

Year 6 Overview

6.1 Field Studies

Overview of the unit:

In this optional unit pupils use sampling techniques to support their studies of living things, using quadrats, sweep nets and other common field studies methods of finding out about animal and plant populations across the year. They compare populations in different areas and discuss the effectiveness of the different techniques they have used.

Children working below age-related expectations will be able to:	<ul style="list-style-type: none">▪ Use sampling techniques to record numbers of species▪ Make simple comparisons of the same habitat throughout the year
Children working at age-related expectations will be able to:	<ul style="list-style-type: none">▪ Use and evaluate some sampling techniques for environmental field work▪ Compare populations of living things during the course of the year▪ Provide reasons for the changes in population during the year
Children working above age-related expectations will be able to:	<ul style="list-style-type: none">▪ Describe the strengths and weaknesses of different sampling techniques▪ Explain differences in populations during the year▪ Provide reasons for the differences observed and measured in different areas

Resources required for this unit:

Quadrats, sweep nets, pooters – these can be bought commercially or constructed in school by pupils.

Clip boards, magnifying glasses, cameras, data loggers with light sensors (optional)

Depending on which activities are chosen: Watering can with rose heated greenhouse propagator, aquarium bubbler

6.2 Heart and Lungs

Overview of the unit:

Pupils study the circulatory system, learning about the basic components that make up blood, how the heart works and how blood circulates round the body. They learn about the lungs and the process of breathing and investigate the effect of exercise on the heart and breathing rates. They learn about the effects of smoking and alcohol.

Lesson	
1	Blood and what it is used for <ul style="list-style-type: none">Describe the functions of blood, including clottingKnow that blood is pumped round the body by the heartthat there are different groups of human blood
2	How blood circulates <ul style="list-style-type: none">Describe the basic structure of the circulatory systemExplain the functions of the heart, arteries veins and capillaries
3	The heart <ul style="list-style-type: none">Describe the structure of the heartExplain the basic function of the heart
4	The lungs <ul style="list-style-type: none">Describe the structure of the lungs and the basic functions of the lungsDescribe how the heart and lungs work together to keep us aliveRecord data and results using tables and line graphsReport and present findings from enquiries
5	Exercise, heart rate and breathing rate – investigation <ul style="list-style-type: none">Know that the heart rate can be determined by taking a pulse, and where pulse points are foundThrough investigation, describe the changes that take place in pulse rate and breathing rate before, during and after exerciseRelate these changes to the need for more oxygen and energy in the muscles
6	Harmful substances <ul style="list-style-type: none">Know that alcohol, smoking and the use of some drugs can harm the bodyDescribe some of the short term and long term effects of alcohol, smoking and drugs

Resources required for this unit

Digital microscope

Optical microscopes (you may be able to borrow these from a secondary school)

Commercially prepared slides of blood OR lancet, microscope slides, cover slips and stains to prepare your own

Data loggers and pulse rate sensors (optional)

6.3 Classification

Overview of the unit:

Pupils build on their knowledge of classification from previous years and look at the classification of invertebrates and microorganisms in more detail and playing games to help them learn about microorganisms and classes of invertebrates. They study yeast, observing its growth, using it to make bread.

Lesson	
1	The classification system for living things <ul style="list-style-type: none">▪ Name the five kingdoms of living things▪ Describe the characteristics of different vertebrate and invertebrate groups
2	Biodiversity <ul style="list-style-type: none">▪ Understand that there is a great variety of living things▪ Understand the term biodiversity▪ Know about some of the threats to biodiversity, including the threats posed by humans
3	Microorganisms <ul style="list-style-type: none">▪ Know that micro-organisms living things that are often too small to be seen with the naked eye▪ Know that whilst some micro-organisms bring about disease many others are useful▪ Create a key to identify microorganism classes
4	Investigating yeast <ul style="list-style-type: none">▪ Observe the growth of yeast and the waste products of yeast▪ Investigate the things yeast needs to grow▪ State some of the uses for yeast

Resources required for this unit

Clipboards, cameras, identification guides or apps

6.4 Electricity

Overview of the unit: Pupils build on their learning from Year 4 to learn more about circuits, including how to use recognised symbols to represent circuits. They investigate how to change the amount of electricity flowing round a circuit, looking at how different components affect the flow of electricity and at the difference that the length and thickness of wires can make. They learn about series and parallel circuits and they use their knowledge of electricity to build games that use electric circuits.

Lesson	Learning objectives
1	Simple circuits <ul style="list-style-type: none">Construct simple series circuits and identify the uses of different componentsKnow how to stay safe when working with electricity
2	Circuit Diagrams <ul style="list-style-type: none">Describe the use of different components within a circuit: cells, wire, switch, buzzer, bulb, motorRepresent and reproduce simple circuits in diagrams using recognised symbolsExamine an unfamiliar diagram of a simple circuit and explain how they know whether it will work when constructed
3	Effect of voltage on a circuit <ul style="list-style-type: none">Investigate how differences in voltage affect the performance of components within a circuitPlan and carry out an investigation, ensuring a fair testMake accurate measurements and draw conclusions based on results
4	Investigating wires <ul style="list-style-type: none">Plan an investigation, recognising and controlling variables where necessaryTake measurements, using a range of scientific equipment, with accuracy and precision, repeating readings when appropriateRecord data and results of increasing using circuit diagrams, tables and line graphsDraw conclusion and explain the degree of trust in results
5	Series and Parallel Circuits <ul style="list-style-type: none">Describe the differences between series and parallel circuitsBuild simple series and parallel circuits to solve problems
6	Designing circuits for games <ul style="list-style-type: none">Design and build a game that involves an electric circuitEvaluate the game

Resources Required for this Unit:

Electricity kits: bulbs, bulb holders, cells, battery holders, switches, crocodile clips, wires, buzzers, motors, fans.

Magnifying glasses

Data loggers and light sensors (optional)

Ammeters (optional)

6.5 Light

Overview of the unit: Pupils build on their work on light in Year 3 to make more detailed investigations of shadows. They use their conclusions from this work to create shadow puppets and use special effects in their puppet shows. They study reflectivity, build a periscope and investigate the effectiveness of sunglasses, learning about the dangers of UV light.

Lesson	
1	Reviewing what we know about light <ul style="list-style-type: none">describe and give examples of light sourcesstate some basic properties of lightknow that light travels in straight lines
2	Investigating Shadows <ul style="list-style-type: none">investigate changes in shadows depending on the relative positions of the light source and object and the use of filtersplan an investigation, recognising and controlling variablestake measurements with accuracy and precision, repeating readings when appropriaterecord results using scientific diagrams, tables, and graphs
3	Shadow puppets <ul style="list-style-type: none">Establish the best arrangement of light source and position of object in a shadow puppet theatreDevise and perform a shadow puppet show using their knowledge of shadows to add dramatic interest
4	Exploring reflectivity <ul style="list-style-type: none">Know that many objects reflect lightRepresent the direction of a beam or ray of light travelling from a light source by a straight line with an arrowUse the properties of reflection to make periscopes
5	How the eye works <ul style="list-style-type: none">Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyesKnow the basic structure of the eye

Resources Required for this Unit:

Data loggers with light sensors,

Light sources, e.g. torches

Materials that are transparent, translucent and opaque

Protractors and rulers

Plane mirrors and holders

Double sided convex lenses

Low-powered ultra-violet lamp and colour-changing UV beads

6.6. Evolution

Overview of the unit: Pupils learn about the life and work of Charles Darwin and what is meant by the terms evolution and survival of the fittest. They learn how animals and plants are adapted to their environment. They investigate camouflage and find out how humans evolved. They carry out a simple experiment to model evolution and selective breeding.

Lesson	Learning objectives
1	The life and work of Charles Darwin <ul style="list-style-type: none">▪ Research and recount the main events in the life of Charles Darwin▪ Describe the contribution he made to scientific knowledge about evolution
2	Introduction to evolution <ul style="list-style-type: none">▪ Understand the term evolution▪ Explore the reasons that some people do not believe that evolution happened and look at some creation stories from different religions, e.g. the Vikings
3	Adaptation and Survival of the fittest <ul style="list-style-type: none">▪ Research the ways in which animals and plants are adapted to their environment▪ Describe ways in which animals are adapted to avoid predation, for example camouflage, use of warning colours in insects, spines on plants
4	Fossils <ul style="list-style-type: none">▪ explain how fossils provide evidence for evolution▪ explain how humans have evolved
5	Evolution investigation <ul style="list-style-type: none">▪ Model evolution through the use of games/simulations▪ Model and compare evolution and selective breeding

Resources required for this unit:

No special equipment is required for this unit.