



Scheme of Work		
Years: 5&6	Title: Forces in Action	Weeks: 6 weeks
<p>Rationale</p> <p>This unit develops pupils' understanding of forces and how they affect movement within the world around us. Pupils explore how different forces act upon objects and investigate concepts including gravity, friction, air resistance, water resistance and mechanisms. Through scientific enquiry, practical investigation and disciplinary thinking, pupils investigate how forces can be observed, measured and applied in real-life contexts.</p> <p>Learning is designed to encourage curiosity, questioning and ambitious thinking through meaningful contexts and practical exploration. Pupils investigate how scientists use observation and evidence to understand invisible forces, consider how scientific understanding supports invention and explore how forces influence everyday experiences and technological developments.</p> <p>The unit uses carefully selected Reading Spine texts including scientific information texts, biographies and invention-based texts to promote disciplinary reading and deepen understanding. These texts provide opportunities to explore scientific discovery, innovation, perseverance and problem-solving whilst developing vocabulary, fluency and comprehension.</p> <p>Learning experiences are designed to:</p> <ul style="list-style-type: none"> • develop secure knowledge and understanding of forces and movement • build scientific enquiry, reasoning and evidence-based thinking skills • develop curiosity through investigation, prediction and experimentation • strengthen understanding of scientific vocabulary and concepts through repeated application • provide opportunities for retrieval, observation and interpretation • develop confidence in communicating scientific ideas through spoken, practical and written outcomes • create meaningful opportunities for discussion, collaboration and problem-solving • encourage pupils to consider how scientific understanding influences everyday life and technological development • provide opportunities to explore innovation and achievement through scientists and inventors • promote positive attitudes towards science, enquiry and lifelong learning • support pupils to make connections across subjects and apply learning in meaningful contexts • ensure pupils access ambitious learning through adaptive approaches without reducing curriculum expectations <p>By the end of the unit pupils will understand that scientific understanding develops through evidence, investigation and discovery and that invisible forces continue to shape the world around us.</p>		
<p>Adaptive Teaching</p> <p>This unit applies Storybrook SEMH principles with particular emphasis on practical enquiry and collaborative investigation.</p> <p>Examples of adaptation within this unit include:</p> <ul style="list-style-type: none"> • visual timetables and now/next supports • vocabulary pre-teaching and rehearsal • sentence stems and modelling • chunked instructions and reduced cognitive load • oral rehearsal before recording ideas • alternative recording methods (drawing, practical outcomes, verbal responses) • sensory and movement opportunities where needed 		



- emotional check-ins and regulation support

Challenge and Greater Depth Opportunities

Pupils demonstrating secure understanding may be challenged through:

- increasingly independent application of learning
- deeper questioning and higher-order thinking
- interpretation and evaluation of evidence
- more sophisticated use of disciplinary and subject-specific vocabulary
- extended reasoning and justification of ideas
- leadership, collaboration and peer-support opportunities
- greater complexity within written, practical and presentation outcomes
- opportunities to make connections across subjects and contexts
- independently plan and refine investigations linked to forces and movement
- analyse patterns within results and evaluate the reliability of evidence
- justify scientific explanations using multiple pieces of evidence and precise scientific vocabulary
- apply understanding of forces to unfamiliar real-world contexts and explain outcomes

Hook

Pupils enter a classroom transformed into a **Forces Investigation Laboratory and Engineering Challenge Zone** containing:

- mystery investigation boxes (*magnets, toy cars, parachutes, springs, ramps, gears, pulleys, levers and force meters*)
- investigation stations exploring pushes, pulls and movement
- ramps and vehicles for testing speed and friction
- parachutes, paper helicopters and flying objects suspended around the classroom
- videos and images of rockets, rollercoasters, racing cars and extreme sports
- pulley and lever challenge stations
- mystery force investigation cards
- prediction challenge boards
- scientific diagrams and force vocabulary stations
- real-life examples of forces in action (*sporting equipment, bicycles, tools and machines*)
- scientist and engineer challenge cards
- dramatic sound effects and motion videos

Opening challenge

Can you become a scientist and discover how invisible forces change the way objects move and behave?

Writing Outcomes

By the end of the unit pupils will:

- compose explanation texts describing forces including gravity, friction, air resistance, water resistance and mechanisms
- write comparative responses identifying similarities and differences between forces and their effects on movement
- create diary entries and first-person narratives from the perspective of scientists, engineers, inventors or investigators
- write balanced arguments and persuasive responses linked to scientific questions and viewpoints
- use evidence from investigations, observations, texts and discussion to explain ideas and justify thinking
- create information texts, investigation reports, presentations or scientific explanations linked to forces

Mixed-age challenge (Year 6 depth):

- explain understanding using increasingly precise scientific and disciplinary vocabulary independently
- justify scientific explanations using evidence from multiple investigations and sources
- compare and evaluate information from different scientific sources independently
- explain relationships between variables and patterns identified within investigations independently



	<ul style="list-style-type: none"> • use scientific models and representations to explain scientific ideas independently (e.g. force arrows, diagrams, graphs and labelled models) • compose explanations of gravity, friction and mechanisms • create investigation reports • write persuasive responses linked to engineering design choices • explain interaction between multiple forces • identify variables affecting outcomes • evaluate reliability of investigations • justify scientific conclusions using evidence
<p>Outcomes:</p> <p>By the end of the unit pupils produce:</p> <ul style="list-style-type: none"> • a Forces Investigation Showcase shared with adults, peers or visitors demonstrating understanding of forces and their effects on movement • a collection of spoken, practical and written learning evidence • a written explanation, balanced argument, investigation report or persuasive outcome demonstrating understanding of forces and movement • annotated diagrams, tables, graphs and scientific representations linked to investigations and observations • labelled diagrams and evidence analysis linked to forces, mechanisms and practical investigations • predictions, questions and responses linked to enquiry activities and scientific investigations • comparative work linked to gravity, friction, air resistance, water resistance and mechanisms • a practical or creative outcome linked to learning (e.g. <i>parachute investigations, pulley systems, force demonstrations, model mechanisms or engineering challenge outcomes</i>) • vocabulary-rich classroom display work linked to scientific concepts and disciplinary vocabulary • a collaborative presentation, demonstration or scientific enquiry outcome explaining learning and ideas • digital or creative outcomes such as presentations, podcasts, videos or recorded explanations where appropriate • scientific investigation activities using evidence to support explanations and conclusions • written reflections and evaluations linked to key enquiry questions and scientific thinking 	<p>Success Criteria:</p> <p>By the end of the unit most pupils will be able to:</p> <ul style="list-style-type: none"> • use topic vocabulary accurately within discussion and learning activities • identify and describe the effects of gravity, friction, air resistance and water resistance • explain that unsupported objects fall towards the Earth because of gravity • recognise that mechanisms including levers, pulleys and gears can allow a smaller force to have a greater effect • identify and describe similarities and differences between forces and their effects on movement • use scientific observations, investigations and texts to retrieve and interpret information • ask relevant scientific questions and discuss ideas thoughtfully using scientific vocabulary • retrieve information and apply learning during discussion, investigation and reflection activities • identify patterns and relationships within scientific investigations and observations • take measurements with increasing accuracy and precision using appropriate equipment and methods • record ideas, observations and responses using appropriate vocabulary and sentence structures • use evidence from observations, investigations, texts, diagrams and practical experiences to explain ideas and justify thinking • explain effects of gravity, friction and resistance • identify patterns within investigations • explain how mechanisms change force and movement <p>Year 6 extension:</p>



	<ul style="list-style-type: none"> • explain scientific understanding using increasingly precise scientific and disciplinary vocabulary independently • interpret and evaluate information from scientific investigations and identify possible limitations or reliability issues • justify scientific explanations using evidence from multiple investigations and sources • identify relationships and patterns within scientific data and observations • explain relationships between force size and movement outcomes independently • explain how multiple forces can act simultaneously and influence movement • compare the effects of multiple forces acting together using evidence from investigations • compare and evaluate different explanations and findings independently • make reasoned scientific conclusions supported by evidence • explain how variables may influence outcomes within investigations independently • explain interaction of multiple force • evaluate reliability of investigations • identify relationships between variables • explain effects of gravity and resistance • identify patterns in investigations • explain how mechanisms change force
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<p>Secure End Point</p> <p>Pupils can:</p> <ul style="list-style-type: none"> • explain how forces affect movement and describe how forces act on objects • identify and explain the effects of gravity, friction, air resistance and other forces within different contexts • use observations and evidence from investigations to identify patterns and justify conclusions • use scientific vocabulary accurately to explain ideas and communicate findings • communicate scientific understanding confidently through spoken, practical and written outcomes 	
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<p>Common Misconceptions</p> <p>Pupils may think:</p> <ul style="list-style-type: none"> • forces only happen when objects are moving • a force is an object rather than a push or pull acting on an object • heavier objects always fall faster than lighter objects • gravity only exists on Earth and does not act on other objects in space • gravity causes objects to stop moving rather than pulling objects towards the Earth 	<p>Sticky Knowledge (Non-negotiable Learning)</p> <p>By the end of this unit pupils will know:</p> <ul style="list-style-type: none"> • a force is a push or a pull acting on an object • forces can affect the movement, direction, speed or shape of an object • gravity is a force that pulls objects towards the Earth • friction is a force that acts between surfaces and resists movement • air resistance is a force that acts against moving objects travelling through air
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- friction always makes movement impossible rather than slowing or resisting movement
- air resistance and friction are the same force
- forces can only slow things down and cannot change direction or speed
- larger objects always need greater forces to move
- moving objects always require a force to keep them moving
- magnets attract all metals rather than only certain materials
- all forces require physical contact between objects
- water resistance and air resistance work differently rather than both being examples of resistive forces
- machines and mechanisms create energy rather than transferring forces or changing movement
- the direction of a force does not affect movement
- scientific diagrams and force arrows are exact representations rather than simplified models used to explain ideas

- water resistance is a force that acts against objects moving through water
- magnets create forces that can attract or repel certain materials
- magnetic forces can act without objects touching
- some forces require contact between objects and some forces act at a distance
- the size and direction of a force can influence movement and outcomes
- mechanisms such as levers, pulleys and gears help transfer forces and make work easier
- scientists use observation, evidence and investigation to understand how forces work
- fair testing helps scientists identify relationships and patterns
- evidence gathered from investigations helps scientists explain and justify conclusions
- forces act continuously in everyday life and influence the movement of objects around us
- scientific vocabulary supports accurate explanation and communication of ideas

Science Core Learning and Wider Application

Core taught content within this unit:

- identify different forces and their effects
- explain gravity, friction and air resistance
- investigate how forces affect movement

Wider application and retrieval opportunities:

- plan investigations and interpret results
- identify patterns within evidence
- justify conclusions using scientific vocabulary

Retrieval Opportunities

Week 1 - prior knowledge discussion linked to previously studied science learning, forces in everyday life and existing understanding of movement; discuss existing knowledge and misconceptions about forces

Week 2 - recall key vocabulary linked to gravity, force and movement through discussion and oral rehearsal

Week 3 - retrieve information from investigations, observations and practical activities; identify and explain the effects of friction using scientific language

Week 4 - retrieve and apply learning linked to gravity, friction and resistance through discussion, prediction and investigation activities



Week 5 - retrieve and compare learning from Weeks 1-4 including gravity, friction and resistance through mechanisms and investigation evidence

Week 6 - retrieve and communicate learning from the whole unit using scientific vocabulary, evidence and enquiry outcomes

Retrieval methods used throughout the unit:

- vocabulary retrieval
- retrieval grids
- discussion prompts
- sequencing activities
- picture retrieval tasks
- oral rehearsal and low-stakes quizzes
- quick-fire recall questions
- partner discussion and talk tasks
- investigation retrieval activities
- observation and evidence interpretation activities
- retrieval linked to texts, diagrams and scientific evidence
- prediction and scientific enquiry questions
- revisit prior learning through practical investigations and collaborative challenges

Prior Learning

Pupils may already:

Reading

- retrieve information from fiction and non-fiction texts
- identify key information from diagrams, images and scientific texts
- discuss themes, ideas and viewpoints within texts
- make predictions and inferences using evidence from texts
- explain ideas using evidence from reading and discussion
- discuss similarities and differences between objects, materials and scientific concepts

Reading Retrieval Opportunities

- retrieval of scientific vocabulary and investigation concepts
- flashback questions linked to previous scientific learning
- recall of sticky knowledge through investigations and observations
- retrieval through explanation, discussion and scientific reasoning

Writing

- orally rehearse ideas before recording them
- write descriptions, explanations and information texts
- write diary entries and first-person narratives
- organise ideas into linked paragraphs
- communicate ideas through spoken and written outcomes
- use evidence to support explanations and responses

Grammar and Punctuation

- use expanded noun phrases and ambitious vocabulary to add detail



- use conjunctions to extend and explain ideas
- use fronted adverbials and adverbial phrases
- organise writing into paragraphs around a theme
- use commas for clarity and expanded sentence structures
- use speech punctuation accurately where appropriate

Spoken Language / Oracy

- ask and answer questions linked to learning experiences
- explain opinions and ideas clearly during discussion
- participate in collaborative learning and group discussion
- build upon and respond appropriately to the ideas of others
- justify ideas using evidence and reasoning

Science and Wider Curriculum

- understand that forces can cause movement and change
- recognise that pushes and pulls can affect objects in different ways
- observe and describe movement and changes during practical activities
- ask questions and investigate ideas through practical enquiry
- recognise patterns and identify similarities and differences
- record observations using tables, diagrams and simple scientific representations
- understand that evidence helps scientists explain ideas about the world around them

Spelling

Pupils apply:

- spelling patterns and rules taught through the school spelling programme and English curriculum
- Year 5 and Year 6 statutory spelling expectations
- prefixes and suffixes taught previously
- topic vocabulary linked to scientific learning
- increasingly ambitious vocabulary within written outcomes

Building on Prior Learning

Pupils build upon previous experiences of observing movement, identifying pushes and pulls and conducting practical scientific investigations. Prior understanding of prediction, observation and evidence gathering supports pupils in developing scientific explanations linked to forces and movement.

Pupils may already:

- identify and describe simple pushes, pulls and movement in everyday experiences
- observe and compare how objects move in different ways
- ask scientific questions and make simple predictions
- carry out practical investigations and record observations
- identify patterns from investigations and experiences
- use evidence from observations to explain ideas
- understand that scientists investigate questions through testing and enquiry
- use scientific vocabulary to describe observations and findings

Future learning prepares pupils to:

- investigate increasingly complex scientific concepts
- recognise relationships between variables



- use evidence to explain scientific ideas
- understand how scientific enquiry develops knowledge

Spelling

Pupils apply:

- spelling patterns and rules taught through the school spelling programme and English curriculum
- Year 5 and Year 6 statutory spelling expectations
- prefixes and suffixes including **inter-**, **sub-**, **super-**, **anti-** and **auto-**
- words containing silent letters
- words ending in **-cial**, **-tial**, **-cially** and **-tially**
- words ending **-ent**, **-ence**, **-ency**, **-ant**, **-ance** and **-ancy**
- words with **ie** and **ei** patterns
- use of hyphens where appropriate
- ambitious topic vocabulary linked to scientific learning
- accurate spelling of increasingly complex subject-specific vocabulary within written outcomes

Spelling application opportunities throughout the unit:

- vocabulary pre-teaching and oral rehearsal
- explicit morphology and word meaning exploration
- etymology links (*scientific vocabulary origins where appropriate*)
- retrieval of previously taught statutory words
- sentence-level application in scientific writing
- editing and proofreading activities
- independent application within extended writing outcomes
- accurate application of scientific vocabulary within investigation write-ups and explanations
- use of key scientific and disciplinary vocabulary during practical enquiry and discussion

Grammar and Punctuation Focus

Pupils develop:

- use of expanded noun phrases to add detail and precision
- use of relative clauses beginning with **who**, **which**, **where**, **when**, **whose** or **that**
- use of modal verbs to indicate possibility or certainty (*could*, *would*, *should*, *might*, *must*)
- use of adverbials and fronted adverbials to develop cohesion and sequence within explanations and investigations
- use of parenthesis through brackets, commas and dashes to add information
- use of commas to clarify meaning and avoid ambiguity
- use of cohesive devices within and across paragraphs (*for example: however, therefore, meanwhile, consequently, in contrast*)
- use of organisational devices including headings, subheadings, bullet points and underlining where appropriate
- use of direct and reported speech where appropriate (*e.g. reporting findings, scientist viewpoints or discussion outcomes*)
- use of active and passive voice to change emphasis and effect (*e.g. "The object moved..." / "The object was moved..."*)
- use of formal and informal language appropriately according to audience and purpose
- use of colons to introduce lists and explanations
- use of semi-colons to mark relationships between closely related clauses
- use of hyphens to avoid ambiguity where appropriate
- use of punctuation including commas, apostrophes, brackets, dashes, colons and semi-colons accurately within writing
- organise ideas into coherent paragraphs and increasingly sustained pieces of scientific writing
- edit and improve grammar and punctuation through discussion, peer support and adult guidance

Mixed-age challenge (Year 6 depth):

- use passive and active voice purposefully to alter emphasis and effect within scientific explanations and investigation writing



	<ul style="list-style-type: none"> • select formal language structures appropriately for scientific reports and presentations • use a wider range of cohesive devices across paragraphs to strengthen explanation and organisation of ideas • manipulate sentence structures for clarity, precision and impact independently • use semi-colons, colons and dashes accurately within increasingly sustained scientific writing • organise writing into coherent sections using appropriate organisational features independently • edit and refine grammar and punctuation choices independently to improve meaning and effect • sustain increasingly sophisticated sentence structures appropriate to audience and purpose
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<p>Computing Integration</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> • use search technologies effectively to locate information linked to forces and movement • select and retrieve information from a range of digital sources • recognise that information found online may vary in reliability and accuracy • compare and evaluate information from different sources and identify evidence to support ideas • use digital tools to organise and present scientific learning and research • create digital presentations, fact files, investigation records, graphs or reports linked to forces • use multimedia elements such as images, audio, video and text to communicate understanding • develop keyboard, editing and formatting skills when producing written outcomes • use technology safely, respectfully and responsibly when researching and presenting information • understand the importance of evaluating sources and considering reliability when accessing information online • use digital tools to record observations, organise findings and present scientific evidence • communicate and collaborate appropriately through digital activities where relevant • use digital simulations and investigations where appropriate to explore scientific concepts and test ideas <p>Computational Thinking and Digital Creation</p> <ul style="list-style-type: none"> • identify patterns, test outcomes and record findings digitally using increasingly independent methods 	
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<p>Independence</p> <p>Pupils move from:</p> <ul style="list-style-type: none"> • identifying simple information from investigations and observations with adult support • using scientific vocabulary with prompts and scaffolds • recording ideas through supported discussion and structured activities 	<p>Thinking</p> <p>This unit develops:</p> <ul style="list-style-type: none"> • scientific enquiry and investigation skills • understanding of forces and movement • interpretation and evaluation of evidence • comparison and connection-making between scientific concepts and real-life experiences • reasoning and justification using evidence • questioning, discussion and reflective thinking
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<ul style="list-style-type: none"> • asking simple questions about scientific learning • interpreting observations and evidence with adult guidance • relying on models, sentence stems and visual prompts to organise ideas • participating in collaborative activities with adult support <p>To:</p> <ul style="list-style-type: none"> • independently retrieving and selecting relevant information from a range of scientific sources and investigations • using increasingly precise scientific and disciplinary vocabulary independently • asking scientifically valid questions and exploring ideas thoughtfully • interpreting evidence and making reasoned conclusions using scientific understanding • organising and communicating ideas confidently through spoken, practical and written outcomes • selecting appropriate methods to record and present learning independently • working collaboratively whilst taking increasing ownership of learning and decision-making <p>By the end of the unit pupils can:</p> <ul style="list-style-type: none"> • independently retrieve and apply learning from investigations and prior scientific knowledge • communicate understanding using scientific vocabulary accurately and appropriately • ask and answer scientific questions using evidence to justify thinking • organise ideas into coherent spoken and written outcomes with increasing independence • interpret and discuss information from different investigations and sources with growing confidence • identify patterns, relationships and connections within scientific learning • select appropriate strategies and resources to support learning independently • reflect on learning and explain understanding with increasing confidence and accuracy 	<ul style="list-style-type: none"> • critical thinking through analysis of observations, findings and results • communication and explanation using increasingly precise scientific vocabulary • curiosity, independence and problem-solving • understanding of how science helps explain and influence the world around us <p>Cognitive Progression</p> <p>Pupils progress from:</p> <ul style="list-style-type: none"> • identifying and recalling simple scientific facts • asking and answering straightforward questions • recognising similarities and differences • making simple observations during investigations and practical activities • explaining ideas with adult support <p>Towards:</p> <ul style="list-style-type: none"> • asking scientifically valid questions independently • interpreting evidence and identifying important information • making connections between causes, actions and effects within investigations • comparing results and identifying patterns and relationships • justifying ideas and conclusions using evidence • evaluating the reliability and usefulness of investigations and findings • applying prior knowledge to new contexts and scientific enquiries • communicating increasingly sophisticated explanations and scientific understanding
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<p>3 Lead Subjects National Curriculum Links</p> <p>Science</p> <p>Pupils learn to:</p> <ul style="list-style-type: none"> • plan different types of scientific enquiries to answer questions



- take measurements using scientific equipment with increasing accuracy and precision
- record data and results using scientific diagrams, labels, tables, scatter graphs, bar charts and line graphs
- use test results to make predictions and identify further questions
- report and present findings from enquiries using scientific explanations and evidence
- identify scientific evidence that supports or refutes ideas
- explain that unsupported objects fall towards the Earth because of gravity
- identify the effects of air resistance, water resistance and friction
- recognise that mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect

Year 5:

- explain that gravity acts between the Earth and objects
- identify the effects of friction, air resistance and water resistance
- recognise and investigate mechanisms including levers, pulleys and gears
- ask questions and investigate forces through practical enquiry

Year 6 extension:

- evaluate the reliability and accuracy of investigations and findings
- identify variables and explain their impact on outcomes
- justify scientific explanations using evidence from multiple investigations
- explain relationships and patterns independently
- explain how multiple forces can act simultaneously and influence movement
- use scientific models and representations to explain relationships and findings independently

Disciplinary Knowledge:

Pupils learn to think as scientists by:

- asking scientifically valid questions
- planning and carrying out investigations
- observing and measuring carefully
- interpreting and evaluating evidence
- identifying patterns and relationships
- using evidence to justify conclusions and explanations

Working Scientifically Focus

Pupils will develop scientific enquiry skills by:

- asking questions
- making predictions
- carrying out observations and investigations
- recording findings
- identifying patterns
- drawing conclusions using evidence
- evaluating outcomes where appropriate

Working Scientifically Focus

Pupils will:

- ask questions about forces and motion



- plan and carry out comparative investigations
- identify variables
- record measurements systematically
- identify patterns within results
- draw conclusions using evidence
- evaluate reliability of findings

Progression:

question → predict → investigate → observe → analyse → conclude → justify → evaluate

Secure End Point:

By the end of the unit pupils can:

- independently explain how forces affect movement
- identify patterns and relationships within investigations
- justify conclusions using increasingly sophisticated scientific evidence and disciplinary vocabulary

English

Pupils learn to:

- read and discuss a broad range of fiction, non-fiction and scientific texts
- retrieve, record and present information from texts
- write for a range of audiences and purposes
- participate in discussion, debate and presentations

Year 5:

- retrieve information and justify responses using evidence
- write explanations, investigations and comparative responses
- discuss themes and author choices within texts

Year 6 extension:

- evaluate author choices and viewpoints
- sustain writing for different purposes and audiences
- use increasingly sophisticated vocabulary and grammatical structures independently

Disciplinary Knowledge:

Pupils learn to think as readers and writers by:

- retrieving and interpreting information
- identifying important information and evidence
- evaluating language choices
- organising and communicating ideas effectively

Secure End Point:

By the end of the unit pupils can:



- communicate understanding through spoken and written outcomes
- justify ideas using evidence from reading and discussion
- write coherent scientific outcomes for different audiences and purposes

Area	Coverage within this unit
Reading	Reading and discussing a range of fiction, scientific texts, information texts and investigation materials linked to forces; retrieving and recording information; developing inference skills; identifying key information; using evidence to justify thinking; disciplinary reading as scientists; developing ambitious scientific vocabulary and fluency through oral reading and discussion
Writing	Writing explanation texts, investigation reports, balanced arguments, diary entries, persuasive responses and scientific narratives; planning, drafting, editing and evaluating writing for different audiences and purposes; using evidence to support ideas and scientific explanations
Spelling	Applying Year 5 and Year 6 statutory spelling expectations; using prefixes and suffixes; applying spelling patterns and rules taught through the school spelling programme; accurately spelling topic vocabulary including scientific and disciplinary language
Grammar and Punctuation	Using expanded noun phrases, relative clauses, modal verbs, fronted adverbials, parenthesis, cohesive devices, active and passive voice, formal and informal language, colons, semi-colons and punctuation accurately within increasingly sustained writing
Spoken Language / Oracy	Participating in discussions, debates, presentations, role-play and collaborative enquiry activities; explaining ideas clearly; asking scientifically valid questions; justifying opinions with evidence; presenting findings using appropriate vocabulary and register; developing fluency, prosody and confidence through oral rehearsal and performance opportunities

Computing

Pupils learn to:

- use search technologies effectively
- select and organise information from digital sources
- create and present content using digital tools
- use technology safely and responsibly

Year 5:

- retrieve and organise information from different digital sources
- use digital tools to create presentations, investigation records and information texts

Year 6 extension:

- evaluate the reliability and accuracy of online information
- compare multiple sources and justify decisions about usefulness

Disciplinary Knowledge:

Pupils learn to think as digital users by:

- selecting appropriate technology for purpose
- evaluating information critically
- presenting ideas effectively using digital tools

Secure End Point:



By the end of the unit pupils can:

- independently research information using appropriate digital tools
- identify trustworthy information sources
- communicate learning through purposeful digital outcomes

Application Subjects

Subject: Mathematics

Core Knowledge

Pupils develop understanding of how mathematical skills support scientific enquiry through measuring, recording, comparing and interpreting findings. Pupils apply mathematical thinking to investigate forces, movement and patterns within scientific investigations.

Examples of application within this unit may include:

- measuring distance, time and movement outcomes during investigations
- organising findings using tables, charts and graphs
- comparing results and identifying patterns
- calculating averages and interpreting data where appropriate
- using mathematical language to explain observations and findings

Expected outcomes may include:

- investigation tables
- graphs and charts
- comparative findings
- mathematical reasoning linked to scientific enquiry

Subject: Computing

Core Knowledge

Pupils develop understanding of how technology supports scientific investigation, communication and presentation of learning. Pupils use digital tools to research, organise information and communicate findings linked to forces and movement.

Examples of application within this unit may include:

- researching forces using digital sources
- creating investigation records and presentations
- recording findings digitally
- using graphs and multimedia tools
- evaluating reliability of information

Expected outcomes may include:

- presentations
- digital investigation reports
- videos
- podcasts
- graphs and scientific explanations



Subject: Design and Technology

Core Knowledge

Pupils develop understanding of how design and technology support problem-solving and purposeful creation. Pupils apply understanding of forces and mechanisms to design and create outcomes linked to movement.

Examples of application within this unit may include:

- designing and testing parachutes
- creating pulley systems
- constructing ramps and vehicles
- designing catapult mechanisms
- planning and improving engineering challenges

Expected outcomes may include:

- parachute investigations
- pulley systems
- vehicle designs
- marble runs
- model engineering outcomes

Year 5

- investigate how mechanisms and movement work
- create products involving movement (sliders, levers or simple mechanisms)
- test how movement affects outcomes

Year 6 Extension

- modify designs following testing
- explain how forces influence function

Secure end point

Pupils independently create and refine products using movement and simple mechanisms.

Subject: Music

Core Knowledge

Pupils develop understanding of how sound is created through vibration and how music can communicate movement, speed and force. Pupils use rhythm, sound and performance to explore scientific ideas linked to forces.

Examples of application within this unit may include:

- investigating vibration through instruments and sound sources
- creating rhythmic patterns representing movement and speed
- exploring pitch and volume changes linked to force
- composing soundscapes inspired by movement or forces
- discussing how sound changes when forces change



Expected outcomes may include:

- sound investigations
- rhythmic compositions
- movement soundscapes
- collaborative performances

Musical Understanding and Performance

- investigate how rhythm, pulse and dynamics can represent movement, force and change

English Progression and National Curriculum Links

Reading

Pupils develop:

- increasing fluency and stamina when reading a range of increasingly complex texts
- retrieval, inference and prediction skills using evidence from texts
- understanding and discussion of themes, vocabulary and author choices
- comparison of ideas, viewpoints and information across texts
- disciplinary reading skills through scientific texts, investigation materials and information sources
- confidence in discussing and justifying opinions using evidence

Writing

Pupils develop:

- planning and organising ideas for different audiences and purposes
- writing narratives, explanations, information texts, persuasive writing and comparative responses
- selecting vocabulary and grammatical structures appropriate for purpose
- using evidence to support explanations and ideas
- drafting, editing and improving writing independently

Spelling

Pupils develop:

- application of Year 5 and Year 6 statutory spelling expectations
- accurate use of topic vocabulary within spoken and written outcomes
- understanding of spelling patterns, prefixes and suffixes
- independent editing and proofreading skills

Grammar and Punctuation

Pupils develop:

- use of relative clauses and expanded noun phrases
- use of cohesive devices across paragraphs
- use of modal verbs and adverbials
- use of active and passive voice
- use of formal and informal language appropriately



- use of punctuation including brackets, commas, colons, semi-colons and dashes accurately

Spoken Language / Oracy

Pupils develop:

- discussion and debate skills
- asking and responding to questions thoughtfully
- presenting information confidently
- justifying opinions using evidence
- adapting language and vocabulary for audience and purpose
- developing fluency, expression and confidence through oral rehearsal and presentation opportunities

Progression

retrieve → infer → interpret → justify → evaluate → communicate independently

Secure End Point

Pupils independently communicate understanding through a range of spoken and written outcomes using evidence, ambitious vocabulary and increasingly sophisticated language structures.

Future Learning (English)

This unit prepares pupils for future learning by supporting them to:

- read increasingly challenging fiction, non-fiction and disciplinary texts confidently
- interpret themes, viewpoints and evidence across a wider range of texts
- write for increasingly sophisticated purposes and audiences
- organise and sustain extended writing independently
- evaluate language, author choices and viewpoints critically
- communicate ideas confidently through discussion, debate and presentation
- apply reading and writing skills across the wider curriculum
- access secondary curriculum demands requiring independent reading, analysis and communication
- develop confidence as fluent readers, writers and communicators across subjects
- analyse increasingly complex scientific explanations, evidence and source material independently

Curriculum Progression and National Curriculum Links

Lead Subject: Science

National Curriculum Links

Pupils learn to:

- plan different types of scientific enquiries to answer questions
- take measurements using scientific equipment with increasing accuracy and precision
- record data and results using scientific diagrams, labels, tables, scatter graphs, bar charts and line graphs
- use test results to make predictions and identify further questions
- report and present findings from enquiries using scientific explanations and evidence
- identify scientific evidence that supports or refutes ideas
- 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 acting between moving surfaces
- recognise that mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect

Year 5

- explain that gravity acts between the Earth and objects
- identify the effects of friction, air resistance and water resistance
- investigate forces through practical enquiry and observation
- recognise mechanisms including levers, pulleys and gears and explain their purpose

Year 6 Extension

- evaluate the reliability and usefulness of scientific evidence
- justify scientific explanations using evidence from multiple investigations
- identify variables and explain their influence on outcomes
- analyse patterns and relationships independently

Curriculum Progression

observe → measure → identify patterns → interpret → justify → evaluate

Secure End Point

Pupils independently explain the effects of forces and use evidence confidently to justify scientific conclusions and explanations.

Lead Subject: English

National Curriculum Links

Pupils learn to:

- read and discuss a broad range of fiction, non-fiction and scientific texts
- retrieve, record and present information from reading
- increase familiarity with increasingly challenging texts and disciplinary reading materials
- write for a range of purposes and audiences
- participate in discussions, presentations and debate

Year 5

- retrieve and justify responses using evidence from texts
- write explanations, investigation reports and comparative responses
- discuss themes, vocabulary and author choices
- organise writing into coherent paragraphs

Year 6 Extension

- evaluate author choices and viewpoints independently
- sustain writing for different audiences and purposes
- use increasingly sophisticated vocabulary and grammatical structures
- justify opinions and interpretations using evidence confidently

Curriculum Progression



retrieve → infer → interpret → justify → evaluate → communicate independently

Secure End Point

Pupils independently communicate understanding through increasingly sophisticated spoken and written outcomes using evidence and ambitious vocabulary.

Lead Subject: Computing

National Curriculum Links

Pupils learn to:

- use search technologies effectively
- select, use and combine software to create digital outcomes
- understand how information online may vary in reliability
- use technology safely, respectfully and responsibly

Year 5

- use digital tools to research forces and movement
- create presentations and digital outcomes
- organise information effectively
- use technology safely and appropriately

Year 6 Extension

- evaluate the reliability and usefulness of online sources
- select digital tools independently according to purpose
- communicate information effectively through a range of media
- evaluate and improve digital outcomes independently

Curriculum Progression

find → organise → create → communicate → evaluate

Secure End Point

Pupils independently use technology to research, create and communicate purposeful outcomes linked to scientific enquiry and understanding.

Application Subject Progression and National Curriculum Links

Subject: Mathematics

National Curriculum Links

Pupils learn to:

- solve problems involving number, measurement and interpretation of data
- use mathematical reasoning to explain and justify thinking
- interpret information presented in tables, charts and diagrams



- use mathematical knowledge to support learning across the curriculum

Year 5

- measure and compare distances, time and outcomes linked to investigations
- organise findings using tables, charts and diagrams
- identify patterns and relationships within investigations
- use mathematical language to discuss findings and observations

Year 6 Extension

- analyse and interpret patterns and relationships independently
- compare information and justify conclusions using evidence
- present findings using increasingly sophisticated representations
- explain mathematical reasoning confidently

Disciplinary Knowledge

Pupils work as mathematicians by:

- measuring and calculating
- organising findings
- identifying patterns
- comparing information
- reasoning mathematically
- explaining conclusions

Disciplinary Progression

measure → compare → identify patterns → interpret → explain

Secure End Point

Pupils independently apply mathematical skills to organise and interpret scientific findings and explain patterns confidently.

Subject: Computing

National Curriculum Links

Pupils learn to:

- use search technologies effectively
- select, use and combine software to create outcomes
- understand how information found online may vary in reliability
- use technology safely, respectfully and responsibly

Year 5

- use digital tools to research forces and movement
- organise and present information digitally
- create purposeful presentations and outcomes
- communicate ideas using technology



Year 6 Extension

- evaluate reliability and usefulness of online sources independently
- select appropriate digital tools according to purpose
- communicate information effectively through a range of media
- evaluate and improve digital outcomes

Disciplinary Knowledge

Pupils work as digital creators by:

- finding information
- organising ideas
- creating outcomes
- communicating information
- evaluating effectiveness

Disciplinary Progression

find → organise → create → communicate → evaluate

Secure End Point

Pupils independently use technology to research, create and communicate purposeful outcomes linked to scientific enquiry and understanding.

Subject: Music

National Curriculum Links

Pupils learn to:

- play and perform in solo and ensemble contexts using voice and instruments
- improvise and compose music for different purposes using the inter-related dimensions of music
- listen with attention to detail and recall sounds with increasing aural memory
- use and understand musical elements including pitch, duration, dynamics, tempo, timbre, texture and structure
- appreciate and understand a range of musical traditions and styles
- develop understanding of how music communicates ideas, movement, emotion and meaning

Year 5

- explore how vibration creates sound and how forces can influence sound production
- identify rhythm, pulse and patterns within musical activities and sound investigations
- investigate how changes in force can alter volume, pitch and movement within sound experiences
- use voice, percussion and instruments to communicate movement and scientific ideas

Year 6 Extension

- evaluate how changes in sound and musical elements influence meaning and audience response independently
- create increasingly purposeful compositions representing movement, speed, forces or scientific concepts
- justify musical decisions using increasingly precise musical vocabulary
- refine, adapt and improve performances following evaluation and feedback independently



Disciplinary Knowledge

Pupils work as musicians by:

- listening carefully
- exploring sound and rhythm
- investigating vibration and movement in sound
- composing musical ideas
- performing collaboratively
- evaluating effectiveness
- improving outcomes

Disciplinary Progression

listen → explore → investigate → compose → perform → evaluate → improve

Secure End Point

Pupils independently use sound, rhythm and performance to communicate scientific understanding linked to forces and movement whilst explaining and evaluating musical choices confidently.

Cross-curricular Links

Subject	Cross-curricular links within this unit
English	Reading scientific texts, information sources and investigation materials linked to forces and movement; writing explanation texts, investigation reports, diary entries, balanced arguments and persuasive responses
Mathematics	Measuring distance, time and outcomes; collecting and interpreting data; organising findings through charts, tables and graphs; identifying patterns and relationships
Computing	Researching forces using digital tools; creating presentations and digital outcomes; recording findings and evaluating online information and source reliability
Design and Technology	Designing and creating models linked to mechanisms including levers, pulleys and gears; planning, creating, testing and evaluating purposeful products
Physical Education	Exploring movement, speed, balance and forces acting upon the body during physical activity and sport; discussing how forces influence movement and performance
Geography	Exploring how forces affect the natural world including gravity, water movement and environmental processes where appropriate
PSHE	Developing resilience, teamwork, communication and problem-solving through practical investigations and collaborative activities; reflecting on perseverance and learning behaviours
Spoken Language / Oracy	Participating in discussion, presentations, collaborative investigations and scientific enquiry activities; justifying ideas and communicating explanations clearly
Reading Across the Curriculum	Developing disciplinary reading skills through scientific explanations, investigation texts, diagrams, biographies of scientists and non-fiction texts
Art and Design	Creating diagrams, observational sketches and visual representations linked to movement, mechanisms and scientific ideas

Substantive Knowledge Sequence

Week	Substantive Knowledge Sequence
Week 1 - Introducing Forces and Gravity	Pupils learn that forces are pushes and pulls that can affect movement, direction and shape. Pupils learn that unsupported objects fall towards the Earth because of gravity



	acting between the Earth and objects, develop key vocabulary linked to forces and discuss where forces can be observed in everyday life.
Week 2 - Friction and Movement	Pupils learn that friction is a force acting between surfaces, friction can slow movement and different surfaces create different amounts of friction. Pupils investigate how friction affects movement and understand that forces can have helpful and unhelpful effects. Pupils learn that changing one variable can affect outcomes and that fair tests help scientists identify reliable evidence.
Week 3 - Air Resistance	Pupils learn that air resistance is a force acting against moving objects in air, different shapes and surfaces affect air resistance and forces can influence speed and movement. Pupils investigate how design can change the effects of air resistance. Pupils identify and control variables during investigations.
Week 4 - Water Resistance	Pupils learn that water resistance acts against objects moving through water, different shapes and designs influence movement through water and forces can affect efficiency and speed. Pupils investigate how design choices can change outcomes.
Week 5 - Mechanisms: Levers, Pulleys and Gears	Pupils learn that mechanisms including levers, pulleys and gears can allow a smaller force to have a greater effect. Pupils explore how mechanisms are used in everyday life and understand that engineers use scientific knowledge to solve problems. Pupils consider how changing variables alters outcomes. Pupils learn that multiple forces can act upon objects simultaneously, forces can combine to influence movement and scientists use models and representations to explain relationships between forces and outcomes.
Week 6 - Scientific Enquiry and Investigation Outcome	Pupils learn that evidence helps scientists explain ideas, investigations can produce different findings and scientific understanding is developed through testing, observation and interpretation of evidence. Pupils use scientific evidence to justify explanations and conclusions.

National Curriculum Coverage Audit

Subject	National Curriculum Coverage within this Unit
Science	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 acting between moving surfaces; recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect; plan scientific enquiries; take measurements and record data accurately; report findings using scientific evidence and explanations
English	develop positive attitudes to reading and understanding increasingly challenging texts; discuss words and phrases that capture meaning; identify themes and conventions across a range of texts; draw inferences and justify responses using evidence; organise ideas into paragraphs around a theme; use increasingly varied vocabulary and sentence structures; participate in discussions, presentations and debate
Design and Technology	generate, develop and communicate ideas through discussion and design criteria; investigate and evaluate products; select and use materials and tools appropriately; apply understanding of mechanisms; evaluate and improve designs and outcomes
Mathematics	measure, compare and interpret information; identify patterns and relationships; apply mathematical reasoning and problem-solving skills through measurement, data collection, investigations and interpretation of findings
ICT	use technology purposefully to create, organise and present information; develop understanding of digital communication; select and use software effectively; understand how information found online may vary in reliability; use technology safely and responsibly
Physical Education	develop coordination, movement and control; apply understanding of movement and performance; explore how movement and forces affect physical activity and sport
Personal Development and Learning	develop self-awareness and emotional understanding; build positive relationships and communication skills; develop resilience and teamwork; reflect on learning behaviours, problem-solving and perseverance; participate positively within collaborative learning experiences



<p>Anchor Texts:</p> <ul style="list-style-type: none"> • Why Doesn't the Moon Fall Down? • Cosmic • How was that built? <p>Supporting texts/recommended reads:</p> <ul style="list-style-type: none"> • Forces and Magnets • How Machines Work • Comic Strip Science: Physics • See Inside Inventions • The Goldfish Boy • Question Everything! • Brightstorm 	<p>Reading Focus:</p> <ul style="list-style-type: none"> • scientific enquiry and investigation • evidence collection and interpretation • explanation and understanding of scientific concepts • comparison of observations, findings and results • disciplinary reading as scientists • inference from scientific texts and investigation materials • ambitious scientific vocabulary • author viewpoint and reliability • prediction and reasoning using evidence • interpreting diagrams, charts and scientific representations • questioning and discussion linked to scientific understanding
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Disciplinary Reading Opportunities

- scientific investigation texts
- biographies of significant scientists, inventors and engineers
- information texts
- diagrams, tables and scientific representations
- explanation texts
- scientific reports and findings
- digital and multimedia sources
- scientific viewpoints and interpretations

Genre Coverage

Genre	Coverage
Scientific fiction	Exploring narratives and stories linked to inventions, engineering and scientific ideas
Information texts	Reading scientific non-fiction texts, reports, fact files and reference materials linked to forces and movement
Explanation texts	Understanding and creating texts explaining gravity, friction, air resistance, water resistance and mechanisms
Persuasive texts	Exploring and creating persuasive responses linked to scientific viewpoints and enquiry questions
Balanced argument / Discussion texts	Considering different perspectives and evaluating scientific questions and findings
Biography	Reading biographies and information about significant scientists, engineers and inventors



Poetry	Exploring performance poetry and spoken language opportunities linked to movement, engineering and scientific ideas where appropriate
Scientific sources / Disciplinary reading	Interpreting diagrams, observations, scientific evidence and investigation materials to support scientific enquiry
Spoken presentation	Investigation presentations, debates, demonstrations and collaborative discussion activities

Reading Progression Audit

Area	Progression within this Unit
Vocabulary development	Pupils progress from understanding and using familiar scientific vocabulary to applying increasingly ambitious disciplinary language including <i>gravity, friction, mechanism, resistance, evidence</i> and <i>variable</i> independently
Fluency and stamina	Pupils develop increasing fluency and confidence when reading longer and more complex scientific texts and investigation materials; sustained reading opportunities support increasing reading stamina
Retrieval	Pupils progress from locating explicit information to independently retrieving and selecting relevant evidence from a range of scientific texts and investigation materials
Inference	Pupils progress from making simple inferences to justifying ideas and scientific explanations using evidence from texts, investigations and discussion
Author intent and viewpoint	Pupils develop understanding that scientific texts and sources may present information differently and begin to evaluate author choices and reliability
Scientific disciplinary reading	Pupils work increasingly as scientists by interpreting diagrams, observations, investigations and evidence to construct understanding
Comparison across texts	Pupils compare ideas, explanations and information across scientific texts and investigation materials
Discussion and response	Pupils progress from supported responses to independently discussing, questioning and justifying opinions using evidence
Reading across genres	Pupils access increasingly varied genres including scientific fiction, biographies, information texts, explanation texts and investigation materials
Reading for purpose	Pupils increasingly understand that reading supports enquiry, knowledge-building and understanding across the wider curriculum

Reading Spine Links

Reading Spine Unit: Forces in Action (UKS2)

Reading focus areas:

- scientific enquiry and investigation



- explanation and interpretation of scientific concepts
- retrieval and interpretation from scientific and non-fiction texts
- comparison of findings and evidence
- ambitious scientific and disciplinary vocabulary
- discussion, questioning and scientific reasoning

Fluency approaches:

- reader's theatre
- performance reading
- oral rehearsal before writing
- guided group reading aloud
- choral reading of scientific texts and explanations
- echo reading for scientific vocabulary
- storytelling and role-play
- investigation discussion and collaborative tasks
- partner explanation and discussion

Retrieval focus:

- recalling key vocabulary and scientific concepts
- retrieving information from fiction, non-fiction and scientific texts
- identifying evidence from investigations, diagrams and observations
- using evidence to explain ideas and scientific understanding
- comparing forces, mechanisms and findings

Reading Spine Impact

The Reading Spine is intentionally designed to ensure pupils experience:

- scientific fiction and non-fiction texts
- increasingly ambitious scientific and disciplinary vocabulary
- opportunities for retrieval, inference and interpretation
- exposure to scientific evidence and enquiry-based discussion
- opportunities to compare findings and justify ideas using evidence
- increasingly sophisticated reading, discussion and critical thinking skills
- meaningful opportunities to develop fluency, comprehension and scientific understanding through reading across the curriculum

Vocabulary Development

Key vocabulary is revisited through oral rehearsal, discussion, retrieval practice and repeated shared reading experiences.

Tiered Vocabulary:

Tier 1: force, push, pull, move, object, fall, speed, surface, air, water

Tier 2: gravity, friction, resistance, mechanism, prediction, investigation, evidence, observe, compare, explanation



Tier 3: gravity force, air resistance, water resistance, frictional force, mechanism, lever, pulley, gear, variable, fair test, scientific enquiry, hypothesis, conclusion, force meter, Newton, data, accuracy

Oracy & Fluency:

- echo reading for scientific and disciplinary vocabulary
- paired reading
- oral storytelling linked to forces, movement and scientific concepts
- performance reading
- discussion circles
- reader’s theatre
- storytelling and role-play (*e.g. scientist, engineer, inventor, investigator, presenter*)
- guided group reading aloud
- partner explanation and evidence talk
- questioning and scientific enquiry discussion
- collaborative interpretation of investigations, diagrams, data and scientific representations
- explanation and justification using scientific evidence
- debate and persuasive discussion (*e.g. Which force has the greatest impact on movement?*)
- presentation and investigation showcase activities
- oral rehearsal before writing and discussion tasks
- collaborative problem-solving and engineering challenge discussions
- prediction and reasoning talk linked to investigations and practical activities

SEMH Reading Approach:

Texts are selected to provide emotional safety, opportunities for curiosity, strong relational themes and meaningful discussion to support regulation, belonging and confidence. Scientific learning is carefully scaffolded through visual supports, explicit vocabulary teaching, repeated reading opportunities and practical experiences to reduce cognitive load and support access to ambitious learning. Reading experiences are designed to build curiosity, encourage scientific enquiry and develop confidence without reducing curriculum expectations.

Reading experiences are designed to:

- build curiosity through scientific investigation, stories and practical exploration
- provide opportunities for repeated reading and oral rehearsal to strengthen fluency and confidence
- use diagrams, images, investigations, practical resources and visual prompts to support understanding
- encourage discussion and exploration before recording ideas
- strengthen comprehension through retrieval, prediction, inference and interpretation of evidence
- provide structured opportunities for success and positive participation
- develop confidence in communicating ideas without reducing curriculum expectations
- promote belonging, confidence and positive reading identities through meaningful and engaging texts
- support pupils to explore different viewpoints, discoveries and scientific ideas through discussion and enquiry
- develop critical thinking, problem-solving and understanding through carefully selected texts and scientific themes
- provide practical experiences and collaborative investigations to strengthen engagement and reduce cognitive load
- encourage pupils to explain ideas, test predictions and justify thinking using scientific evidence

Visits and Visitors:



Visits and visitors are used to:

- deepen understanding of forces and movement through first-hand and meaningful experiences
- provide opportunities for scientific enquiry and investigation
- develop curiosity through practical experiences, demonstrations and expert knowledge
- strengthen understanding of scientific evidence and interpretation
- provide opportunities for discussion, questioning and collaborative learning
- develop understanding of how science influences everyday life and technological developments
- support vocabulary development and disciplinary understanding through authentic experiences
- strengthen confidence, communication and engagement through memorable learning opportunities
- create opportunities for pupils to make connections between scientific learning and the world around them
- promote belonging and positive learning experiences through engaging and accessible activities

Possible visits and visitors may include:

- science museums or interactive STEM exhibitions
- virtual science experiences and engineering workshops
- scientists, engineers or STEM professionals
- practical investigation and engineering challenge workshops
- sports visitors exploring movement, speed and forces in action
- inventors or technology specialists discussing real-life applications of forces
- outdoor learning activities investigating movement, gravity and resistance
- local educational visits supporting scientific investigation and enquiry
- design and technology workshops linked to mechanisms including levers, pulleys and gears
- hands-on STEM challenge experiences and collaborative problem-solving activities

Home Learning:

- family discussion prompt linked to forces, movement or everyday experiences of forces (*e.g. Where do we see forces at work? How do forces affect sport, transport or movement?*)
- simple creative activity to reinforce retrieval (*e.g. design a parachute, create a labelled force diagram, design a pulley system, create a force poster or build a simple mechanism model*)
- optional object, photograph, drawing or spoken contribution to bring back and share with the class
- short reading, storytelling or discussion activity linked to anchor or supporting texts
- comparison and observation activity (*e.g. compare movement on different surfaces, compare objects affected by air resistance or compare different mechanisms used in everyday life*)
- vocabulary retrieval activities using key scientific and disciplinary vocabulary
- research task linked to a scientific question (*e.g. Why do objects fall to the Earth? How*

Home Reading Opportunities:

Families are encouraged to revisit key texts together, practise repeated reading and discuss scientific themes, vocabulary and ideas. Opportunities for discussion should support curiosity, questioning and understanding of forces and how they influence the world around us.

Topics for discussion may include:

- gravity and why objects move or fall
- friction and how surfaces affect movement
- air resistance and water resistance in everyday life
- mechanisms including levers, pulleys and gears
- inventions, engineering and how science solves problems
- scientific investigations and evidence
- questions about how forces affect everyday experiences such as transport, sport and technology
- similarities and differences between natural and human-made applications of forces
- how scientific discoveries and ideas influence the modern world



does friction affect movement? or How do mechanisms make work easier?)

Assessment Opportunities:

Assessment information is used to identify barriers, inform adaptive teaching and ensure pupils receive timely support and challenge.

Assessment Area	Assessment Opportunities within this Unit
Scientific knowledge	Retrieval quizzes, vocabulary checks and discussion tasks linked to gravity, friction, air resistance, water resistance and mechanisms
Scientific enquiry	Observation of questioning, prediction, investigation planning, evidence gathering and enquiry activities
Reading	Retrieval, inference and interpretation activities linked to scientific texts, information sources and investigation materials
Writing	Investigation reports, explanations, diary entries, balanced arguments, persuasive writing and extended written outcomes
Vocabulary development	Oral rehearsal, vocabulary retrieval activities, discussion and independent application within written outcomes
Spoken language / Oracy	Discussion, debate, presentations, role-play and explanation of ideas using scientific vocabulary
Scientific interpretation	Investigation analysis activities, comparison of findings and justification using evidence
Independence	Observation of independent application, organisation of ideas, selection of strategies and participation in enquiry tasks
Final outcome	Forces Investigation Showcase, presentations or scientific enquiry outcomes demonstrating substantive knowledge and disciplinary understanding
Pupil voice and reflection	Discussion, self-reflection and evaluation of learning, understanding and confidence

Assessment Checkpoints

Teachers monitor whether pupils can:

Knowledge

- identify different types of forces and explain how they affect movement
- recall vocabulary linked to gravity, friction, air resistance and forces
- explain how forces act on objects in different situations



Disciplinary Thinking

- ask scientific questions and plan investigations
- identify patterns and relationships within observations and results
- draw conclusions and justify findings using evidence

Application

- communicate findings through spoken, practical and written outcomes
- explain ideas using scientific vocabulary accurately
- apply learning independently within the final outcome

Leaders Monitor Impact Through:

- pupil voice discussions
- work scrutiny
- retrieval quizzes
- vocabulary use in discussion and writing
- lesson visits
- assessment information
- final outcomes and presentations
- reading fluency checks
- pupil discussion linked to anchor texts
- Reading Spine progression reviews
- monitoring use of ambitious scientific and disciplinary vocabulary in reading and writing
- monitoring interpretation and use of scientific evidence within discussion and written outcomes
- monitoring application of scientific enquiry, investigation and critical thinking skills across learning outcomes
- monitoring pupils' ability to justify scientific explanations and communicate understanding using evidence
- monitoring understanding of forces, movement and relationships between scientific concepts
- monitoring pupils' ability to ask scientifically valid questions and apply disciplinary thinking
- monitoring engagement, confidence and participation within discussion, investigations and collaborative enquiry activities
- monitoring independent application of scientific knowledge and skills across outcomes
- monitoring pupils' ability to identify patterns, interpret findings and explain conclusions accurately
- monitoring use of practical investigation skills and application of scientific methods during enquiry activities

Links to Whole-School Policies

This unit should be delivered in line with:

- Curriculum Policy
- Teaching and Learning Policy
- Reading Policy / Reading Spine
- Behaviour and Relationships Policy
- SEND Policy
- Assessment Policy
- Equality and Accessibility Policy
- PSHE Policy
- Safeguarding Policy





Appendix 1: Year 5-6 National Curriculum Progression Overview

Area	Year 5	Year 6
Reading	Retrieve, infer and justify ideas from increasingly complex texts	Evaluate viewpoints, themes and author choices using evidence across texts
Vocabulary	Apply ambitious subject-specific vocabulary with support	Independently select precise disciplinary vocabulary for purpose
Writing	Write for a range of audiences and purposes using appropriate structures	Sustain and adapt writing independently for different audiences and purposes
Grammar & punctuation	Apply Y5 grammar structures appropriately	Manipulate structures purposefully for effect and precision
Spoken language	Participate in discussion and justify viewpoints	Lead discussion, challenge ideas respectfully and communicate confidently
Historical thinking	Use evidence and chronology to explain events	Evaluate interpretations and analyse reliability of evidence
Scientific enquiry	Plan investigations and identify patterns	Evaluate evidence, justify conclusions and explain variables
Geographical thinking	Use maps and evidence to explain places and environments	Evaluate relationships between people, environments and change
Religious / reflective thinking	Compare beliefs and viewpoints respectfully	Interpret meaning and justify perspectives using evidence
Computing	Select and use digital tools appropriately	Evaluate sources and select technologies purposefully
Creative thinking	Generate ideas and explain choices	Refine, evaluate and justify creative decisions independently
Independence	Select resources with support	Plan, organise and evaluate learning independently

Appendix 2: Year 5-6 Disciplinary Knowledge Progression

Subject Discipline	Year 5 pupils increasingly learn to...	Year 6 pupils increasingly learn to...
Historian	identify evidence, chronology and cause	evaluate interpretations and justify conclusions
Scientist	observe, investigate and identify patterns	evaluate evidence and explain findings critically
Geographer	identify patterns and relationships between places	explain interdependence and evaluate geographical issues



Environmental Investigator	recognise connections within ecosystems	evaluate human impact and sustainability issues
Reflective Thinker	compare beliefs, values and experiences	interpret viewpoints and justify perspectives
Reader	retrieve, infer and discuss themes	evaluate viewpoints and author intent
Writer	organise ideas for purpose and audience	manipulate language and structure deliberately
Artist / Designer	explore and create using techniques	refine and justify artistic decisions
Musician	create and perform using musical elements	evaluate and improve compositions independently
Health Investigator	identify factors affecting wellbeing	evaluate choices and explain impacts on wellbeing
Digital Creator	locate and organise information	evaluate reliability and create purposeful outcomes

Appendix 3 - Reading Spine Progression Across UKS2

Purpose

The Storyybrook Reading Spine is designed to ensure pupils experience a broad and ambitious range of high-quality texts that progressively develop reading fluency, vocabulary, comprehension, disciplinary thinking and understanding of the wider world. Texts are carefully selected to provide emotional safety, opportunities for discussion and increasing challenge whilst maintaining high expectations for all learners.

The Reading Spine supports pupils to:

- develop fluency, stamina and confidence as readers
- encounter increasingly ambitious vocabulary and language structures
- experience a wide range of authors, themes, cultures and perspectives
- strengthen retrieval, inference and interpretation skills
- develop disciplinary reading across subjects
- communicate ideas confidently through discussion and writing
- develop empathy, curiosity and understanding of the wider world
- access increasingly sophisticated texts and ideas in preparation for secondary education

Reading Progression Across UKS2

Area	Year 5	Year 6
Vocabulary development	Understand and apply ambitious vocabulary within discussion and reading	Independently select and apply precise disciplinary and thematic vocabulary
Reading fluency	Read increasingly complex texts with developing confidence and expression	Sustain fluency, expression and stamina across extended texts



Area	Year 5	Year 6
Retrieval	Retrieve information and identify relevant evidence	Select and synthesise evidence across multiple sources
Inference	Infer meaning and justify responses using evidence	Evaluate interpretations and viewpoints critically
Author intent	Identify author choices and themes	Analyse author intent and evaluate impact
Comparison across texts	Compare themes, characters and experiences	Compare viewpoints, themes and interpretations critically
Disciplinary reading	Interpret information within subject contexts	Apply reading skills independently across subjects
Discussion and response	Explain ideas and justify opinions	Lead discussion and communicate increasingly sophisticated responses
Reading for purpose	Recognise how reading supports learning	Apply reading strategically to investigate, evaluate and communicate understanding

Text Progression Across UKS2

Pupils progressively experience:

- increasingly sophisticated narratives
- biographies and significant individuals
- poetry and performance texts
- explanation and information texts
- persuasive and discussion texts
- historical, scientific and geographical source materials
- disciplinary texts linked to wider curriculum learning
- texts presenting different viewpoints and perspectives
- increasingly complex themes including identity, belonging, resilience, responsibility, community and change

Fluency Progression Across UKS2

Fluency approaches are consistently revisited and strengthened through:

- echo reading
- choral reading
- guided reading aloud
- partner reading
- reader's theatre
- storytelling and role-play
- oral rehearsal before writing
- discussion and debate activities
- performance opportunities



Pupils progress from:

supported reading and oral rehearsal
↓
increasing expression and confidence
↓
independent fluency and purposeful communication

Disciplinary Reading Progression Across UKS2

Pupils increasingly learn to:

retrieve → infer → interpret → compare → justify → evaluate → communicate independently

Pupils move from:

- identifying information and themes
- discussing ideas and viewpoints
- interpreting meaning using evidence

Towards:

- evaluating viewpoints and evidence critically
- comparing interpretations across texts and subjects
- independently applying reading skills across the wider curriculum

Impact

By the end of UKS2 pupils demonstrate increasing confidence as readers who can:

- read with fluency, expression and stamina
- interpret increasingly complex texts and ideas
- justify thinking using evidence
- communicate understanding confidently
- apply reading skills across subjects
- use ambitious vocabulary independently
- think critically and reflect thoughtfully
- access secondary curriculum expectations with confidence

Appendix 4: Storybrook Implementation Notes

Adults say

Retrieval

- “What do you already remember?”
- “Can you tell me something from last lesson?”

Vocabulary

- “Can you use that word in a sentence?”
- “What does that word mean?”

Reasoning



- “What evidence supports your thinking?”
- “What makes you think that?”

Reflection

- “Has your thinking changed?”

Adults do

- regulate and prepare for learning
- explicitly model new learning
- pre-teach vocabulary
- use visuals and scaffolds
- chunk instructions
- provide oral rehearsal opportunities
- revisit prior learning through retrieval
- gradually remove support to build independence

Adults look for

Knowledge

- recall of sticky knowledge
- accurate vocabulary use
- application of prior learning

SEMH

- engagement
- regulation
- confidence
- participation

Independence

- reduced adult support
- ownership of learning
- increasing resilience