Science Year 8– Summer Term 2022

	What? **When?** **Why?**			
	BIOLOGY **8D Unicellular Organisms**	**CHEMISTRY** **8H Rocks**	**PHYSICS** **8K Energy Transfers**	**PHYSICS** **8L Earth & Space**
Lesson 1 Learning intentions	**<u>Microorganisms</u>** Recall the life processes (MRS GREN). Recall the five kingdoms of organisms. Recall the meaning of: multicellular, unicellular, microorganism. Identify organisms that are unicellular and those that are multicellular. Use the key characteristics of microorganism cell structure to classify microorganisms. Justify the lack of a virus kingdom.	**<u>Uses of rocks</u>** Recall some uses for rocks and some products made from limestone Recall what earthquakes and volcanoes are Explain why certain rocks are used for certain applications. Relate features of a landscape to the type of rock and how it has weathered.	**<u>Temperature changes (Internal energy, temperature and evaporation)</u>** Recall some units for measuring temperature. Recall that energy will be transferred by heating between materials at different temperatures. Identify the direction in which energy will be transferred in given circumstances. Recall the effect of evaporation on the temperature of the remaining liquid, and recall ways of reducing energy transfers by evaporation. Explain how internal energy and temperature are different. Describe the factors that determine the temperature of an object.	**<u>Seasons</u>** Describe differences in the seasons in terms of day length and the height of the Sun Explain the changes in day length and height of the Sun in terms of the tilt of the Earth's axis. Use a model to explain the changes in the seasons. Use a model to explain why the height of the Sun at noon and hours of daylight vary with latitude. Use a model to explain the pattern of light and dark at the poles. Explain the effect of the tilt of the Earth's axis on the energy received from the Sun.

			Describe the factors that affect the rate of transfer of energy by heating. Use the particle model of matter to explain energy transfer by evaporation from a surface. Convert between the kelvin and Celsius scales. Describe how the average kinetic energy of the particles in a gas relates to its kelvin temperature Explain the causes and effects of wind chill.	Obtain information from secondary sources to investigate the relationships in astronomical data Analyse the rotations and axes of other planets to predict annual changes
Lesson 2 Learning intentions	**Modelling transport in multi cellular and unicellular organisms** Explain why multicellular organisms need efficient transport systems. Use a knowledge of diffusion to explain how materials enter and leave unicellular organisms. Explain the importance of surface area:volume ratio for organisms.	**Describing rocks** State what rocks are made of Recall why different rocks have different properties Recall some examples of rocks with different textures Explain why certain rocks are porous and/or permeable. Interpret formulae to identify the types of, and ratio of, atoms in a compound	**Transferring energy by radiation** Recall that energy can be transferred by heating by radiation Apply the idea of different colours being good or poor emitters or absorbers Describe how energy is transferred in radiation.	**Magnetic Earth** State what is meant by a magnetic field and recall the shape of the field of a bar magnet Describe the shape of the magnetic field between two bar magnets in different arrangements Describe the effect of the Earth's magnetic field on compass needles Explain how to arrange two magnets so that they attract or repel each other

				Recall the direction of a magnet's magnetic field. Explain how a compass can be used together with maps for navigation. Explain how a plotting compass can be used to show the shape and direction of a magnetic field. Describe the Earth's magnetic field and explain why a magnetic compass needle points north. Use ideas about the Earth's magnetic field to explain variation, dip and deviation
Lesson 3 Learning intentions	**Microscopic Fungi** Recall that some foods, such as bread, beer and wine, are made using yeast. Recall the conditions under which yeast grow quickly. Recall what happens in aerobic and anaerobic respiration in yeast. Recall what happens in fermentation. Recall how yeast can be used to make both alcoholic drinks and bread.	**Igneous Rocks** Recall the names of some igneous rocks Describe the textures and properties of igneous rocks Recall that the Earth consists of a core, mantle and crust Describe how magma can be erupted to form volcanoes Describe how igneous rocks are formed Explain how the size of crystals in igneous rocks is evidence for the speed of cooling and describe some factors that affect this.	**Transferring energy by particles** Recall that energy can be transferred by heating by conduction. Recall that energy can be transferred by heating by convection. Describe how energy is transferred in conduction. Use the particle model of matter to explain energy transfers by conduction Compare the effects of different rates of conduction in different materials.	**Gravity in Space** Recall the direction in which gravity acts. Recall the factors that affect the strength of gravity. State the meaning of gravitational field strength. Recall that planets and natural satellites are kept in orbit by gravity. Explain why the speed of a planet changes as it moves around its orbit.

	Describe how yeast multiply by budding. Describe what is happening in the different parts of a growth curve. Use graphs to calculate population growth rates. Apply microbial growth rates to growth curves of other organisms.	Use crystal size to classify igneous rocks as intrusive and extrusive. Explain the variation in crystal size in an igneous intrusion, in terms of cooling rate. Compare the densities of igneous rocks and relate them to the minerals contained in the rocks	Describe how energy is transferred in convection. Use the particle model of matter to explain energy transfers by convection.	
Lesson 4 Learning intentions	**Protoctist, algae and photosynthesis** Recall the basic functions of common parts of protoctist cells (cell wall, flagella, cilia, pseudopods, cytoplasm, cell membrane, chloroplast, nucleus). Define feeding relationships in terms of energy flow. Describe what happens in photosynthesis. Explain the functions of light and chlorophyll in photosynthesis (in terms of energy transfer). Model photosynthesis using a word equation.	**Weathering & erosion** Recall some examples of physical changes and of chemical changes. Describe the effect of physical and biological weathering on rocks. Explain why rainwater is slightly acidic. Describe the effect of chemical weathering on rocks. Describe how weathering can break up rocks.	**Conductors & insulators** Recall examples of common thermal conductors and insulators. Explain why particular materials are used for given purposes. Compare conduction in thermal conductors and thermal insulators.	**Beyond the Solar System** State the meaning of: Sun, star, galaxy, Universe, constellation Describe the Milky Way State the meaning of: light year. Explain that stars in a constellation only appear to be close to each other Compare the relative sizes and distances of objects in space Describe the different shapes of galaxies and relate the view of the sky to a planet's position in a galaxy Describe some ways in which astronomers can detect planets orbiting stars other than the Sun

Lesson 5 Learning intentions	**Responses of algae to light** Recall the conditions under which algae grow quickly. Prepare slides and observe filamentous and motile algae under a microscope. Explain how changes in a physical environmental factor affect the distribution of organisms Explain how eutrophication occurs and the problems associated with eutrophication in an aquatic environment.	**Erosion & Transportation** Recall how weathered rocks are eroded and explain how fragments get worn down during transport Describe the link between the size of rock fragments carried and the water or wind speed. Compare the fragment sizes that can be transported by wind, water and ice. Compare quantitative data about the effect of speed on the size of grain that can be transported	**Controlling energy transfers by heating** Recall ways of reducing energy transfer by conduction, convection and evaporation. Explain why particular materials are used for given purposes. Evaluate ways of increasing or decreasing energy transfer by conduction, convection, radiation and evaporation. Apply the idea of thermal mass to homes.	
Lesson 6 Learning intentions	**Microorganisms & the carbon cycle** Recall definitions for the terms: ecosystem, decomposer. Recall examples of decomposer microorganisms. Recall the names of the compounds in which carbon is held in an ecosystem. Describe the methods by which carbon is recycled in an ecosystem. Explain the importance of decomposers in an ecosystem.	**Sedimentary Rocks** Recall the names of some sedimentary rocks Describe the textures and properties of sedimentary rocks Describe how sedimentary rocks are formed. Describe how fossils are formed. Describe the link between the size of rock fragments deposited and the water or wind speed. Relate the grain size and roundness to transport history	**(Applicaions of energy transfer) Extended writing)** Identify the process(es) in which energy is transferred by heating in a given situation. Compare conduction, convection, radiation and evaporation as methods of heat energy transfer.	

	Model the recycling of carbon in an ecosystem using the carbon cycle. Make predictions about how changes in physical and biological factors will affect carbon supply in an ecosystem. Explain ways in which decay can be prevented, such as freezing, refrigeration, drying, canning, salting, jamming, pickling and pasteurisation.	Describe features in limestone landscapes and relate them to the way they were formed		
Lesson 7 Learning intentions		**Metals in the Earth** Define the term ore Identify metals which aren't found in ores Describe how metals are extracted from ores Compare extraction against recycling	**Efficiency** Recall what a Sankey diagram tells us. State the meaning of efficiency and recall some advantages of efficient appliances. Recall how to identify useful and wasted energies Match Sankey diagrams to simple situations. Describe whether one machine is more efficient than another. Use Sankey diagrams to compare appliances or processes. Calculate energy efficiencies.	

			Explain why the efficiency can never be greater than 100%.	
Lesson 8 Learning intentions		**Metamorphic rocks & the rock cycle** Recall the names of some metamorphic rocks Describe the textures and properties of metamorphic rocks Describe how metamorphic rocks are formed Use the rock cycle model to link the formation of igneous, sedimentary and metamorphic rocks. Appreciate the different timescales involved in different rock cycle processes, and give examples of fast and slow processes.	**Power & Paying for energy** Describe what power means, and the relationship between watts and joules/second. Recall that electricity and mains gas are charged for on the basis of the energy transferred. Explain why power companies use the kWh as a measure of energy. Recall some advantages of low-energy appliances. Use the formula relating power, energy and time (in W, J and s). Use data to consider cost efficiency by calculating payback times. Evaluate different ways of keeping something warm. Evaluate energy-saving appliances or modifications. Use data to evaluate methods of reducing carbon emissions.	