

	Autumn Term: First Half Term	Autumn Term: Second Half Term	Spring Term: First Half Term	Spring Term: Second Half Term	Summer Term: First Half Term	Summer Term: Second Half Term
Year 5	<u>Baseline assessment of students</u> Forces: Knowledge: Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. Maths and science skills in these topics: - Analysing results - Concluding results - Drawing graphs - Using appropriate measurements Vocabulary: contact, non-contact, friction, air resistance, upthrust, magnetism, balanced, unbalanced, Newton.	Properties of materials Knowledge: Compare and group together everyday materials on the basis of their properties. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible. Maths and science skills in these topics: - Using scientific equipment - Recording results Vocabulary: waterproof, materials, plastic, wood, metal, filtering, evaporating, dissolving, solids, liquids, gases, condensing, melting, solubility, soluble, insoluble. .	Earth and Space Knowledge: Describe the movement of the Earth and other planets relative to the sun in the solar system. Describe the movement of the moon relative to the Earth. Describe the sun, Earth and moon as approximately spherical bodies. Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky Maths and science skills in these topics: - Carrying out an experiment - Identifying variables - Recording results - Using equipment Vocabulary: solar system, Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune, asteroids, comets, meteors, gravity, mass, weight.	Life cycles Knowledge: Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals. Maths and science skills in these topics: - Planning different types of scientific enquiries - Recognising and controlling variables - Taking measurements, using a range of scientific equipment Vocabulary: anther, stigma, pollen, ovule, petal, germination, pollination, fertilisation, amphibian, insect, mammal, pupa, larvae, life cycle.	Investigating the environment Knowledge: Investigate the difference ways in which seeds grow, to compare the life cycles of animals in Leighton buzzard, to describe the impact of the climate on environments, to explain how animals and environments have changed over time. Maths and science skills in these topics: - Planning investigations - Identifying variables - Taking measurements - Recording data - Reporting and representing data Vocabulary: living things, pollination, germination, asexual reproduction, bulbs, tubers, seeds, metamorphosis, ecologist, variable control, microhabitats, invertebrates, biodiversity, mammal, amphibian, insect, and bird	Animals including humans Knowledge: Describe the changes as humans develop to old age. Describe the changes experienced in puberty. Research the gestation periods of other animals and compare them with humans. Maths and science skills in these topics: - Analysing growth charts and data - identifying scientific evidence that has been used to support or refute ideas or arguments - Interpreting growth charts. - Making comparisons. - Graph drawing and analysis. Vocabulary: growth, ageing, puberty, gestation, mammals, hormones, menstruation, average.

Year 6	Electricity Knowledge: Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram. Maths and science skills in these topics: - Planning an experiment. - Taking measurements. - Recording data in tables Vocabulary: Battery, cell, motor, buzzer, wire, series, circuit, conductor, insulator, voltage, current.	Animals including humans Knowledge: Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Describe the ways in which nutrients and water are transported within animals, including humans. Maths and science skills in these topics: - Interpreting line graphs - Using an increased range of measurements. Vocabulary: nutrients, carbohydrates, fat, protein, vitamins, minerals, heart rate, heart, veins, arteries, capillaries, blood, transport, drugs, alcohol, exercise.	Evolution and inheritance Knowledge: Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. Maths and science skills in these topics: Using scientific evidence to support or refute ideas. Vocabulary: inheritance, feature, characteristic, Darwin, Franklin, DNA, offspring, adaptation, fossils, fossilisation, extinction, evolution, species.	Light Knowledge: Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye, ensure diagrams are drawn accurately. Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. Maths and science skills in these topics: - Planning an experiment including variables. - Drawing accurate results tables. Vocabulary: light, transparent, translucent, opaque, reflection, shadows.	Classification Knowledge: Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics. Maths and science skills in these topics: - Using scientific evidence to support or refute ideas. Using scientific keys. - Designing keys. - Species identification. - Investigation planning. - Consideration of variables and accurate/ reliable testing. Vocabulary: vertebrate, invertebrate, mammal, amphibian, fish, bird, reptile, microorganism, bacteria, fungi, viruses, key, identification.	Classroom CSI Knowledge: This KS2 transition unit uses a forensic "Whodunnit" narrative to bridge primary science to the KS3 UK National Curriculum. Students build laboratory skills with Bunsen burners, master variable control, analyse data, and write formal scientific reports preparing them for KS3 chemistry and reactivity. Maths and science skills in these topics: - Accurate measurement - Recording data - Graphing and identifying patterns - Conducting practical enquiries Vocabulary: forensics, chromatography, independent variable, dependent variable, control variable, melting point, irreversible change, reversible change, hypothesis, viscous, Bunsen burner, chimney, air hole, base, tripod, gauze, pipette, conical flask, beaker, title, introduction, method, results, and conclusion
Year 7	Acids and alkalis: Knowledge: Chemical reactions as the rearrangement of atoms. Representing chemical reactions	Cells Knowledge: Cells as the fundamental unit of living organisms, including how to	Electricity Knowledge: Electric current, measured in amperes, in circuits, series and parallel circuits, currents add	Reproduction Knowledge: Reproduction in humans (as an example of a mammal), including the structure and function of the male and female	Sound Knowledge: Frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound. Sound travels as a wave. Sound needs a	Earth and Space Knowledge: Forces as pushes or pulls, arising from the interaction between 2 objects. Using force arrows in diagrams, adding forces in 1

using formulae and using equations. Combustion, thermal decomposition, oxidation and displacement reactions. Defining acids and alkalis in terms of neutralisation reactions. The pH scale for measuring acidity/alkalinity; and indicators. Applying knowledge of acids/alkalis to an investigation. Reactions of acids with metals to produce a salt plus hydrogen. Reactions of acids with alkalis to produce a salt plus water. What catalysts do. Maths and science skills in these topics: • Planning experiments • Identifying variables • Drawing graphs • Interpret observations and data, including identifying patterns and using observations, measurements and data to draw Vocabulary: acid, alkali, pH scale, neutralisation, reactant, product, combustion, oxygen, hydrogen, carbon dioxide, chemical, physical, reaction, reactivity, displacement.	observe, interpret and record cell structure using a light microscope. The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts. The similarities and differences between plant and animal cells. The role of diffusion in the movement of materials in and between cells. The structural adaptations of some unicellular organisms. The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms. Maths and science skills in these topics: • Use appropriate techniques, apparatus, and materials during laboratory work, paying attention to health and safety. • Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility. Vocabulary: cell, tissue, organ, organ system, diffusion, microscope, mitochondria, cell membrane, cell wall, chloroplast, cytoplasm, vacuole, nucleus, ciliated cell, sperm cell, root hair cell, red blood cell, nerve cell.	where branches meet and current as flow of charge. Potential difference, measured in volts, battery and bulb ratings; resistance, measured in ohms, as the ratio of potential difference (p.d.) to current. Differences in resistance between conducting and insulating components (quantitative). Transfer of electrons, forces between charged objects. The idea of electric field, forces acting across the space between objects not in contact. Fuels and energy resources Maths and science skills in these topics: • Use appropriate techniques, apparatus, and materials during laboratory work, paying attention to health and safety. • Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility. Vocabulary: series, parallel, current, voltage, potential difference, circuit, resistance, ohms, amps, volts, ammeter, voltmeter, fossil fuel, renewable, non-renewable.	reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta. Reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative investigation of some dispersal mechanisms. Maths and science skills in these topics: • Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions. • Identify further questions arising from their results. Vocabulary: fertilisation, reproduction, ovaries, oviduct, uterus, cervix, vagina, testes, penis, sperm duct, urethra, sperm, egg, mitochondria, placenta, umbilical cord, gestation, pregnancy, flower, pollen, ovule, anther, stigma,	medium to travel, the speed of sound in air, in water, in solids. Sound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal. The auditory range of humans and animals. Maths and science skills in these topics: • Use appropriate techniques, apparatus, and materials during laboratory work, paying attention to health and safety. • Pay attention to objectivity and concern for accuracy, precision, repeatability and reproducibility. Vocabulary: longitudinal, transverse, frequency, amplification, amplitude Pure and impure substances Knowledge: What a pure and impure substance is and giving examples, describing mixing, dissolving and diffusion by relating these concepts to particle theory. Understand and explain separation techniques, relating to how some substances cannot be easily separated, linking to chemical and physical changes.	dimension, balanced and unbalanced forces. Forces: associated with deforming objects; stretching and squashing – springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water. How to reduce the effect of air and water resistance. Forces measured in newtons, measurements of stretch or compression as force is changed. Force-extension linear relation; Hooke's Law as a special case Non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets, and forces due to static electricity Gravity as a force, gravitational field strength and how it differs on planets and stars. Our sun as a star, other stars in our galaxy, other galaxies. The seasons and the Earth's tilt, day length at different times of year, in different hemispheres. The light year as a unit of astronomical distance. Maths and science skills in these topics: • Apply mathematical concepts and calculate results. • Present observations and data using appropriate methods, including tables and graphs.
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gYear 8	Light Knowledge: The similarities and differences between light waves and waves in matter. Light waves travelling through a vacuum; speed of light. The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface. Use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing; the human eye. Light transferring energy from source to absorber,	Forces Knowledge: Speed and the quantitative relationship between average speed, distance and time (speed = distance ÷ time). The representation of a journey on a distance-time graph. relative motion: trains and cars passing one another. Moment as the turning effect of a force. work done and energy changes on deformation. Working scientifically Maths and science skills in these topics:	Periodic table Knowledge: The varying physical and chemical properties of different elements. The principles underpinning the Mendeleev Periodic Table. The Periodic Table: periods and groups; metals and non-metals including properties of Group 1 metals. The chemical properties of metal and non-metal oxides with respect to acidity. A simple (Dalton) atomic model. Differences between atoms, elements and compounds. Chemical symbols and formulae	Evolution and inheritance Knowledge: Heredity as the process by which genetic information is transmitted from one generation to the next. the role of Watson, Crick, Wilkins and Franklin in the development of the DNA model. differences between species. the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation. the variation between species and	Gas exchange systems Knowledge: The structure and functions of the human gas exchange system, including adaptations to function. The mechanism of breathing to move air in and out of the lungs. Using a pressure model to explain the movement of gases, including simple measurements of lung volume. The impact of exercise, asthma and smoking on the human gas exchange system. The role of leaf stomata in gas exchange in plants. The	Energy Transfers: energy transfers scheme of work explores heat mechanics via conduction, convection, and radiation. Students identify distinct energy stores and utilize mathematical formulas to calculate domestic appliance power consumption and running costs. Working scientifically Maths and science skills in these topics: • Rearranging equations • Unit conversion

	leading to chemical and electrical effects; photosensitive material in the retina and in cameras. Colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection. Maths and science skills in these topics: - Planning experiments - Identifying variables - Scientific observation - Predicting - Explaining casual relationships Vocabulary: light waves, vacuum, transmission, absorption, diffuse scattering, specular reflection, ray model, pinhole camera, refraction, convex lens, concave lens, retina, photo-sensitive material, frequencies, white light, prisms, wavelength, transparent, translucent, opaque, ray diagrams, protractor, angles of reflection, dispersion, filters, and electromagnetic spectrum Food and Digestion The content of a healthy human diet: carbohydrates, lipids (fats and oils), proteins, vitamins, minerals, dietary fibre and water, and why each is needed Calculations of energy	- Using and rearranging equations. - Numeracy skills. - Using correct scientific units. - Graph drawing and graph interpretation. - Investigation planning including variables. - Recording results. Vocabulary: Newtons, motion, units, speed, distance, time, distance-time graph, moment, work.	for elements and compounds. Conservation of mass. Maths and science skills in these topics: - Present observations and data using appropriate methods, including tables and graphs - Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions - Present reasoned explanations, including explaining data in relation to predictions and - hypotheses Vocabulary: The Periodic Table, Mendeleev, period, group, atom, element, compound, proton, neutron, electron, nucleus, acid, alkali, metal, non metal. Polymers, ceramics and composites	between individuals of the same species meaning some organisms compete more successfully, which can drive natural selection. Changes in the environment which may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction. The importance of maintaining biodiversity and the use of gene banks to preserve hereditary material. Maths and science skills in these topics: - Evaluate data, showing awareness of potential sources of random and systematic error - Identify further questions arising from their results. Vocabulary: variation, continuous, discontinuous, environmental, inherited, species, gene, chromosome, DNA, double helix. Polymers, monomers and polymerisation.	process of photosynthesis in plants. Aerobic and anaerobic respiration in living organisms. A word summary for aerobic respiration. The process of anaerobic respiration in humans and micro-organisms. The difference between aerobic and anaerobic respiration in terms of reactants, products formed and implications for the organism. Maths and science skills in these topics: - Present reasoned explanations, including explaining data in relation to predictions and hypotheses - Undertake basic data analysis. - Evaluate data, showing awareness of potential sources of random and systematic error. Vocabulary: mouth, trachea, lungs, bronchi, bronchioles, alveoli, heart, circulation, respiration, aerobic, anaerobic, glucose, oxygen, carbon dioxide, water, lactic acid, fermentation, chloroplast, photosynthesis, gas exchange, diffusion.	- Using apparatus safely - Data evaluation - Using abstract models Vocabulary: conduction, convection, radiation, thermal equilibrium, insulators, conductors, energy stores, kinetic, gravitational potential, chemical, elastic, thermal, power ratings, Watts, Kilowatts, Joules, Celsius, domestic fuel bills, efficiency, and renewable energy Rocks and the atmosphere: Rock cycle Knowledge: The rock cycle and the formation of igneous, sedimentary and metamorphic rocks. Earth as a source of limited resources and the efficacy of recycling. The production of carbon dioxide by human activity and the impact on the environment. Maths and science skills in these topics - Observation skills - Presenting findings - Applying mathematical concepts - Evaluate data - Identifying further questions from results/ findings - Basic data analysis
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	requirements in a healthy daily diet. The consequences of imbalances in the diet, including obesity, starvation and deficiency diseases. The tissues and organs of the human digestive system, including adaptations to function and how the digestive system digests food (enzymes simply as biological catalysts) The importance of bacteria in the human digestive system. Describing polymers and giving examples, such as carbohydrates and proteins. Maths and science skills in these topics: • Measuring angles using protractors (building on from year 5 and 6) • Use and derive simple equations and carry out appropriate calculations • Undertake basic data analysis. Vocabulary: reflection, refraction, diffuse, specular, incidence, retina, cornea, lens, digestion, enzymes, nutrients, villi, oesophagus, intestines, stomach, pancreas, liver, carbohydrate, fat, protein. Polymers, polymerisation.					Vocabulary: Metamorphic, sedimentary, igneous, intrusive, extrusive, magma, cooling, cementation, sediment, rock cycle, erosion, weathering.
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