

Science enquiry types

There are six science enquiry types:

- comparative/fair testing
- research
- observation over time
- pattern-seeking
- identifying, grouping and classification
- problem-solving

Some enquiry types lend themselves particularly well to certain aspects of science and may become a focus for a project. For example, identifying, grouping and classification lends itself to work on plants, animals and materials; observation over time lends itself to work on plants and materials; research lends itself to work on humans and Earth and space; and comparative/fair testing and pattern-seeking lend themselves to work on materials, forces, light and sound. Problem-solving can be applied to any area of science. Even if a project has a focus enquiry type, other types will still be included, with all the types covered multiple times over the course of each school year. The following tables show the lessons covering the different enquiry types in each science project.

Year 1

		Comparative/fair testing	Research	Observation over time	Pattern-seeking	Identifying, grouping and classification	Problem-solving
Project	Lesson	<i>Changing one variable to see its effect on another whilst keeping all others the same.</i>	<i>Using secondary sources of information to answer scientific questions.</i>	<i>Observing changes that occur over a period of time ranging from minutes to months.</i>	<i>Identifying patterns and looking for relationships in enquiries where variables are difficult to control.</i>	<i>Making observations to name, sort and organise items.</i>	<i>Applying prior scientific knowledge to find answers to problems.</i>

Everyday Materials	Introductory knowledge: What are materials?					✓	
	Engage lesson 1: Introducing natural materials					✓	
	Engage lesson 2: Human-made materials					✓	
	Engage lesson 3: Identification and classification					✓	
	Develop lesson 1: Properties of materials					✓	
	Develop lesson 2: Venn diagrams					✓	
	Develop lesson 3: Testing and recording materials' properties				✓	✓	
	Innovate: Observing, measuring and recording	✓		✓			✓

Human Senses	Engage lesson 2: How many?				✓		
	Engage lesson 3: Similarities and differences					✓	
	Develop lesson 1: Functions					✓	
	Develop lesson 2: Why do we need our senses?		✓				
	Develop lesson 3: Sensory loss and assistive tools		✓				
	Develop lesson 4: Investigating our sense of touch					✓	
	Innovate: Planning and carrying out	✓					
Seasonal Changes	Engage lesson 1: Experiencing the season				✓		
	Engage lesson 2: Deciduous and evergreen trees					✓	
	Engage Lesson 3: Seasonal changes in deciduous trees			✓		✓	
	Engage lesson 4: Seasonal changes in animals			✓			
	Develop lesson 1: Day length				✓		
	Develop lesson 2: Sun's rays	✓		✓			✓
	Develop lessons 3a/3b: Measuring and recording the wind			✓			
	Develop lessons 4a/4b: Measuring and recording temperature			✓	✓		
	Develop lesson 5: Measuring precipitation			✓			
	Innovate: Asking and answering questions	✓		✓			✓

Plant Parts	Engage lesson 1: Seasonal changes in plants			✓			
	Engage lesson 2: Identifying plants					✓	
	Develop lesson 1: Seeds and bulbs		✓			✓	
	Develop lesson 2: Investigating leaves					✓	
	Develop lesson 3: Importance of plants		✓				
	Develop lesson 4: My plant			✓			
	Innovate: Reporting and concluding					✓	

Animal Parts	Engage lesson 1: Identifying animal parts					✓	
	Engage lesson 2: Grouping animals					✓	
	Engage lesson 3: Sorting and pattern seeking				✓	✓	
	Develop lesson 1: Our pets					✓	
	Develop lesson 2: Carnivore, herbivore, omnivore					✓	
	Develop lesson 3: Class pet		✓				
	Develop lesson 4: Observation and simple tests	✓		✓			
	Innovate: Observing, measuring and recording	✓	✓	✓		✓	

Year 2

		Comparative/fair testing	Research	Observation over time	Pattern-seeking	Identifying, grouping and classification	Problem-solving
Project	Lesson	<i>Changing one variable to see its effect on another whilst keeping all others the same.</i>	<i>Using secondary sources of information to answer scientific questions.</i>	<i>Observing changes that occur over a period of time ranging from minutes to months.</i>	<i>Identifying patterns and looking for relationships in enquiries where variables are difficult to control.</i>	<i>Making observations to name, sort and organise items.</i>	<i>Applying prior scientific knowledge to find answers to problems.</i>
Human Survival	Engage lesson 1: Human life cycle					✓	
	Develop lessons 2a/2b: Exercise challenge			✓	✓		
	Develop lesson 4: Why should we use soap?	✓					
	Innovate: Reporting and concluding			✓			✓
Habitats	Engage lesson 1: Living and non-living things					✓	
	Engage lesson 2: Identifying plants and animals in a habitat					✓	
	Engage lesson 3: Why do these animals live in this habitat?		✓				
	Develop lesson 2: Animal adaptations				✓		
	Develop lesson 3: Plant adaptations					✓	
	Innovate: Reporting and concluding					✓	✓

Uses of Materials	Engage lesson 1: Exploring everyday materials				✓	✓	
	Engage lesson 2: Shaping materials					✓	
	Engage lesson 3: Bending, stretching, twisting and squashing					✓	
	Develop lesson 2: Testing paper	✓		✓			✓
	Develop lesson 3: The problem with materials		✓			✓	✓
	Innovate: Asking and answering questions	✓					✓

Plant Survival	Engage lesson 1: Exploring seasonal plants					✓	
	Engage lesson 2: Germination Investigation	✓		✓			
	Develop lesson 2: What do plants need to grow?	✓		✓			
	Develop lesson 3: Unusual plants		✓				
	Innovate: Observing, measuring and recording	✓		✓	✓		

Animal Survival	Engage lesson 1: Introducing Invertebrates					✓	
	Engage lesson 2: Microhabitats					✓	
	Engage lesson 3: Animal needs		✓				✓
	Engage lesson 5: Human impacts						
	Develop lesson 1: Life process of reproduction				✓	✓	
	Develop lesson 2: Life cycles				✓		
	Develop lesson 3: Observing insect lifecycles			✓			
	Develop lesson 4: Seasonal changes				✓		
	Innovate: Planning and carrying out						✓

Year 3

		Comparative/fair testing	Research	Observation over time	Pattern-seeking	Identifying, grouping and classification	Problem-solving
Project	Lesson	<i>Changing one variable to see its effect on another whilst keeping all others the same.</i>	<i>Using secondary sources of information to answer scientific questions.</i>	<i>Observing changes that occur over a period of time ranging from minutes to months.</i>	<i>Identifying patterns and looking for relationships in enquiries where variables are difficult to control.</i>	<i>Making observations to name, sort and organise items.</i>	<i>Applying prior scientific knowledge to find answers to problems.</i>

Animal Nutrition and the Skeletal System	Engage lesson 1: Asking questions		✓				
	Engage lesson 2: Balanced and nutritious					✓	✓
	Engage lesson 3: Investigating fatty foods			✓			
	Engage lesson 4: Animal diets					✓	
	Develop lesson 4: Skeleton types					✓	
	Innovate: Asking and answering questions		✓				✓

Forces and Magnets	Introductory knowledge: What is a force?					✓	
	Engage lessons 4a/4b: Measuring and recording frictional forces	✓			✓		✓
	Develop lesson 2: Exploring magnets				✓		
	Develop lesson 4: Grouping and sorting magnetic materials					✓	
	Develop lesson 6: Uses of magnets and friction		✓				
	Innovate: Observing, measuring and recording	✓			✓		

Plant Nutrition and Reproduction	Engage lessons 2a/2b: Focus on stems	✓		✓			
	Engage lessons 3a/3b: Investigating plant vessels	✓		✓			
	Engage lesson 4: Focus on leaves	✓			✓		
	Develop lesson 2: Flower anatomy				✓	✓	
	Develop lesson 3: Pollination		✓				
	Develop lesson 4: Seeds and seed dispersal					✓	
	Innovate: Planning and carrying out	✓		✓			✓
Light and Shadows	Engage lesson 1: Exploring light	✓		✓			
	Engage lesson 2: Identify and classify					✓	
	Engage lesson 3: Investigating reflective materials				✓	✓	✓
	Engage lesson 5: Investigating Sun safety	✓		✓			
	Develop lesson 2: Opaque, transparent and translucent				✓		
	Develop lesson 3: Observing changes in shadows				✓		
	Develop lesson 4: Research about light, reflectors and shadows		✓				
	Innovate: Reporting and concluding	✓		✓	✓		

Year 4

		Comparative/fair testing	Research	Observation over time	Pattern-seeking	Identifying, grouping and classification	Problem-solving
Project	Lesson	<i>Changing one variable to see its effect on another whilst keeping all others the same.</i>	<i>Using secondary sources of information to answer scientific questions.</i>	<i>Observing changes that occur over a period of time ranging from minutes to months.</i>	<i>Identifying patterns and looking for relationships in enquiries where variables are difficult to control.</i>	<i>Making observations to name, sort and organise items.</i>	<i>Applying prior scientific knowledge to find answers to problems.</i>
Food and the Digestive System	Engage lesson 1: Ecosystems		✓				
	Develop lesson 1: Purpose and parts					✓	
	Develop lesson 2: Teeth types					✓	
	Develop lesson 3: Healthy teeth		✓				
	Innovate: Planning and carrying out	✓		✓			✓
Sound	Engage lesson 1: Exploring sound				✓		
	Engage lesson 2: How does sound travel?				✓		
	Engage lesson 3: How do we hear sounds?		✓				
	Develop lesson 1: Muffling sounds	✓			✓		✓
	Develop lesson 2: Volume and distance investigation	✓			✓		
	Develop lesson 3: Changing the volume of sounds	✓			✓		
	Develop lesson 4: Changing the pitch of sounds				✓		
	Innovate: Planning and carrying out	✓					

States of Matter	Introductory knowledge: Solids, liquids and gases					✓	
	Engage lesson 1: Classifying solids, liquids and gases					✓	
	Develop lessons 3a/3b: Observing, measuring and recording changes over time			✓	✓		
	Develop lesson 4: Melting and boiling points		✓		✓		
	Innovate: Observing, measuring and recording	✓		✓			

Grouping and Classifying	Introductory knowledge: What is classification?					✓	
	Engage lesson 1: Guess who?					✓	
	Engage lesson 2: Understanding classification keys					✓	
	Engage lesson 3: Creating classification keys					✓	
	Develop lesson 1: Animal kingdom					✓	
	Develop lesson 2: Sorting vertebrates					✓	
	Develop lesson 3: Sorting invertebrates					✓	
	Develop lesson 4: Plant kingdom					✓	
	Develop lesson 5: Plant kingdom classification keys					✓	
	Innovate: Reporting and concluding		✓			✓	✓

Electrical Circuits and Conductors	Introductory knowledge: Exploring electricity					✓	
	Engage lesson 2: Making series circuits	✓					
	Engage lesson 3: Fixing circuits						✓
	Develop 1, lesson 2: Investigating conductive and non-conductive materials	✓					✓
	Develop 1, lesson 4: Understanding plugs					✓	
	Develop 1, lesson 5: Researching incandescent light bulbs		✓				
	Develop 2, lesson 1: Programmable technologies					✓	
	Develop 2, lesson 3: Programming traffic lights						✓
	Innovate: Designing and making a nightlight						✓

Year 5

		Comparative/fair testing	Research	Observation over time	Pattern-seeking	Identifying, grouping and classification	Problem-solving
Project	Lesson	<i>Changing one variable to see its effect on another whilst keeping all others the same.</i>	<i>Using secondary sources of information to answer scientific questions.</i>	<i>Observing changes that occur over a period of time ranging from minutes to months.</i>	<i>Identifying patterns and looking for relationships in enquiries where variables are difficult to control.</i>	<i>Making observations to name, sort and organise items.</i>	<i>Applying prior scientific knowledge to find answers to problems.</i>

Forces and Mechanisms	Engage lesson 1: Gravity	✓					
	Engage lesson 2: Mass and weight				✓		
	Engage lesson 3: Discovery		✓				
	Develop 1, lesson 1: Friction	✓			✓		✓
	Develop 1, lesson 2: Air resistance	✓			✓		✓
	Develop 1, lesson 3: Water resistance	✓			✓		✓
	Develop 2, lesson 1: Levers	✓					✓
	Develop 2, lesson 2: Pulleys	✓			✓		✓
	Develop 2, lesson 3: Gears						✓
	Develop 2, lesson 4: Researching forces and mechanisms		✓				✓
	Innovate: Observing, measuring and recording	✓	✓				✓

Earth and Space	Engage lesson 1: How do we know that the Sun is at the centre of the Solar System?		✓				
	Develop 1, lesson 2: Sundials			✓	✓		
	Develop 1, lesson 4: Times of day around the world		✓				
	Develop 2, lesson 2: Lunar and solar eclipses		✓				
	Innovate: Research		✓				

Human Reproduction and Ageing	Engage lesson 1: Animal life cycles					✓	
	Engage lesson 2: Classifying mammals					✓	
	Engage lesson 4: Relationship between mammalian gestation and mass		✓		✓		
	Develop lesson 2: Human juvenile stage		✓		✓		
	Develop lesson 3: Human adolescent stage					✓	
	Develop lesson 4: Human growth charts				✓		
	Develop lesson 6: Human adult ageing		✓				
	Innovate: Reporting and concluding	✓			✓		✓

Properties and Changes of Materials	Engage lesson 1: Testing properties	✓				✓	✓
	Engage lesson 2: Thermal conductivity	✓			✓	✓	
	Engage lesson 3: Measuring change in temperature	✓		✓	✓		
	Engage lessons 4a/4b: Testing thermal insulators	✓		✓	✓		✓
	Engage lesson 5: Solubility	✓				✓	
	Develop 1, lesson 1: Exploring mixtures - sieving					✓	✓
	Develop 1, lessons 2a/2b: Exploring mixtures - filtering			✓			✓
	Develop 1, lessons 3a/3b: Exploring mixtures - evaporating			✓			✓
	Develop 1, lesson 4: Researching reversible mixtures		✓				
	Develop 2, lesson 1: Reversible and irreversible changes					✓	
	Develop 2, lesson 2: Irreversible changes			✓			
	Innovate: Planning and carrying out			✓			✓
	Express: Innovative materials		✓				

Year 6

		Comparative/fair testing	Research	Observation over time	Pattern-seeking	Identifying, grouping and classification	Problem-solving
Project	Lesson	<i>Changing one variable to see its effect on another whilst keeping all others the same.</i>	<i>Using secondary sources of information to answer scientific questions.</i>	<i>Observing changes that occur over a period of time ranging from minutes to months.</i>	<i>Identifying patterns and looking for relationships in enquiries where variables are difficult to control.</i>	<i>Making observations to name, sort and organise items.</i>	<i>Applying prior scientific knowledge to find answers to problems.</i>

Circulatory System	Engage lesson 1: Role of the circulatory system		✓				
	Engage lesson 2: Structure and function of the heart					✓	
	Engage lesson 3: The function of blood		✓				
	Develop 1, lesson 1: Measuring heart rate				✓		✓
	Develop 1, lesson 2: Proving a hypothesis	✓			✓		
	Develop 1, lesson 3: Heart rate investigation	✓					✓
	Develop 2, lesson 1: Classifying foods					✓	✓
	Develop 2, lesson 2: The effects of smoking, alcohol and drugs		✓				
	Innovate: Reporting and concluding	✓		✓	✓		

Electrical Circuits and Components	Introductory knowledge: Naming circuit components					✓	
	Engage lesson 1: Recognised circuit symbols					✓	
	Engage lesson 3: Exploring circuit components	✓					✓
	Develop lesson 1: Voltage and cells				✓		
	Develop lesson 2: Researching batteries and cells		✓				
	Develop lesson 3: Investigating voltage	✓			✓		
	Develop lesson 5: Sensors and monitoring						✓

Light Theory	Engage lesson 2: How do we see?		✓				
	Engage lesson 4: Colour perception				✓		
	Develop lesson 1: Shadows				✓		
	Develop lesson 2: Reflections			✓			✓
	Develop lesson 3: Measuring light	✓			✓		
	Develop lesson 4: Refraction		✓	✓			
	Innovate: Planning and carrying out	✓			✓		✓

Evolution and Inheritance	Introductory knowledge: Five kingdoms					✓	
	Engage lesson 1: Classifying fossils					✓	
	Develop lesson 1: Inheritance				✓		
	Develop lesson 2: Natural selection and survival of the fittest	✓					
	Develop lesson 3: Exploring plant adaptations	✓			✓		
	Develop lesson 4: Artificial selection		✓				✓
	Innovate: Observing, measuring and recording				✓		