YEAR 5 SCIENCE

Working Scientifically

Pupils will be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurement using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments

EARTH AND SPACE

Working Scientifically Assessment Task - Changing Ideas

Key Vocabulary

axis, Earth, geocentric, heliocentric, Jupiter, Mars, Mercury, Moon, orbit, planets, rotates, Saturn, solar system, sphere / spherical, star, Venus, Neptune, Uranus, Sun

Working Scientifically Skills	Knowledge
Planning ➢ use scientific experiences to explore ideas and raise different types of	**National Curriculum Requirements** ➢ describe the movement of the Earth relative to the Sun in the solar system ➢ describe the movement of the Moon relative to the Earth ➢ describe the Sun, Moon and Earth as approximately spherical bodies

questions ➢ talk about how scientific ideas have developed over time **Obtaining and presenting evidence** ➢ recognise which secondary source will be most useful to research ideas ➢ begin to separate opinion from fact **Considering and evaluating evidence** ➢ identify scientific evidence that has been used to support or refute ideas or arguments ➢ use relevant scientific language and illustrations to discuss, communicate and justify scientific ideas	➢ use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky **Lesson Breakdown** **The Solar System** ➢ the Solar System is a group of eight planets orbiting a star, the Sun ➢ know the names of the planets in the Solar System ➢ gain an awareness of the scale of the Solar System and the differences between its planets ➢ understand that Earth is the only planet that can sustain life **Sun and Earth:** ➢ the Sun is the centre of the Solar System and does not move ➢ the Earth orbits the Sun and takes 365 ¼ days (one year) to complete a rotation ➢ the Earth spins of its own axis and takes 24 hours (one day) to complete a rotation ➢ the Earth's spin creates day and night ➢ the Sun appears to to move through the sky from east to west ➢ the purpose of a leap year **Spherical Bodies:** understand why people used to believe the Earth was flat and how that idea changed to the idea that Sun, Earth and Moon are approximately spherical **The Moon:** ➢ the Moon orbits the Earth and takes approximately 28 days to complete one rotation ➢ the moon passes through different phases ➢ the pull of gravity from the Moon and Sun causes tides on Earth **The Seasons:** ➢ the Earth's tilt on its axis causes the seasons ➢ the Earth's tilt means that the poles are angles towards or away from the Sun

<table>
<tr><td></td><td>at different times of the year
➢ at the equator, the Sun is directly overhead for most of the year
Geocentric versus Heliocentric:
➢ years ago people believed that the planets moved around the Earth (Geocentric model)
➢ the work and ideas of many astronomers e.g Copernicus, Kepler and Galileo combined over many years to move to a Heliocentric model</td></tr>
<tr><td colspan="2">LIVING THINGS AND THEIR HABITATS
Working Scientifically Assessment Task – Gestation Length</td></tr>
<tr><td colspan="2">Key Vocabulary
asexual, cuttings, egg, fertilises, gestation, life cycle, live young, metamorphosis, pollination, reproduce / reproduction, runners, sexual, sperm</td></tr>
<tr><td>Working Scientifically Skills</td><td>Knowledge</td></tr>
<tr><td>Obtaining and presenting evidence
➢ recognise which secondary sources will be most useful to research ideas
➢ record and present findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
➢ report on findings from enquiries, using relevant scientific language and</td><td>National Curriculum
➢ explain 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
Lesson Breakdown
Making New Plants 1
➢ describe the life process of reproduction in some plants and animals by exploring sexual reproduction in plants
Making New Plants 2</td></tr>
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<td>conventions, in oral and written explanations such as displays and other presentations
Considering and evaluating evidence
➢ identify patterns that might be found in the natural environment
➢ use results to identify when further tests and observations might be needed</td>
<td>➢ describe the life process of reproduction in some plants and animals by exploring sexual reproduction in plants
Mammals
➢ describe the life cycle of a mammal by exploring the life cycles of mammals in different habitats
Jane Goodall
➢ explore Jane Goodall's work with chimpanzees
Metamorphosis
➢ describe the differences in the life cycles of an amphibian and an insect by exploring complete and incomplete metamorphosis
Comparing Life Cycles
➢ compare the life cycles of plants, mammals, amphibians, insects and birds</td>
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<td colspan="2">FORCES
Working Scientifically Assessment Task - Parachutes</td>
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<td colspan="2">Key Vocabulary
air resistance, buoyancy, force, friction, gears, gravity, levers, mass, mechanisms, pulleys, streamlined, upthrust, water resistance, weight</td>
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<tr>
<td>Working Scientifically Skills</td>
<td>Knowledge</td>
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<tr>
<td>Planning</td>
<td>National Curriculum</td>
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➢ plan different types of scientific enquiries to answer questions ➢ recognise and control variables where necessary **Obtaining and presenting evidence** ➢ take measurements ➢ take repeat readings ➢ record data and results of increasing complexity ➢ record and present findings using scientific diagrams and labels classification keys, tables, scatter graphs, bar and line graphs ➢ Report on findings from enquiries, using relevant scientific language and conventions, in oral and written explanations such as displays and other **Considering and evaluating evidence**	➢ 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 **Lesson Breakdown** **Forces** ➢ 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 by identifying forces acting on objects **Gravity** ➢ explore the effect gravity has on objects **Air Resistance** ➢ identify the effects of air resistance **Water Resistance** ➢ identify the effects of water resistance **Friction** ➢ identify the effects of friction

➢ identify conclusions, causal relationships and explanation of results (including the degree of trust) ➢ identifies scientific evidence that has been used to support or refute ideas or arguments ➢ use test results to make predictions and set up further comparative fair tests	**Mechanisms** ➢ recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect
ANIMALS (Including Humans) **Working Scientifically Assessment Task – Growth**	
Key Vocabulary adolescence, adulthood, asexual reproduction, fertilisation, gestation, life cycle, life expectancy, menstruation, prenatal, puberty, reproduce, sexual reproduction	
Key Skills	**Knowledge**
Planning ➢ plan different types of scientific enquiries to answer questions	**National Curriculum** ➢ describe the changes as humans develop from birth to old age **Lesson Breakdown**

➢ recognise and control variables where necessary **Obtaining and presenting evidence** ➢ take measurements ➢ take repeat readings ➢ record data and results of increasing complexity ➢ record and present findings using scientific diagrams and labels classification keys, tables, scatter graphs, bar and line graphs ➢ Report on findings from enquiries, using relevant scientific language and conventions, in oral and written explanations such as displays and other **Considering and evaluating evidence**	**Human Timeline** ➢ describe the stages of human development **Growth of Babies** ➢ explain how babies grow and develop **Puberty** ➢ describe and explain the main changes that occur during puberty **Changes in Old Age** ➢ identify the changes that take place in old age

➢ identify patterns that might be found in the natural environment ➢ use results to identify when further tests and observations might be needed	

PROPERTIES OF MATERIALS

Working Scientifically Assessment Task – Dissolving Skittles

Key Vocabulary

burning, change of state, condensing, dissolve, evaporating, filter, freezing, gases, insoluble, liquids, melting, mixture, new material, reversible/non-reversible change, rusting, sieve, solids, soluble, solution, thermal/electrical insulator/conductor, transparency

Key Skills	Knowledge
Planning ➢ plan different types of scientific enquiries to answer questions ➢ recognise and control variables where necessary **Obtaining and presenting evidence**	**National Curriculum** ➢ compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, transparency, conductivity (electrical and thermal), and responses to magnets ➢ understand 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, including through filtering, sieving and evaporating

➢ record and present findings using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs ➢ report on findings from enquiries **Considering and evaluating evidence** ➢ draw valid conclusions, explain and interpret the results (including degree of trust) ➢ use test results to make predictions and set up further comparative fair tests	➢ give reasons, based on evidence from comparative and fair tests for the particular uses of everyday materials, including metals, wood and plastic 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, including changes associated with burning and the action of acid on bicarbonate of soda **Lesson Breakdown** **Properties of Materials** ➢ compare and group together everyday materials on the basis of their properties, including their hardness,transparency and response to magnets by sorting and classifying materials according to their properties **Keeping Cool** ➢ compare and group together everyday materials on the basis of their thermal conductivity by investigating thermal conductors and insulators **Brighter Bulbs** ➢ compare and group together everyday materials on the basis of their electrical conductivity by investigating the best electrical conductors **Disappearing or Dissolving?** ➢ compare and group together everyday materials on the basis of their solubility by investigating dissolving **Separating Mixtures**

	➢ demonstrate that dissolving, mixing and changes of state are reversible changes by separating different mixtures **Irreversible Changes** ➢ identify and explain irreversible chemical changes