

Year 7 Science Autumn Term

BIOLOGY – Cells and organisation

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
<p>Cells as the fundamental unit of living organisms, including how to observe, interpret and record cell structure using a light microscope</p>	<p>Observe prepared slide through a microscope. Draw findings. Match correct labels to parts of the microscope</p>	<p>Observe prepared slide through a microscope. Correctly set up microscope. Draw findings. Match correct labels to parts of the microscope</p>	<p>Observe prepared slide through a microscope. Correctly set up microscope. Draw findings. Labels to parts of the microscope</p>	<p>Prepare onion slide for observation; Correctly set up microscope. Draw findings. Identify and label parts of the cell; Label diagram with magnification Labels parts of the microscope.</p>	<p>Independently prepare onion slide for observation; Correctly set up microscope; Draw finding; Identify and label parts of the cell; Label diagram with magnification; Labels parts of the microscope</p>
<p>The functions of the cell wall, cell membrane, cytoplasm, nucleus, vacuole, mitochondria and chloroplasts</p>	<p>Match key cell structures (cell wall, membrane, cytoplasm, nucleus) to their functions</p>	<p>Match all cell structures to their functions</p>	<p>Label cell structures and state their functions</p>	<p>Identify cell structures and describe their functions</p>	<p>Identify all cell structures and describe their functions</p>

The similarities and differences between plant and animal cells	Identify three similarities between plant and animal cells	Identify three similarities between plant and animal cells Identify three differences between plant and animal cells	Describe three similarities between plant and animal cells	Explain three similarities and differences between plant and animal cells	Explain the similarities and differences between plant and animal cells
The hierarchical organisation of multicellular organisms: from cells to tissues to organs to systems to organisms	Order the structures in a hierarchical organisation using pictures to support	Correctly link the structures in a hierarchical organisation using a specific example	Describe the hierarchical organisation of the multicellular organism	Explain the hierarchical organisation of the multicellular organism and use a specific example	Explain the hierarchical organisation of the multicellular organism and use specific examples
The role of diffusion in the movement of material in and between cells	Observe diffusion using a model. Order the stages correctly.	Identify the different stages of diffusion. Define diffusion in simple terms	Describe the different stages of diffusion. Define diffusion as the movement of particles	Explain diffusion using the different stages to support the explanation	Explain diffusion in comparison to other transport pathways
The structural adaptations of some unicellular organisms		Identify all adapted features of a unicellular organism and make some links to the purpose	Describe the adaptation of a unicellular organism	Explain the adaptations of given unicellular organisms	Explain the adaptations of the unicellular organisms and give reasons why.

CHEMISTRY - Atoms, elements and compounds

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
A simple (Dalton) atomic model	Match labels to an atomic model	Label a diagram of an atom	Draw and label an atomic model	Draw, label and compare the atomic model to the plum pudding model	Draw, label, compare and describe the atomic model to the plum pudding model
Differences between atoms, elements and compounds	Highlight one difference between models of atoms, elements and compounds	Identify one difference between an atom, an element and a compound	Identify the differences between atoms, elements and compounds from examples given	Describe the differences between atoms, elements and compounds	Explain the differences between atoms, elements and compounds
Chemical symbols and formulae for elements and compounds	Recall 5 common elements chemical symbols in the Periodic Table; Recall the chemical formula for water	Recall the first 5 chemical symbols of the Periodic Table; Recall two common compounds chemical formulae	Recall the first 10 chemical symbols of the Periodic Table; Recall common compound chemical formulae	Recall the first 10 chemical symbols of the Periodic Table; Recall common compound chemical formulae within chemical equations	Recall the first 10 chemicals and their symbols of the Periodic Table; Recall two common compound chemical formulae within chemical equations

PHYSICS - Forces

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Forces as pushes or pulls, arising from the interaction between two objects	Recognise a pull force and a push force between two objects	Identify the pull force and a push force between two objects in different circumstances eg door opening, moving a trolley	Label the pull force and a push force between two objects and identify them as contact forces	Describe the pull force and a push force between two objects as contact forces and how they work	Explain the pull and push force between two objects as contact forces and how they work
Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces	Correctly identify the direction of the force; Correctly identify the larger force;	Correctly identify and draw the direction of the force; Correctly identify and draw the larger force;	Describe the link between the force arrows and the size of the force; Correctly identify when forces are balanced	Describe the link between the force arrows and the size of the force and draw given examples; Describe the difference in the diagrams when forces are balanced/unbalanced and the outcome of the forces.	Explain the link between the force arrows and the size of the force and draw given examples; Explain the difference in the diagrams when forces are balanced/unbalanced and the outcome of the forces.
Moment as the turning effect of a force	Identify the direction of the turning force	Correctly label the direction of the turning force	Describe the turning force and its uses	Explain how the turning force is used effectively in different examples	Explain how a turning force can be used in two specific examples

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	Sort given examples into other types of contact forces eg friction, squash/stretch, air resistance.	Identify examples of other types of contact forces eg friction, squash/stretch, air resistance.	Describe other types of contact forces and give examples eg friction, squash/stretch, air resistance.	Explain other types of contact forces and give worked examples eg friction, squash/stretch, air resistance.	Explain contact forces and give specific examples
Forces measured in Newtons, measurements of stretch or compression as force is changed	Recognise Newtons as the measurement of force and its symbol N	Begin to use Newtons when directed to the answer being a force	Consistently use Newtons as a unit.	Identify measurements where Newtons would be the unit required (identifying the answer as a force)	Describe where Newtons would be used as the unit.
Force-extension linear relation; Hooke's Law as a special case	Recognise that there is a relationship between force and extension.	Correctly identify the relationship in Hooke's Law	Describe the relationship between force and extension using the example of Hooke's Law	Explain Hooke's Law in relation to force and extension	Investigate Hooke's Law in relation to force and extension

<p>Non-contact forces: gravity forces acting at a distance on Earth and in space, forces between magnets and forces due to static electricity</p>	<p>Sort forces into contact or non-contact examples</p>	<p>Identify two examples of contact forces</p>	<p>Describe the differences between contact and non-contact forces</p>	<p>Explain the differences, with examples, of contact and non-contact forces</p>	<p>Explain the differences and any similarities between contact and non-contact forces</p>
<p>Opposing forces and equilibrium: weight held by stretched spring or supported on a compressed surface</p>	<p>Using forces diagrams identify when a force is balanced</p>	<p>Identify balanced forces and draw the correct force diagram.</p>	<p>Describe how we know if forces are balanced</p>	<p>Explain when forces are balanced</p>	<p>Explain when forces are balanced and how this relates to Newton's Law.</p>

Year 7 Science Spring Term

BIOLOGY - The skeletal and muscular system

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
The structure and function of the human skeleton, to include support, protection, movement and making blood cells	Identify key parts of the skeleton (rib cage, pelvis, back bone/spine. Skull) and their main function	Identify key parts of the skeleton (rib cage, pelvis, back bone/spine. Skull) and their functions	Label the human skeleton and describe the functions of the key parts	Label the human skeleton and explain the functions	Label the human skeleton and explain the functions; Compare to other skeletons and name large bones
Biomechanics – the interaction between skeleton and muscles, including the measurement of force exerted by different muscles	Identify main muscle areas on a diagram. Observe the different forces exerted by different muscles	Identify specific muscles on a diagram. Investigate, with support, the different forces exerted by different muscles	Describe the need of muscles in the body, with example. Investigate the different forces exerted by different muscles	Explain the purpose of muscles in the body and investigate the different forces exerted by the main muscles	Explain and identify the main muscle groups in the body and investigate the differences in force exerted.
The function of muscles and examples of antagonistic muscles	Identify pairs of muscles and observe how they work	Identify pairs of muscles and the force exerted to move particular bones (eg bicep/tricep)	Describe the relationship between pairs of muscles as antagonistic	Explain the relationship between antagonistic muscles	Explain the relationship between antagonistic muscles and then describe the difficulty if there were no pairs.

CHEMISTRY - The Particulate nature of matter

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure	Match the properties with solids, liquids and gases	List two properties for solids, liquids and gases	List the properties of solids, liquids and gases	Describe the properties of solids, liquids and gases.	Explain the properties of solids, liquids and gases using particles and energy levels in the explanation
Changes of state in terms of particle model	Correctly label the changes of state diagram, with support	Correctly order the changes of state from solid through to gas and back.	With support, describe the changes of state in terms of particle energy	Describe the changes of state in relation to the energy of the particles	Explain what happens to the particles during the changes of state

PHYSICS - Observed waves

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Waves on water as undulation which travel through water with transverse motion; these waves can be reflected, and	Sort the properties of waves into longitudinal and transverse.	Match the properties of longitudinal and transverse waves	Describe, with support, the properties of longitudinal and transverse waves	Describe the properties of longitudinal and transverse waves	Explain the properties of longitudinal and transverse waves

add or cancel – superposition					
The similarities and differences between light waves and waves in matter	Sort the similarities and differences between light waves and other waves	Identify the similarities and differences between light waves and other waves	Describe the similarities and differences between light waves and other waves	Explain, with support, the similarities and differences between light waves and other waves	Explain the similarities and differences between light waves and other waves
The transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface	Observe the behaviour of light waves through different types of material	Begin to investigate the behaviour of light waves through different types of material	Investigate, with support, the behaviour of light waves through different types of materials	Investigate the behaviour of light waves through different types of materials	Plan and investigate the behaviour of light waves through different types of materials

Year 7 Science Summer Term

BIOLOGY - Reproduction

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
<p>Reproduction in humans (as an example of a mammal), including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus</p>	<p>Identify key parts of the reproductive system of mammals and their main function;</p> <p>Label the key dates in the menstrual cycle;</p> <p>Organise the key sequences of pregnancy;</p> <p>Identify a good lifestyle choice for an expectant mother.</p>	<p>Identify parts of the reproductive system of mammals and their main function;</p> <p>Label the key dates in the menstrual cycle;</p> <p>Organise the key sequences of pregnancy;</p> <p>Identify a good lifestyle choice and a poor lifestyle choice for an expectant mother</p>	<p>Identify key parts of the reproductive system of mammals and describe their main function;</p> <p>Describe the key dates in the menstrual cycle;</p> <p>Describe the key sequences of pregnancy;</p> <p>Identify, with reasons, a good lifestyle choice for an expectant mother</p>	<p>Identify key parts of the reproductive system of mammals and describe their main function;</p> <p>Explain the key dates in the menstrual cycle;</p> <p>Describe the key sequences of pregnancy;</p> <p>Explain a good lifestyle choice and a poor lifestyle choice for an expectant mother</p>	<p>Identify parts of the reproductive system of mammals and described their function;</p> <p>Explain the dates in the menstrual cycle;</p> <p>Describe the sequences of pregnancy;</p> <p>Explain lifestyle choices for expectant mothers and how they will impact on the unborn foetus</p>

through the placenta.					
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CHEMISTRY - The Periodic Table

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
The varying physical and chemical properties of different elements	Sort, with support, element cards based on information given	Sort element cards based on the information given	Organise the element cards into appropriate groups and give one reason	Describe three chemical and physical properties for Group 1 and Group 7 elements	Explain three chemical and physical properties for Group 1 and Group 7 elements
The Periodic table: periods and groups; metals and non-metals	Sort out metals and non-metals in the Periodic Table. Label periods and groups	Identify the position of metals and non-metals in the Periodic Table. Identify periods and groups for given elements	Organise the Periodic Table into the main groups: 1, Transition metals, non-metals and 0 Identify periods, groups and mass number for elements	Label the Periodic Table including periods/groups/metals/non-metals	Label the Periodic Table including periods/groups/metals/non-metals and give a simple explanation of the order.

How patterns in reactions can be predicted with reference to the Periodic Table	Observe patterns for elements and begin to make predictions	Predict the patterns to reactions for the groups	Describe the pattern of reactions in Group 1 and 0	Compare the pattern of reaction for Group 1 and Group 7 elements	Compare and explain the pattern of reaction for Group 1 and Group 7 elements
The properties of metals and non-metals	Sort materials into metals and non-metals with a reason	Identify two properties for metals	Describe two differences in metals and non-metals	Describe properties of metals and non-metals	Explain the properties of metals and non-metals

PHYSICS – Pressure in fluids

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Atmospheric pressure, decreases with increase of height as weight of air above decreases with height					
Pressure in liquids, increasing with depth; upthrust	Predict whether an object will sink or float	Predict and give reasons as to whether an	Describe whether an object will sink or float, using	Explain, with support, why an object sinks or	Explain why an object sinks or floats, dependant

effects, floating and sinking		object will sink or float	weight and upthrust	floats, dependent on weight and upthrust	on weight and upthrust
Pressure measured by ratio of force over area – acting normal to any surface	With support, compare the differences in pressure of specific examples	Compare the differences in pressure of specific examples	Describe, using specific examples, the differences in pressure dependant on area of force applied	With support, explain, using specific examples, the differences in pressure dependant on area of force applied	Explain, using specific examples, the differences in pressure dependant on area of force applied.

Changes in systems

National Curriculum	Launch	Breakthrough	Foundation	Developing	Intermediate
Energy as a quantity that can be quantified and calculated; the total energy has the same value before and after a change	With support, identify that energy quantities remain the same before and after any changes.	Identify that energy quantities remain the same before and after any changes.	With support, use calculations to show that energy quantities remain the same before and after any changes.	Use calculations to show that energy quantities remain the same before and after any changes.	Use calculations to describe that energy quantities remain the same before and after any changes.
Comparing that starting with the final conditions of a system and describing	With support, identify the different parts of a Sankey diagram, i.e.	Identify the different parts of a Sankey diagram, i.e. starting energy,	With support, complete the different parts of a Sankey diagram i.e.	Complete the different parts of a Sankey diagram i.e. starting energy,	Calculate the values and complete the different parts of a Sankey

<p>increases and decreases in the amounts of energy associated with movements, temperatures, changes in positions in a field, in elastic distortions and in chemical compositions.</p>	<p>starting energy, final energy, energy changes, different sized arrows representing different quantities of energy</p>	<p>final energy, energy changes, different sized arrows representing different quantities of energy</p>	<p>starting energy, final energy, energy changes, different sized arrows representing different quantities of energy</p>	<p>final energy, energy changes, different sized arrows representing different quantities of energy; using given values</p>	<p>diagram i.e. starting energy, final energy, energy changes, different sized arrows representing different quantities of energy.</p>
<p>Using physical processes and mechanisms, rather than energy, to explain the intermediate steps that bring about such changes.</p>	<p>With support identify real life processes and their energy changes</p>	<p>Identify real life processes and their energy changes</p>	<p>With support describe real life processes and their energy changes</p>	<p>Describe real life processes and their energy changes</p>	<p>Explain real life processes and their energy changes.</p>