different types of rocks are formed Describe the composition of the atmosphere in terms of percentages
Autumn 2	**States of Matter** (Particles diagrams and properties) **Particle model* 10 lessons	Initial assessment End Knowledge and Understanding assessment Block test	Particle diagrams – KS2 Draw particle diagrams for the three states of matter Describe the properties of matter Measure or research the temperature at which state changes happen in degrees Celsius (°C)
Spring 1	**Mixtures and Separating** (Mixtures vs compounds, and the separating techniques) **Separating mixtures* 14 lessons	Initial assessment End Knowledge and Understanding assessment	Dissolving and solubility – KS2 Define mixtures and compounds Name the different types of separating mixtures, and describe how they work Carry out the separation of different mixtures
Spring 2		Initial assessment End Knowledge and Understanding assessment Block test	
Summer 1	**pH Scale and neutralisation** (Acids and alkalis, the pH scale, measuring pH) **Acids and alkalis* 12 lessons	Initial assessment End Knowledge and Understanding assessment	Vinegar and Bicarb volcanoes; Kitchen chemistry – KS2 Using the pH scale to estimate the pH of solutions To investigate the neutralisation of a substance
Summer 2		PPE	

Year 8 **Practical investigation for the unit**

	Outline of Course/ Number of lessons	**Key Assessments** *(End point task)*	**Skill Development** *(How does this unit build on prior knowledge?)*
Autumn 1	**Recycling, Finite and renewable resources and life cycle assessment**	Initial assessment End Knowledge and Understanding assessment	PSHE - KS2 Explain how and why we recycle materials

	(Three R's, oil, coal and gas, product life cycles) 9 lessons		Discuss what affects the life cycle assessment of a product
Autumn 2	(To be started after previous unit) **Metals and non-metals and metallic bonding** (Structure and properties) **Elements* 14 lessons	Initial assessment End Knowledge and Understanding assessment Block test	Properties of materials (flexible, stretch etc) – KS2 Describe the properties of metal and non-metal substances Explain how the bonding of a metal affects its properties
Spring 1	**Reactivity Series and Corrosion** **Earth Resources* **Metals and non-metals* 15 lessons	Initial assessment End Knowledge and Understanding assessment	Metals and non-metals (previous KS3 unit) Investigate the reactivity of metals
Spring 2		Block test	Explain the corrosion of metals in chemical terms
Summer 1	**Structure of the atom and Periodic table** (Structure and history of the atom and the development of the periodic table (13 lessons)	Initial assessment End Knowledge and Understanding assessment	Building on KS2 and 3 particles Explain how the structure of the atom has changed over time
Summer 2		PPE	Explain how the periodic table has developed over time

Year 9 **Practical investigation for the unit**

	Outline of Course/ Number of lessons	**Key Assessments** *(End point task)*	**Skill Development** *(How does this unit build on prior knowledge?)*
Autumn 1	**Compounds and Equations** (Naming compounds, conservation of mass, balancing equations) 11 lessons	Initial assessment Progress check End point Knowledge test	Building on structure of the atom – KS3 Balancing chemical equations Defining the conservation of mass, and explain why it is important
Autumn 2	**Electrons and Groups** (Electronic structure, the formation of ions, Groups 1, 7 and 0) 13 lessons – will lead into spring term	Initial assessment Progress check End point Knowledge test	Building on structure of the atom – KS3 Drawing the electron structure of the first 20 elements Explain the reactivity of the elements in groups 0, 1 and 7. Draw ions of metals and non-metals
Spring 1	**Bonding and Structure** (Ionic bonding and properties, Covalent bonding and properties incl. simple, giant & allotropes) 13 lessons	Initial assessment Progress check	States of matter – KS3 Describe the bonding, structure of ionic and covalent substances Explain the properties of ionic and covalent substances
Spring 2		Progress check End point Knowledge test	

Summer 1	**Acids and bases** (pH scale investigation to recall year 7 work, bases, and making salts) **Making salts* **Titrations – H only* 13 lessons	Initial assessment Progress check	pH scale and neutralisation – KS3 Describe the difference between acids and bases in terms of ions Making a soluble salt from an insoluble base
Summer 2		Progress check End point Knowledge test PPE	

Physics

Year 7

	Outline of Course/ SOW delivery	**Key Assessments** *(End point task)*	**Skill Development** *(How does this unit build on prior knowledge?)*
Autumn 1	Forces 1 – **speed, gravity and space**	Initial assessment End Knowledge and Understanding assessment	KS2 objects fall due to gravity of Earth KS2 Movement of earth and planets studied, day and night explained. Interpreting distance-time graphs Calculating gravity Explaining how seasons manifest on earth
Autumn 2	Forces 1 - continued Energy 1 – **transfers and costs**	Initial assessment End Knowledge and Understanding assessment Block test	Energy not studied at KS2 Calculating fuel bills and costs Describing energy changes within a closed system
Spring 1	Energy 1 - continued Electricity 1 – **voltage and current**	Initial assessment End Knowledge and Understanding assessment	KS2 electrical circuits (series only studied so far, concept of voltage explored using more cells to brighten lamps etc) Describing current, voltage and resistance in an electrical circuit. Explaining static electricity in terms of charges.
Spring 2	Electricity - continued	Block test	
Summer 1	Waves 1 – **light and sound**	Initial assessment End Knowledge and Understanding assessment	KS2 Light and sound studied. Investigating reflection, refraction and dispersion. Describing colour in terms of frequencies of light.
Summer 2		PPE	

Year 8

	Outline of Course/SOW delivery	**Key Assessments** *(End point task)*	**Skill Development** *(How does this unit build on prior knowledge?)*
Autumn 1	Forces 2 – **contact forces, pressure**	Initial assessment End Knowledge and Understanding assessment	KS2 friction, air and water resistance Drawing force diagrams Calculating pressure Explaining how forces cause interact with objects
Autumn 2	Forces 2 - continued Electricity 2 – **magnets, electromagnets**	Initial assessment End Knowledge and Understanding assessment Block test	KS2 magnets with repulsion and attraction and classifying object as magnetic materials Drawing magnetic field Exploring the magnetic field of a current
Spring 1	Electricity 2 - continued Energy 2 – **work, heating and cooling**	Initial assessment End Knowledge and Understanding assessment	Energy has been introduced in year 7 (but not studied at KS2) Investigating how temperature differences lead to energy transfer Explaining conduction, convection and radiation as methods of transfer.
Spring 2	Energy 2 - continued	Initial assessment End Knowledge and Understanding assessment Block test	
Summer 1	Waves 2 – **wave effects, wave properties**	Initial assessment End Knowledge and Understanding assessment	KS2 Light and sound studied. Investigating how waves can be added together or cancelled out Stating the order of the EM spectrum
Summer 2	Waves 2 - continued	PPE	

Year 9

	Outline of Course/SOW delivery	**Key Assessments** *(End point task)*	**Skill Development** *(How does this unit build on prior knowledge?)*
Autumn 1	**P1: Energy** (8 lessons)	Initial assessment Progress check	Building on work done in year 7 and 8 to include mathematical equations Calculating kinetic, gravitational and elastic energy. Calculating power.
Autumn 2	**P1: Energy** (suspend RPA 2 for Physics until yr 11) (6 lessons)	Progress check	
Spring 1	**P1: Energy** (2 lessons) **P3: Particles** (extra for separates – pressure in gases,) (4 lessons)	End Knowledge and Understanding assessment Initial assessment Progress check	Building on Year 7 CHEMISTRY work Drawing particle diagrams to explain changes of state Investigating and calculating the density of regular and irregular solids Calculating energy changes involved in heating and cooling
Spring 2	**P3: Particles** (extra for separates – increasing pressure of a gas) (4 lessons)	End Knowledge and Understanding assessment	
Summer 1	**P2: Electricity** (extra for separates – Static Electricity) (6 lessons)	Initial assessment Progress check	Building on work done in year 7 and 8 to include mathematical equations Measuring resistance in circuits Drawing circuit diagrams Calculating power transfer
Summer 2	**P2: Electricity** (6 lessons)	End Knowledge and Understanding assessment PPE	