

## YEAR 7

	Topic	Knowledge & understanding	Key Vocabulary
Autumn	Forces	<ul style="list-style-type: none"> <li>• Contact and non-contact forces</li> <li>• Measuring forces</li> <li>• Representing forces</li> <li>• Balanced and unbalanced forces</li> <li>• Resultant forces</li> <li>• Friction</li> <li>• Energy stores:               <ul style="list-style-type: none"> <li>◦ Kinetic energy</li> <li>◦ Gravitational potential energy</li> <li>◦ Thermal energy</li> <li>◦ Chemical energy</li> <li>◦ Elastic energy</li> </ul> </li> <li>• Conservation of energy</li> <li>• Energy transfers:               <ul style="list-style-type: none"> <li>◦ via a mechanical pathway.</li> <li>◦ via an electrical pathway.</li> <li>◦ via a radiation pathway.</li> <li>◦ via a heating pathway.</li> </ul> </li> </ul>	Factor Exert Contact Non-contact Unit Accurate Represent Rough Irregularity Deformed Surroundings Snapshot Thermal energy store Kinetic energy store Gravitational potential energy store  Mass Weight Normal Upthrust Friction Drag Newton Scale Force arrow Resultant force Unbalanced force Balanced force Friction Microscopic Lubricant Independent variable Control variable Dependent variable
	Solids, liquids and gases	<ul style="list-style-type: none"> <li>• The arrangement and movement of particles in the three states of matter.</li> <li>• Changing state               <ul style="list-style-type: none"> <li>◦ Melting/freezing</li> <li>◦ boiling/condensing</li> </ul> </li> <li>• Evaporation</li> <li>• Pressure</li> <li>• Using Bunsen burners safely</li> </ul>	Arrangement Compress Melting Particle boiling point gradations meniscus evaporation



	<b>Cells</b>	<ul style="list-style-type: none"> <li>Organisms and the seven characteristics of life: <ul style="list-style-type: none"> <li>Movement</li> <li>Respiration</li> <li>Sensitivity</li> <li>Growth</li> <li>Reproduction</li> <li>Excretion</li> <li>Nutrition</li> </ul> </li> <li>Using microscopes and making specimen slides</li> <li>Animal cells and the functions of organelles: <ul style="list-style-type: none"> <li>Cell membrane</li> <li>Cytoplasm</li> <li>Nucleus</li> <li>Mitochondria</li> <li>Ribosomes</li> </ul> </li> <li>Plant cells and the function of organelles <ul style="list-style-type: none"> <li>Cell wall</li> <li>Chloroplasts</li> <li>Vacuole</li> </ul> </li> <li>Specialised cells and their functions: <ul style="list-style-type: none"> <li>muscle cell, fat cell, airway lining cell (ciliated epithelial cell), nerve cell (neurone), red blood cell, egg cell (ovum), sperm cell, leaf (palisade) cell, root hair cell, stoma (two guard cells).</li> </ul> </li> <li>Unicellular organism <ul style="list-style-type: none"> <li>Bacteria (have a cell wall for support and protection, a tail (flagellum) for movement, and loose circular DNA in their cytoplasm that is not held in a nucleus)</li> </ul> </li> <li>Multicellular organisms</li> <li>Diffusion</li> </ul>	Process Movement Sensitivity Growth Function Specialised Uni-prefix Multi-prefix Structure	Organism Respiration Reproduction Excretion Nutrition Microscope Magnify Magnification Specimen Slide Stage Lens Eyepiece lens Objective lens Micrograph Cell Cell membrane Cytoplasm Nucleus Cell wall Vacuole Chloroplast Chlorophyll
	<b>Inheritance and the genome</b>	<ul style="list-style-type: none"> <li>Inheritance and heredity</li> <li>Variation <ul style="list-style-type: none"> <li>Genetic (such as eye colour and blood group)</li> <li>Environmental</li> </ul> </li> <li>The genome <ul style="list-style-type: none"> <li>Nucleus</li> <li>DNA (and it's discovery in 1944)</li> <li>Double helix structure of DNA (and it's discovery in 1953)</li> <li>Chromosomes (DNA is tightly packaged into chromosomes, and that humans have 23 pairs of chromosomes in most of their cells)</li> <li>Genes</li> </ul> </li> </ul>	Inherit Sibling Lifestyle Analogy Model Evaluate Extract Reproduction Offspring Heredity Variation Environment Genetic material Cytoplasm	Nucleus Genetic code DNA Helix Double helix Genome Tissue Pipette Filter (verb) Funnel X-ray Chromosome Gene



Spring	Substances and mixtures	<ul style="list-style-type: none"> <li>Melting and boiling points of pure substances and mixtures</li> <li>Mixtures</li> <li>Brownian motion</li> <li>Diffusion</li> <li>Dissolution               <ul style="list-style-type: none"> <li>Solutions, solvent and solutes</li> <li>Factors affecting solubility</li> </ul> </li> <li>Suspensions</li> </ul>	property conserved observations apparatus command words variable	pure mixture impurity solution soluble solute solvent mass fluid	diffusion dissolve insoluble suspension method independent variable dependent variable solubility
	Sound and light	<ul style="list-style-type: none"> <li>Sound and sound waves               <ul style="list-style-type: none"> <li>Pitch and frequency</li> <li>Amplitude and volume</li> <li>Longitudinal waves and vibrations</li> </ul> </li> <li>Echoes</li> <li>Light waves               <ul style="list-style-type: none"> <li>Transverse waves</li> <li>Representing light waves diagrammatically</li> </ul> </li> <li>Materials and light               <ul style="list-style-type: none"> <li>Transparent</li> <li>Translucent</li> <li>Opaque</li> </ul> </li> <li>Reflection of light               <ul style="list-style-type: none"> <li>Angle of incidence</li> <li>Angle of reflection</li> <li>The normal line</li> </ul> </li> </ul>	Absorb Noise Protractor Incident ray Reflect Echo Pitch Vibrate Amplitude Frequency	Pulse Compression Medium Vacuum Transmit Transparent Translucent Opaque Normal	



	Organs and systems	<ul style="list-style-type: none"> <li>Multicellular organisms, group of cells with the same structure work together to carry out the same job, and that these groups of cells are called tissues <ul style="list-style-type: none"> <li>Muscle</li> <li>bone</li> </ul> </li> <li>Groups of different tissues that work together to perform particular jobs are called organs.</li> <li>An organ system is a group of organs that work together.</li> <li>the skeleton: <ul style="list-style-type: none"> <li>provides support, protection, and movement, and makes blood cells.</li> </ul> </li> <li>Joints: <ul style="list-style-type: none"> <li>Hinge</li> <li>Ball and socket</li> <li>Gliding joints</li> </ul> </li> <li>Bones have specific functions: the skull protects the brain, the ribcage support the vital organs, the pelvis supports the organs and plays an important role in movement, the vertebral column holds the body upright and protects the spinal cord.</li> <li>Bone is a living tissue</li> <li>Bones contain bone marrow, which produces red and white blood cells.</li> <li>Muscles and antagonistic muscle pairs</li> <li>Moment (a turning effect about a pivot) <ul style="list-style-type: none"> <li><math>\text{moment} = \text{force} \times \text{distance from pivot}</math></li> </ul> </li> <li>Smooth muscle, skeletal muscle, cardiac muscle</li> <li>Tendons, ligaments and cartilage</li> <li>The digestive system <ul style="list-style-type: none"> <li>Mechanical and chemical digestion</li> </ul> </li> <li>The functions of: <ul style="list-style-type: none"> <li>The mouth</li> <li>The stomach</li> <li>The small intestines and villi</li> <li>The large intestines</li> </ul> </li> <li>In digestion: <ul style="list-style-type: none"> <li>carbohydrates like starch are broken down into sugars</li> <li>proteins are broken down into amino acids</li> <li>lipids (fats) are broken down into fatty acids and glycerol</li> </ul> </li> <li>enzymes (biological catalysts) <ul style="list-style-type: none"> <li>carbohydrase breaks down carbohydrates</li> <li>lipase breaks down lipids</li> <li>protease breaks down proteins</li> </ul> </li> <li>Food tests (testing for starch and sugars)</li> <li>The role of bacteria in digestion</li> </ul>	System Involuntary Antagonistic Flexible Movement Absorb Absorption Mechanical Competition Force Pivot Digestive system Digestion Gland Adaptation Fibre Bolus Peristalsis	Cell Multicellular Tissue Organ Organ system Organism Bone Skeleton Joint Red blood cell White blood cell Muscle Skeletal muscle Smooth muscle Cardiac muscle Contraction Tendon Cartilage	Ligament Biomechanics Villi Soluble Insoluble Enzyme Reagent Qualitative test Quantitative test Pathogen Bacteria Microorganism Enzyme Flagellum Surface area Diffusion Circulatory system
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Summer	Separating mixtures	<ul style="list-style-type: none"> <li>• Separating mixtures containing insoluble solids</li> <li>• Separating mixtures contain soluble solids</li> <li>• Separation methods (solutions)               <ul style="list-style-type: none"> <li>◦ Filtration</li> <li>◦ Evaporation                   <ul style="list-style-type: none"> <li>▪ Saturated solutions</li> <li>▪ Crystallization</li> </ul> </li> </ul> </li> <li>• Miscible and immiscible liquids and separating techniques               <ul style="list-style-type: none"> <li>◦ Decanting (separating funnel)</li> <li>◦ Distillation</li> <li>◦ Fractional distillation</li> </ul> </li> <li>• Paper chromatography</li> </ul>	<div>           Filtrate Residue Distillate Decant Insoluble Dissolve Dense Solute Solvent Evaporation         </div> <div>           Solution Immiscible Miscible Distillation Delivery tube Boiling point Chromatography Chromatogram         </div>
	Earth in Space	<ul style="list-style-type: none"> <li>• The Earth, moon and sun               <ul style="list-style-type: none"> <li>◦ Orbits and rotations</li> </ul> </li> <li>• Leap years</li> <li>• Seasons (the Earth's axis)</li> <li>• Phases of the moon</li> <li>• The solar system               <ul style="list-style-type: none"> <li>◦ Planets</li> </ul> </li> <li>• Stars (including the sun)               <ul style="list-style-type: none"> <li>◦ Light years</li> </ul> </li> <li>• Asteroids</li> <li>• Gravity</li> <li>• The Milky way (galaxy)</li> <li>• The Universe               <ul style="list-style-type: none"> <li>◦ The geocentric model of the universe</li> <li>◦ The heliocentric model of the Solar System</li> </ul> </li> <li>• Telescopes</li> </ul>	<div>           Attract Repel Billion Axis Orbit Nuclear fusion reaction Dwarf planet Asteroid Light year         </div> <div>           Galaxy Universe Light ray Heating Climate Hemisphere Geocentric Heliocentric         </div>



	Classification and variation	<ul style="list-style-type: none"> <li>• Classification of living organisms <ul style="list-style-type: none"> <li>◦ Kingdoms to species</li> <li>◦ Animal kingdom</li> <li>◦ Plant kingdom</li> <li>◦ Fungus kingdom</li> <li>◦ Bacterial kingdom</li> </ul> </li> <li>• Binomial naming</li> <li>• Biodiversity</li> <li>• Sampling techniques <ul style="list-style-type: none"> <li>◦ pooters, sweep nets, pitfall traps and quadrats</li> </ul> </li> <li>• Genetic variation</li> <li>• Environmental variation</li> <li>• Continuous and discontinuous variation</li> <li>• Bar charts and histograms</li> <li>• <b>Know that</b> classification involves using the similarities and differences in organisms' features to classify them into groups.</li> </ul>	Distribution Population Sample Estimate Inherit Lifestyle Environment Value Bias Quadrat Classification Kingdom Genus Species Binomial name Taxonomy	Classification key Animal (kingdom definition) Bacterium (kingdom definition) Plant (kingdom definition) Fungus (kingdom definition) Biodiversity Reproduction DNA Variation Family resemblance Species Gene Genetic Continuous variation Discontinuous variation Bar chart Histogram Line graph :
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