Year 5 Scheme of Learning: Science

Year 5 – Autumn 1 – Living Things & Their Habitats

Lesson 1	
Learning Objective	**To identify the parts of a plant used for reproduction.**
Declarative Knowledge	- Plants reproduce sexually. - Sexual reproduction occurs through pollination, usually involving wind or insects. - Anthers are male parts that produce pollen, ovaries are female parts that fuse with pollen.
Procedural Knowledge	Identify and classify.
Key Vocabulary	Life cycle, reproduction, fertilise, pollen, ovary, anther, petal, ovules.

Lesson 2	
Learning Objective	**To observe how plants can reproduce asexually.**
Declarative Knowledge	- Plants reproduce both sexually and asexually. - Bulbs, tubers, runners and plantlets are examples of asexual plant reproduction which involves only one parent. - Gardeners may force plants to reproduce asexually by taking cuttings.
Procedural Knowledge	Observing and measuring.
Key Vocabulary	Life cycle, reproduction, fertilise, cuttings, bulbs, runners, plantlets, tubers.

Lesson 3	
Learning Objective	**To explain the life cycle of a range of mammals.**
Declarative Knowledge	- Mammals reproduce using sexual reproduction. - Sexual reproduction involves two parents where the sperm from the male fertilises the female egg. The fertilised egg is an embryo. - Animals including humans have offspring which grow into adults. - In humans and some animals these offspring will be born live, such as babies or kittens, and then grow into adults.
Procedural Knowledge	Identifying and classifying.
Key Vocabulary	Life cycle, reproduction, fertilise, mammal, live young, young, adolescent, adult, embryo

Lesson 4	
Learning Objective	**To describe the life cycle of amphibians.**
Declarative Knowledge	- In amphibians, eggs are laid that hatch to young which then grow to adults. - Young frogs are called tadpoles. Eventually these grow legs and become adult frogs. - This is called a metamorphosis – when an animal changes as it develops.
Procedural Knowledge	Interpreting and communicating.
Key Vocabulary	Life cycle, reproduction, fertilise, eggs, tadpole, frog, metamorphosis.

Lesson 5	
Learning Objective	**To understand the life cycle of insects (metamorphosis).**
Declarative Knowledge	- Young insects undergo a further change before becoming adults e.g. caterpillars to butterflies. - Active young insects are called larvae. Inactive young insects are called pupae. - For butterflies, the larva stage is called 'caterpillar' and the pupa stage is called 'chrysalis.' - While in the chrysalis, the caterpillar transforms into a butterfly.
Procedural Knowledge	Interpreting and communicating.
Key Vocabulary	Life cycle, reproduction, fertilise, eggs, larva, pupa, adult, caterpillar, chrysalis.

Lesson 6	
Learning Objective	**To identify patterns between an animal's size and their lifespan.**
Declarative Knowledge	- A gestation period is how long a baby develops within the mother's body. - Life expectancy means the average amount of time that a particular species survives. - There is no correlation between an animal's gestation period and their life expectancy.
Procedural Knowledge	Recording data.
Key Vocabulary	Gestation period, life expectancy, datasets, line graph, bar chart, comparison.

Year 5 – Autumn 2 – Animals inc. Humans

Lesson 1	
Learning Objective	**To identify and describe the stages of a baby's development.**
Declarative Knowledge	- Humans reproduce using sexual reproduction – sperm and eggs fuse to create an embryo. - The gestation period for humans is 40 weeks. - The child develops within the mother's body during this time – this is called the prenatal period. - Between the ages of 0 and 1, babies develop rapidly and become more independent. - When they learn to walk, children are called 'toddlers.'
Procedural Knowledge	Interpreting and communicating.
Key Vocabulary	Reproduction, prenatal, infant, toddler, child, development.

Lesson 2	
Learning Objective	**To make comparisons between age and height.**
Declarative Knowledge	- Infants grow in height at a rapid rate between 0 and 1. - Year 5 age children grow at varying rates, but much slower than infants. - Children who are taller are not necessarily older.
Procedural Knowledge	Interpreting data.
Key Vocabulary	Datasets, comparison, analyse, height, growth, infant.

Lesson 3	
Learning Objective	**To understand bodily changes that happen during adolescence.**
Declarative Knowledge	- During puberty, a child's body changes and develops primary and secondary sexual characteristics. - This enables the adult to reproduce.
Procedural Knowledge	Direct instruction.
Key Vocabulary	Puberty, development, sexual, changes.

Lesson 4	
Learning Objective	**To identify changes that occur during old age.**
Declarative Knowledge	- Old age is the final stage of development for humans. - Older people go through a range of changes (e.g. teeth, eyesight, mobility) but this is different for each person. - Older people can prevent or delay these changes through positive lifestyle.
Procedural Knowledge	Identifying and classifying.
Key Vocabulary	Adult, old age, development, lifestyle.

Lesson 5	
Learning Objective	**To consider the impact of living longer.**
Declarative Knowledge	- People are living much longer now than in the past (the life expectancy has increased). - There are many environmental reasons for this. - People living longer is having an impact on society, the economy and the environment.
Procedural Knowledge	Interpreting and communicating.
Key Vocabulary	Life expectancy, environment, society, impact.

Year 5 – Spring 1 – Earth and Space

Lesson 1	
Learning Objective	**Describing the Sun, Earth and Moon as approximately spherical bodies.**
Declarative Knowledge	- The Sun is a star and the Earth is a planet. - Earth, Sun and Moon are approximately spherical.
Procedural Knowledge	Communicating ideas.
Key Vocabulary	Earth, moon, sun, planet, star, spherical.

Lesson 2	
Learning Objective	**Know the order of the planets and how they move in the solar system.**
Declarative Knowledge	- There are 8 planets that travel around the sun in fixed orbits. - I know the 8 planets' names in order of distance from the Sun.
Procedural Knowledge	Identifying and classifying.
Key Vocabulary	**All planet names,** orbit, rotation, diameter.

Lesson 3	
Learning Objective	**To examine the geocentric and heliocentric theories.**
Declarative Knowledge	- The Earth and other planets in the solar system orbit around the Sun (heliocentric orbit). - In the past, people believed that the Sun and other planets orbited around the Earth (geocentric).
Procedural Knowledge	Secondary sources.
Key Vocabulary	Geocentric, heliocentric, orbit, Copernicus, Galileo.

Lesson 4	
Learning Objective	**To explain why the sun appears to move and the arguments for the Earth's rotation.**
Declarative Knowledge	- Earth takes 365¼ days to complete its orbit around the Sun. - The Earth rotates (spins) on its axis every 24 hours. - As the Earth rotates the Sun appears to move across the sky.
Procedural Knowledge	Communicating ideas.
Key Vocabulary	East, west, highest point, rotating, axis.

Lesson 5	
Learning Objective	**To predict night and day in different places on Earth.**
Declarative Knowledge	- As Earth rotates half faces the Sun (here it is day) and half is facing away from the Sun (night). - When the hemisphere is facing the Sun, it is daytime. - When the hemisphere is facing away (in shadow), it is night time.
Procedural Knowledge	Making predictions.
Key Vocabulary	Day, night, anticlockwise, rotation, hemisphere, shadow.

Lesson 6	
Learning Objective	**To explain how the Moon orbits the Earth.**
Declarative Knowledge	- The Moon orbits the Earth. - It takes about 28 days to complete its orbit.
Procedural Knowledge	Communicating ideas.
Key Vocabulary	Moon, orbit.

Year 5 – Spring 2 – Forces

Lesson 1	
Learning Objective	**To identify forces acting on objects.**
Declarative Knowledge	- A force causes an object to start moving, stop moving, speed up, slow down or change direction. - Examples include pushing and pulling.
Procedural Knowledge	Identifying and classifying.
Key Vocabulary	Force, gravity, push, pull.

Lesson 2	
Learning Objective	**To measure the force of gravity pulling on objects.**
Declarative Knowledge	- Gravity is a force that acts at a distance. - Everything is pulled to the Earth by gravity. - This causes unsupported objects to fall.
Procedural Knowledge	Measuring and observing.
Key Vocabulary	Gravity, force, Earth, Isaac Newton.

Lesson 3	
Learning Objective	**To measure and record the effects of air resistance.**
Declarative Knowledge	- Air resistance is a contact forces that acts between moving surfaces. - The object may be moving through the air and air may be moving over a stationary object. - Different shapes and weights of objects are affected by air resistance differently. - To give examples of when it is beneficial to have air resistance.
Procedural Knowledge	Recording data.
Key Vocabulary	Air resistance, surface area, gravity.

Lesson 4	
Learning Objective	**To identify the effects of water resistance.**
Declarative Knowledge	- Air resistance is a contact force that acts between moving surfaces. - The object may be moving through the water and water may be moving over a stationary object. - To give examples of when it is beneficial to have water resistance.
Procedural Knowledge	Identifying and classifying.
Key Vocabulary	Water resistance, particles.

Lesson 5	
Learning Objective	**To make predictions about the effects of friction.**
Declarative Knowledge	- To give examples of when it is beneficial to have friction. - Friction is a contact force that acts between moving surfaces.
Procedural Knowledge	Making predictions.
Key Vocabulary	Friction, drag, particles.

Lesson 6	
Learning Objective	**To recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.**
Declarative Knowledge	- A mechanism is a device that allows a small force to be increased to a larger force. - The pay back is that it requires a greater movement. - The small force moves a long distance and the resulting large force moves a small distance, e.g. a crowbar or bottle top remover. - Pulleys, levers and gears are all mechanisms, also known as simple machines.
Procedural Knowledge	Identifying and classifying.
Key Vocabulary	Pulleys, gears, levers, simple machines, mechanisms.

Year 5 – Summer 1 – Properties and changes of materials

Lesson 1	
Learning Objective	**To compare materials according to their properties.**
Declarative Knowledge	- Materials have different uses depending on their properties and state (liquid, solid, gas). - Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets.
Procedural Knowledge	Identifying and classifying.
Key Vocabulary	Properties, state of matter.

Lesson 2	
Learning Objective	**To investigate thermal conductors and insulators.**
Declarative Knowledge	- A thermal insulator does not conduct heat well. These can be used to control heat and keep things warm or cold. - A thermal conductor is the opposite so it allows heat to pass through it easily. - I can name examples of insulators and conductors.
Procedural Knowledge	Identifying and classifying.
Key Vocabulary	Conductor, insulator, heat, properties.

Lesson 3	
Learning Objective	**To investigate which electrical conductor make a bulb shine brightest.**
Declarative Knowledge	- Electrical conductors allow electricity to flow through them. - I can name examples of materials that are electrical conductors.
Procedural Knowledge	Identifying and classifying.
Key Vocabulary	Electrical conductors, current, insulator.

Lesson 4	
Learning Objective	**To investigate materials which dissolve.**
Declarative Knowledge	- Some materials dissolve in water. This means that they break down until they are no longer visible. - This liquid and solid mixture is called a solution. - I can name examples of materials that are soluble.
Procedural Knowledge	Making observations.
Key Vocabulary	Dissolve, solution, soluble, insoluble.

Lesson 5	
Learning Objective	**To use different processes to separate mixtures of materials.**
Declarative Knowledge	- Mixtures can be separated by filtering, sieving and evaporation.
Procedural Knowledge	Communicating ideas.
Key Vocabulary	Mixture, separation, filter, evaporate.

Lesson 6	
Learning Objective	**To identify and explain irreversible chemical changes.**
Declarative Knowledge	- Some changes to materials such as dissolving, mixing and changes of state are reversible. - Some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.
Procedural Knowledge	Identifying and classifying.
Key Vocabulary	Changes, reversible, irreversible, **examples of changes.**