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TransformED

Northern Ireland Curriculum 2028

An entitlement to excellence and equity

Key Stage 1

Purpose of document

This document brings together the learning entitlements for each subject area within Key Stage 1. This is intended to provide practitioners (namely Key Stage 1 practitioners) with clarity on the subject content at this specific phase of education.

The document should not be read in isolation but seen as a part of the wider curriculum framework setting the foundations for future learning at Key Stage 2 and Key Stage 3.

All that is contained are the learning entitlements. The subject vision statements and the explanation of the subject categories are within the subject framework documents. Both the subject vision statements and the subject categories should be read in conjunction with this document.

Contents

Art and design

Key Stage statement

Art and design in Key Stage 1 supports pupils as they move from purposeful, exploratory play towards deliberate building of knowledge, skills and techniques. At this age, pupils develop greater control over the materials which they use and work in more purposeful ways. They express their ideas by making work from a range of starting points, including the real world, the work of other artists and their own imaginations. They develop a greater understanding of the visual world and build focus, confidence, independence and resilience.

Pupils develop a secure knowledge of the elements of line, shape, colour, pattern and texture and use this to create their own two- and three-dimensional artwork using a variety of materials. Looking at and taking inspiration from the work of other artists, craftworkers and designers, in a range of styles, and from a range of cultures and time periods (traditional, modern and contemporary) broadens their visual references, creative thinking, and strengthens their ability to reflect upon and evaluate their own work.

The making of art

Mark-making, drawing and painting

Pupils should learn to:

- use different materials to create intentional marks, lines, shapes and patterns (e.g. pencils, crayons, oil pastels, pens, rubbers, chalk and charcoal; tools such as different types and sizes of brush to apply and remove paint in different consistencies; appropriate papers and backgrounds)
- hold and control a pencil to make deliberate marks
- use drawing media with varying pressures to add tone, textured marks, smudging, detail and layers
- investigate creating texture by taking rubbings and impressions
- use different types of paint and load and control a brush using different consistencies of paint
- use contrasting brushstrokes to create marks, including using dilute paint to create a simple and a graded wash
- mix, use and apply primary and secondary colours

Printing

Pupils should learn to:

- print with simple printing blocks using materials such as potatoes, clay and polystyrene and make patterns by printing with natural and found objects (e.g. string, sponges and leaves)

3D media

Pupils should learn to:

- make sculptures from different materials (e.g. natural materials; construction materials such as paper, card and soft wire; malleable materials such as clay and dough; papier mâché)
- use their hands and tools to model, shape, roll, cut, stick and create textured and smooth decorative surfaces using malleable materials
- cut, manipulate and join materials with glue, string, wire and tape to create durable structures

Collage and textiles

Pupils should learn to:

- tear, cut and layer basic shapes to create collaged images using different materials (e.g. paper and cardboard, fabric, different tapes and glues; combined drawn, painted and collaged elements)
- use materials such as paper, string, wool and fabric to weave
- create a simple running stitch

The creative processes of art

Pupils should learn to:

- explore, observe and draw real things
- use sketchbooks to collect ideas, experiment, practise, test and compare techniques
- make choices about the materials and techniques that will best suit their ideas and discuss the choices they have made
- review and improve their work

The elements of art

Pupils should learn:

- to identify primary and secondary colours on a colour wheel, in objects and in works of art
- that colours can evoke different moods and emotions
- that line can be used to add shape, texture and pattern to an artwork
- about geometric and organic shapes, visual texture and symmetry and how these can be used in works of art (e.g. how Leonardo da Vinci used symmetry in his mural, *The Last Supper*; how Albrecht Dürer created the impression of the texture of fur in his painting *Young Hare*)
- to use subject-specific vocabulary to describe colour, line, shape, pattern and texture when discussing their own work and that of other artists (e.g. simplified shapes and earth colours used to paint animals in the cave art of Laas Geel in Somaliland; how Paul Klee used geometric shapes and tints and shades of blue and green in his painting *Three Houses*)

The history of art

Pupils should learn:

- about different roles in the art world, including artist, designer and architect
- that art, craft and design can be categorised by method/technique (e.g. drawing, painting, sculpture, architecture, photography and textiles) and by subject matter (e.g. portraits, landscapes, narrative art and still life)
- to identify and compare key features in the work of artists, craftworkers and designers, in different styles (e.g. depiction of character and personality in the self-portraits of Vincent van Gogh, and portraits of Pablo Picasso and Colin Davidson; use of simplified shapes and colour in the paintings of Paul Henry and William Scott; use of line, shape and symmetry in the Parthenon and in buildings designed by Antoni Gaudí)
- that artists work from different starting points (e.g. from observation such as Giorgio Morandi's still life drawings, paintings and prints and Alma Thomas' paintings, inspired by nature; from their imagination such as Henri Matisse's cut-outs and the paintings of Mainie Jellett)

Digital technology

Key Stage statement

In Key Stage 1, digital technology shifts towards purposeful intent. Pupils develop an understanding of the logic of how tools function, focusing on the precision of input required for predictable results. They learn that systems consist of interconnected parts: inputs, a Central Processing Unit (CPU), and outputs.

Pupils develop technical fluency by choosing digital media files to reach an audience and mastering file management by saving their creations in logical folders. They apply these skills by using keywords to find information and following structured algorithms using sequence and selection. By navigating shared spaces, pupils see technology as a structured environment they can control. They learn that debugging is the process of fixing sequences to improve results. Digital tools are used to organise information, by using records to represent single objects or people.

As part of digital responsibility, pupils learn to protect their identity using private passwords and recognise that apps collect data to influence behaviour. Finally, they develop an awareness of how their use of technology and the lifecycle of digital devices can impact the environment.

Computing and digital systems

Pupils should learn that:

- digital representations are simplified versions of the real world, created by selecting the most important features of an object
- an algorithm is a sequenced set of instructions designed to solve a specific problem
- solutions can be developed using sequence (order) and selection (choices)
- block-based programs are logical sequences where inputs (triggers) produce specific, predictable outputs (results)
- a programmable robot follows a precise, ordered sequence of instructions
- debugging is the process of noticing when a sequence of instructions does not work and making changes to improve the result
- a collection of attributes (records in databases and rows in spreadsheets) represents one single person, place or thing

- a computer system consists of interconnected parts, each with a specific role: input devices (e.g. keyboards) capture data, the CPU processes the data, and output devices (e.g. monitors) communicate the results

Digital creation and communication

Pupils should learn:

- that digital products are built by combining various assets (e.g. graphics, text, audio, and interactive elements) which are designed and organised to meet the goals of the project
- that specific keys (e.g. Delete, Enter, Shift) act as commands to edit and structure digital text, while punctuation and special characters are symbols used to convey meaning
- that digital information can be found and retrieved efficiently by assigning meaningful filenames when saving and grouping content into logical folders
- to use digital tools to send and receive simple messages to respond to others and work together politely in a shared digital space

Digital ethics and responsibility

Pupils should learn that:

- passwords are a form of personal security information and must be kept private to protect their digital identity
- apps, games and websites collect data about individuals which may be used to sell products or influence behaviour
- some apps and games are designed with features that influence behaviour, such as longer use or in-app purchases
- the production and replacement of digital devices and associated components have an impact on the environment

English and drama

Key Stage statement

Pupils build upon secure foundations in decoding and encoding, gaining secure control of the alphabetic code while noticing how words, sounds and stories work together to create meaning. During Key Stage 1, core elements introduced in the Foundation Stage, including phonics, handwriting and sentence formation, should be practised to automaticity. Pupils build fluency by recognising and accurately applying patterns in sound, symbol and structure.

Pupils learn how words are formed, how sentences are structured, and how grammatical choices shape meaning. They learn about prefixes and suffixes, construct clear sentences, and use basic punctuation. They begin to use grammatical terms, choose precise vocabulary, and connect ideas using conjunctions to form compound and simple complex sentences.

They consolidate and extend awareness of sound patterns in spoken language in progressively more challenging contexts. They recognise how narratives sequence events, develop characters and shape outcomes, and begin to use these patterns when retelling and creating their own stories. Pupils begin to express preferences and give reasons for their views, participating in both exploratory and presentational talk. They learn to state simple opinions about texts and experiences and to support them with relevant examples or explanations. Pupils encounter figurative language through stories, talk and shared texts, meeting increasingly varied and challenging examples over time. They encounter shared story traditions and texts from beyond their immediate experience and begin to recognise that stories, poems and other texts come from different times, places and cultures.

Pattern

Sound and spoken language patterns

Primary 3

Pupils should:

- read aloud with increasing accuracy and prosody
- encounter, recognise and respond to patterns in sounds, including rhyme, alliteration and repeated phrases (e.g. 'lazy lions lounging' in *Animalia* by Graeme Base) in prose and poetry

Primary 4

Pupils should learn to:

- use sound patterning, such as onomatopoeia and alliteration, in their own talk and writing, imitating or taking inspiration from patterns in stories and poems (e.g. dramatic sounds of crash, clank, grind in *The Iron Man* by Ted Hughes; drip, drop, trickle, rush in *The Rhythm of the Rain* by Grahame Baker-Smith)

Word reading and transcription

Primary 3 and 4

Within a systematic phonics sequence, pupils should learn to:

- decode polysyllabic words and words that include less usual vowel sounds
- apply learned phonics knowledge when attempting to spell words
- read and write familiar patterns with increasing speed, accuracy and prosody
- increase the legibility, consistency and speed of handwriting towards greater fluency

Text patterns and early meaning

Primary 3 and 4

Pupils should:

- notice repeated words, phrases or events in texts and recognise that they help the reader follow the story (e.g. noticing different perspectives on the same events in *Voices in the Park* by Anthony Browne; the repeated structure with each crayon writing a letter in *The Day the Crayons Quit* by Drew Daywalt)
- talk about why a text might begin or end in a particular way
- use simple text structures to help retell or sequence events

Story

Primary 3

Pupils should learn:

- a range of familiar stories, fairy tales and traditional tales
- to retell a short story coherently, using increasingly precise language and varied sentence structures to clarify when events happen, how characters and settings are described, and why actions occur. This should include:

  - time connectives to signal sequence and duration (e.g. after, earlier, meanwhile, eventually, just at that moment, without warning)
  - expanded noun phrases to describe characters and settings (e.g. the very old grandmother; the brave woodcutter; the long, winding path)
  - adjectives chosen deliberately to create atmosphere (e.g. gloomy, towering, mysterious, gleaming)
  - conjunctions to explain cause, contrast and consequence (e.g. because, so, but, yet, and)
  - pronouns used accurately to avoid unnecessary repetition
  - dialogue used to reveal a character's thoughts, feelings or reactions rather than simply stating them
  - simple and compound sentences
- to recognise recurring narrative patterns such as journey, problem and resolution

Primary 4

Pupils should learn:

- to talk about characters' actions, feelings and motives
- that events in a story are connected
- to use plot points in their own storytelling, including problem or dilemma, build-up, climax and resolution
- about chapters in stories and stanzas in poetry
- to plan and write simple stories that are organised into clear paragraphs, establishing a setting, introducing characters and sequencing events logically from beginning to end. This should include:
  - adverbial phrases to show where and when events occur (e.g. on the edge of the forest, in the distance, under the cupboard, after he had stolen the eggs in *The Boy Who Grew Dragons* by Andy Shepherd)
  - adverbials to show how actions take place (e.g. creeping slowly, shaking with fear, carefully watching in *Varjak Paw* by S F Said)
  - varied sentence forms used deliberately for effect including statements, commands, questions and exclamations (e.g. commands: 'Don't be fooled!'; exclamations: 'What a ghastly pair!'; questions: rhetorical author voice in *The Twits* by Roald Dahl)

- about plot points in stories that they listen to or read, including problem or dilemma, build-up, climax and resolution (e.g. *The Hodgeheg* by Dick King-Smith, *The Boy Who Grew Dragons* by Andy Shepherd)
- to recognise similarities between different types of story by identifying shared features (e.g. character roles, settings, narrative patterns and recurring themes)

Argument

Primary 3

Pupils should learn to:

- give simple reasons for opinions about stories and characters, drawing on information from the text, using a range of conjunctions (e.g. because, but, so, while, although)
- read their own sentences aloud using a clear presentational voice
- listen and respond to others' ideas in discussion
- identify openings, elaboration points and conclusions in simple non-fiction texts

Primary 4

Pupils should learn to:

- write non-fiction texts with a clear introduction, elaborated points and a conclusion
- structure writing so that ideas build logically from one point to the next, rather than appearing as disconnected facts
- use headings and subheadings to organise content
- recognise the main features of simple reports, recounts and instructions
- plan and write simple reports, recounts and sets of instructions that explain how things work and why events occur, using clear logical reasoning (e.g. explain cause and effect)
- describe and elaborate sequences of events. Explanations should:
    - connect ideas clearly using prepositions and adverbials (e.g. in, above, below, under, beside, outside and through)
    - use time connectives to clarify sequence and duration (e.g. before, after, during, then, next, while, later, once and at the same time)
    - use causal language to explain why something happens (e.g. because, so, therefore, as a result, since and consequently)
- notice and begin to use simple persuasive techniques such as rhetorical questions and repetition

Metaphor

Primary 3

Pupils should learn:

- words with more than one related meaning, and that the intended meaning depends on context (e.g. *bright* can mean giving out a lot of light or intelligent; *field* can refer to a grassy area, an area of study or a playing surface; *light* can mean not heavy or not dark)
- that writers choose words deliberately to have an effect on a reader
- how words can make a reader feel or imagine something more clearly when a writer compares one thing to another to help the reader understand it (e.g. *The Tin Forest* by Helen Ward uses the junkyard to illustrate wasted life and forest growth to illustrate renewal; *Fog* by Carl Sandburg uses the metaphor of a cat to illustrate fog)
- to experiment with playful language in talk, including describing people, places or objects in imaginative ways

Primary 4

Pupils should learn:

- to notice and use simple similes for comparison
- to use descriptive vocabulary to extend meaning, including expanded noun phrases

Grammar

Primary 3

Pupils should learn:

- about prefixes and suffixes and how they change word meaning
- to recognise and construct simple sentences with clear meaning
- to use basic punctuation to mark sentences, including full stops, question marks and exclamation marks
- some commonly used synonyms and antonyms
- a range of speech verbs
- to use conjunctions to add, explain, contrast and sequence ideas
- to identify and write statements, questions, commands and exclamations

- to write compound and simple complex sentences using conjunctions (e.g. and, but, or, because, if and when)
- to maintain a consistent, appropriate tense in writing
- about pronouns and to notice who they refer to
- to use commas in lists
- to identify and use inverted commas for speech by a single character
- to practise sentence structures until they can be used fluently and accurately

Primary 4

Pupils should learn to:

- use commas after simple adverbial openers
- identify and start to use apostrophes for possession and contraction
- make purposeful grammatical choices in their own writing
- use grammatical terms such as noun and sentence to talk about language
- recognise and explain an independent clause
- use speech punctuation accurately
- choose between sentence types to make meaning clearer

Context

Primary 3 and 4

Pupils should learn:

- some traditional stories from different cultures (e.g. Aesop's Fables, Grimm's Fairy Tales) including stories from Northern Ireland
- that traditional stories are passed on and retold
- that stories reflect different places, times and communities, to learn examples of these (e.g. Arabian Nights, Greek myths, the Giant's Causeway story of Finn McCool) and to learn about their contexts
- to learn by heart and recite poems
- to share and perform stories and poems for an audience

Key Stage statement (drama)

In Key Stage 1, pupils move from playful exploration towards more purposeful dramatic activity. Pupils learn that drama involves both performing and watching. They begin to make deliberate choices about character, action and voice, and to understand that drama is created for an audience. Pupils learn that drama can take different forms and be created for different purposes. Practical work remains central, but it builds on the Foundation Stage by being increasingly shaped by simple conventions, shared stories and attentive reflection on what has been made and seen.

Making drama

Pupils should learn how to:

- explore emotions and show how actions, facial expression and movement can communicate a character's feelings
- work collaboratively in small groups to create simple performances based on familiar stories
- vary voice, movement and expression to suit different characters and situations
- improvise in role, responding to others while maintaining character
- interpret simple scripts or story outlines through performance

Different forms and genres

Pupils should learn:

- how to perform familiar genres such as fairy tales, fables and traditional stories
- how to explore drama using music, movement and dance
- that drama can be created and performed in different spaces, such as classrooms, halls or other familiar settings
- how simple props, costume, sound and lighting can support storytelling and performance
- that drama can be performed in different ways for different audiences and purposes

Audience

Pupils should learn:

- how to watch and listen attentively to live and recorded performances
- that audiences respond to performances and can affect how they feel and unfold
- how to talk about what they liked or disliked in a performance and explain their preferences
- that different people may have different opinions about the same performance
- that what is seen and heard on stage or screen can represent meaning
- how to reflect on their own performances and those of others, identifying what worked well and what could be improved

Dramaturgy

Pupils should learn:

- that drama is written to be performed, not simply read
- that stories and plays can be retold or adapted for different audiences
- that drama can communicate ideas and messages, including ideas about morality
- that stories and drama come from different times and places
- how to explore drama linked to their own lives, locality and community

Geography

Key Stage statement

In Key Stage 1, pupils begin to study places at a range of scales, from their local area and Northern Ireland to the British Isles and the wider world. They learn to locate and name places using maps, atlases and globes, and begin to understand how places are shaped by both physical features and human activity. Through local fieldwork, pupils develop geographical skills, including using simple directions and representations, and asking questions to help them understand some connections between people and environments.

Place knowledge

Pupils should learn:

- where Northern Ireland is located within the United Kingdom and in relation to the Republic of Ireland
- the names and locations of the capital cities in the British Isles, and the surrounding seas
- the names and locations of the world's continents and oceans
- key human and physical features of their local area and of at least two contrasting areas of comparable size, one within Northern Ireland and one outside the British Isles

Human and physical geographical knowledge

Pupils should learn:

- names and characteristics of settlement types including, hamlet, farm, village, town and city
- about some human features (e.g. bus stops, hospitals, playgrounds, railway stations) and some physical features (e.g. beach, forest, mountain, valley) ensuring a blend of those in everyday experience (e.g. street, field) and those beyond everyday experience (e.g. airport, volcano)
- that physical features affect people (e.g. settlements grow around rivers; forests provide shade; beaches attract tourists) and people affect physical features (e.g. people farm land, build houses, cut down trees, build dams in rivers)
- examples of human activities (e.g. farming, recycling, tree planting) which affect habitats and living things

- that temperatures vary around the world with hotter regions near the Equator and colder regions near the North and South Poles
- about daily and seasonal weather patterns in Northern Ireland and their local area

Geographical skills, enquiry and fieldwork

Pupils should:

- observe and record aspects of the world changing over time (e.g. on a classroom chart of weather changing across a fortnight)
- observe and describe similarities and differences between places with appropriate geographical vocabulary (e.g. barn, house, school; beach, forest, valley; busier or quieter, flat or hilly)

Pupils should learn to use:

- maps, atlases and globes in order to locate oceans, continents, selected countries and cities
- the four main points of the compass (north, east, south, west) in order to give and follow simple directions on a map
- ground photographs and aerial photographs in order to identify simple human and physical features

Pupils should undertake:

- fieldwork in their local environment, including the school grounds, noticing what is around them, asking simple questions and making observations about human and physical feature

History

Key Stage statement

In Key Stage 1, pupils continue to learn about the past by listening to a range of stories about people and events from contrasting periods and places. As they progress through the Key Stage, pupils learn about the past through stories told at different scales, both small, human-scale stories and larger overviews. Through these stories, pupils gain a nascent chronological framework and develop their knowledge of similarities and differences between past periods and the present. During this key stage, pupils begin their more systematic, chronological study of the past, laying foundations for their ongoing study of history that will eventually move through all periods of human history. This means that they learn about the first humans and the early migrations. They learn about ways of life during the Stone Age in Britain, Ireland and the world. Pupils expand their vocabulary of common words and phrases used to describe time and the passing of time.

Key Stage 1 expands pupils' knowledge of how we come to know about the past by introducing a range of source types. By studying an aspect of the past in their own locality, pupils respond to their surroundings and connect the past to their own lives. Pupils develop an understanding of how their locality's history has shaped and been shaped by wider events and developments, and an awareness that history happens where they live.

Substantive knowledge

Pupils should learn:

- about historically significant events, individuals, places or objects in their localities (e.g. St. Moninna and the Church of Killeavy, Struell Bathhouses and Wells, Carrickfergus Castle, La Girona Treasures, the Derry Walls, Hilden Mill, the industrial village of Edenderry, Belfast shipyards)
- about some historically significant events in British, Irish and wider world history spanning contrasting periods and places (e.g. the first Olympics; Hannibal's march over the Alps; the creation of the Book of Kells; the Viking settlement of Dublin; the building of Tenochtitlan; the Muslim conquest of Constantinople; Elizabeth I and the Spanish Armada; the invention of the printing press; the opening of the first public railways; Edison's invention of the lightbulb; the discovery of Tutankhamun's tomb; the first moon landing)

- some stories of historically significant individuals from contrasting periods and places who reveal characteristic features of the world in which they lived, including:
    - travellers and explorers (e.g. Ernest Shackleton, Charles Darwin, Amelia Earheart, Sir Edmund Hillary and Tenzing Norgay, Valentina Tereshkova, the Polynesian wayfinders and Easter Island)
    - inventors, scientists and mathematicians (e.g. Alexander Graham Bell, Leonardo da Vinci, Al-Khwarizmi, Ada Lovelace, Isaac Newton, Alan Turing, Marie Curie, Robert Boyle, Rosalind Franklin)
    - campaigners (e.g. Isabella Tod, Lord Shaftesbury, Eva Gore Booth, Martin Luther King, Rosa Parks)
    - rulers (e.g. Cleopatra, Brian Boru, Genghis Khan, Elizabeth I)

The first humans, early migrations and the Stone Age in Britain, Ireland and the world

Pupils should learn about the Stone Age in Britain, Ireland and the world through a blend of overview and depth, integrating elements of the following:

- migrations of the first humans from Africa, including the arrival of humans in Britain and Ireland
- changes in how people lived in hunter gatherer societies (e.g. stone tools, control of fire, domestication of dogs; increasingly complex hunting techniques)
- the development of farming in the Neolithic period, including the introduction of farming to Britain and Ireland by Neolithic settlers
- how Neolithic people lived, including early settlements (e.g. Mountsandel, Skara Brae or Starr Carr) and their material culture (e.g. wooden housing, weapons and tools, pottery, log boats, bone and wooden objects – needles, combs, flutes, ladles, jewellery)
- Neolithic art and ceremonial symbols, including local megalithic monuments or tombs and objects found in them (e.g. the Ulster Court Tombs, Newgrange, the Giant's Ring, Annaghmare Court Tomb or the Céide Fields)

Disciplinary knowledge

Pupils should learn:

- to use time conventions, dating and periodisation conventions, including:
    - the contrasting conventions of BC / AD and BCE / CE
    - centuries, decades, years
    - the names of periods studied
- to use common words and phrases to talk about the passing of time, sequencing, and comparison
- to ask and answer questions about the past using sources
- to select and organise information to tell stories about the past
- about some of the most common types of sources archaeologists and historians use to learn about the past studied, including tombs, monuments, potsherds, weapons, tools, letters, photographs, paintings, speeches

Mathematics

Key Stage statement

In Key Stage 1, pupils build on their Foundation Stage experiences to develop secure knowledge of number, the beginnings of formal calculation, and a growing repertoire of mathematical language. This is the stage at which fluency is established in the most foundational ideas that unlock later learning, ideas that must be secure before later learning can proceed. Through practice, key facts and methods become automatic and 'natural'.

In number and algebra, pupils extend their understanding of place value from tens to thousands, learning to read, write, compare and order numbers. They develop addition and subtraction through a range of representations and begin to work with multiplication and division, understanding these operations through grouping, sharing, repeated addition and arrays. They begin to work with fractions, with an emphasis on these as numbers on a number line.

In geometry and measure, pupils name and describe a growing range of 2-D and 3-D shapes, identify angles and turns, and begin to work with standard units of length, mass and capacity. They read scales, tell the time, work with money, and start to navigate grids. In probability and statistics, they collect, organise and represent data, and answer simple questions about what it shows.

Number and algebra

Integers

Primary 3

Pupils should learn:

- < and > symbols
- the place value of both digits in a two-digit number, knowing that 10 units are exchanged/regrouped for a single ten

Pupils should learn to:

- read and write numbers to 100 in numerals and words
- compare, order and estimate numbers/quantities within 100, including using the language of equal to and between
- identify and represent numbers to 100 using objects and pictorial representations

- count in steps of 2, 3, and 5 from zero forwards and backwards within 100
- count in tens to and from any number within 100
- identify a missing value(s) between two numbers within 100
- partition any two-digit number into tens and units (e.g. 56 = 50 + 6 and 56 = 40 + 16)

Primary 4

Pupils should learn:

- 1000 is equal to ten hundreds or one hundred tens
- the place value of any digit in a three-digit number

Pupils should learn to:

- read and write numbers to 1000 in numerals and words
- count forwards and backwards in multiples of 10, 50 and 100 up to 1000
- count in ones, tens, and hundreds to/from any number within 1000
- identify and represent numbers to 1000 using objects and pictorial representations
- compare, order, and estimate numbers up to 1000
- partition any three-digit number into hundreds, tens and units (e.g. 156 = 100 + 50 + 6 and 156 = 140 + 16)
- count forwards and backwards within 1000 using step increments

Integers (Operations)

Primary 3

Pupils should learn that:

- multiplication is commutative but division is not
- multiplication and division are inverse operations
- a number is even if there are none left over when dividing by two
- a number is odd if there is one left over when dividing by two
- multiplication and division can be understood through several related structures: multiplication can be represented as repeated addition and scaling, while division can be interpreted as either quotitive or partitive division[1]

1 Teachers do not need to use these terms with pupils, but they should understand the distinctions.

Pupils should learn to:

- recall and use addition and subtraction facts up to 20 fluently, and derive and use related facts up to 100
- add and subtract, using appropriate representations (including symbols, bar models and number lines) and choosing efficient strategies:
    - a two-digit number and a single-digit number
    - a two-digit number and a multiple of ten
    - two two-digit numbers
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables (these and all other multiplication tables to be learned up to x 10)
- multiply and divide using appropriate representations (including symbols, bar models, and arrays) and choose efficient strategies

Primary 4

Pupils should learn to:

- add and subtract numbers of up to three digits using the formal written methods of column addition and subtraction, including with regrouping
- add and subtract up to three-digit numbers using efficient mental strategies:
    - by partitioning, bridging, and compensation, including cases that cross tens and hundreds
    - by counting on or back in multiples of ten and one hundred
- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- use appropriate representations (including symbols, bar models, number lines and arrays) for addition, subtraction, multiplication and division problems, choosing efficient strategies
- use known multiplication facts to derive related facts (e.g. by doubling or multiplying by ten)
- multiply a two-digit number by a one-digit number using mental and written strategies

Rounding and estimation

Primary 3

Pupils should learn to:

- identify the two nearest multiples of 10 for a given number and state which one it is closest to
- estimate the position of a value on a number line to 100

Primary 4

Pupils should learn to:

- round numbers of up to 1000 to the nearest 10 and 100
- estimate the position of a value on a number line to 1000
- estimate answers to calculations by rounding one or more numbers

Fractions

Primary 3

Pupils should learn that:

- a fraction is part of a whole
- unequal partitions are not halves or quarters
- the numerator and denominator describe different parts of the fraction. A fraction can be written with a slanted line or horizontal line (e.g. ¾ or $\frac{3}{4}$)
- a unit fraction is a fraction where the numerator is one

Pupils should learn to:

- read and write unit fractions, indicate them by shading a simple diagram, and place them on a number line
- compare and order unit fractions

Primary 4

Pupils should learn that:

- the same fraction can be written as many equivalent fractions without changing the value
- a non-unit fraction is a fraction where the numerator is not one

Pupils should learn to:

- read and write non-unit fractions (including those greater than one whole), indicate them by shading a simple diagram, and place them on a number line
- compare and order unit and non-unit fractions with the same denominator
- demonstrate equivalency of two or more equivalent fractions using a pictorial representation or double number line
- compare and order non-unit fractions with the same numerator
- add and subtract fractions with the same denominator where the total is less than a whole

Sequences

Primary 3

Pupils should learn to:

- continue and create a repeating pattern involving numbers
- recognise skip counting is a repeating numeric pattern

Primary 4

Pupils should learn to:

- recognise, complete, continue and create a repeating pattern involving an increasing or decreasing constant amount (limited to integers)

Algebraic representation

Primary 3

Pupils should learn that:

- a symbol, such as a box or question mark, can be used to represent an unknown number

Equations and inequalities

Primary 3

Pupils should learn that:

- the equals sign means 'is equal to' and is not directional

Pupils should learn to:

- express equalities involving differently partitioned quantities (e.g. $5 + 2 = 3 + 4 = 6 + 1$)

Geometry and measure

Measurement

Primary 3

Pupils should learn to:

- estimate, measure and compare length/mass/capacity using standard units:
    - length – centimetres/metres
    - mass – kilograms
    - capacity – litres
- read scales of 2, 5 and 10 when measuring length/mass/capacity
- tell the time using the language of 'quarter to/quarter past' (on both an analogue and digital clock)
- tell the time to the nearest five minutes (drawing times accurately on analogue clocks)
- know the length of different units with time (e.g. 60 minutes in an hour, 24 hours in a day)
- find different combinations of coins to create the same amount of money
- add and subtract quantities of money using coins to give change

Primary 4

Pupils should learn to:

- estimate, measure, compare, and add and subtract length/mass/capacity using standard units:
    - length – millimetres/centimetres/metres/kilometres
    - mass – grams/kilograms
    - capacity – millilitres/centilitres/litres
- choose appropriate units when solving problems involving standard units of measure
- read scales of 20, 25 and 50 when measuring length/mass/capacity
- tell the time to the nearest minute (drawing times accurately on analogue clocks)
- calculate time periods in whole numbers of hours (e.g. earlier or later)
- follow and give simple directions to move objects for multiple movements (left, right, up, down, above, below, beside)

- compare and order units of measurements and use symbols to compare <, >, =
- recognise, use, compare and order different units of money presented in pounds (£) and pence (p)
- know the number of seconds in a minute, number of days in each month, number of days in a year and a leap year

Geometry

Primary 3

Pupils should learn to:

- name and sketch 2-D shapes, identifying and describing their properties using the terms sides and vertices, regardless of their size or orientation (including pentagon, hexagon, octagon and decagon)
- name 3-D shapes, identifying and describing their properties using the terms faces, edges and vertices (including cube, cuboid, pyramid and prism)
- name cones and cylinders, identifying and describing their properties
- compare and sort shapes into groups based on their properties
- identify angles as a property of a shape between two lines meeting
- identify the following angles, and their corresponding turn (including within shapes):
    - right angle, quarter turn
    - two right angles, half a turn
    - three right angles, three quarter turns

Primary 4

Pupils should learn to:

- name 2-D shapes, identifying and describing their properties using the terms sides and vertices, regardless of their size or orientation (including septagon, heptagon, nonagon and dodecagon)
- identify and describe the properties of more complex 3-D shapes (including tetrahedron, octahedron, dodecahedron)
- recognise the 2-D shape of a cross-sectional face of a 3-D shape (e.g. the cross section of a cuboid could be rectangles, or rectangles and squares)
- identify and describe 3-D shapes using the terms faces (flat surfaces) and curved surfaces, including when presented in different orientations

Perimeter, area and volume

Primary 4

Pupils should learn to:

- recognise perimeter as the distance around the boundary of a shape
- find the perimeter of shapes by counting or adding non-standard equal-length units
- identify and measure the perimeter of a 2-D shape as the sum of its side lengths
- recognise area as the amount of surface a 2-D shape covers
- measure area by counting the number of equal-sized units used (e.g. counting how many squares cover a shape)

Coordinate geometry

Primary 3

Pupils should learn to:

- identify, describe and draw horizontal and vertical lines
- use positional and directional vocabulary to describe and follow movements along straight lines and turns, including rotations in right-angle steps, recognising that each right-angle turn is a quarter turn

Primary 4

Pupils should learn to:

- describe positions on a 2-D grid, identifying rows and columns
- locate objects and label positions using two reference early coordinate systems (e.g. letter/number, A3)

Probability and statistics

Using data

Primary 3

Pupils should learn to:

- organise a given data set into a table, including with tallying
- represent and interpret data using pictographs, block charts and bar charts, including using many-to-one correspondence and scales with simple ratios (e.g. 2, 5, 10)

- answer questions about a data set using a given representation, including calculating and comparing totals (e.g. 'how many more people prefer X to Y?')
- organise and classify data by sorting items into two or more groups according to their properties, including using Venn diagrams and Carroll diagrams

Primary 4

Pupils should learn to:

- represent and interpret data choosing scales with the most appropriate ratio

Data collection

Primary 3

Pupils should learn to:

- collect discrete numerical data from their immediate environment (e.g. how many siblings classmates have)

Primary 4

Pupils should learn to:

- differentiate between categorical or numerical data
- consider whether data collection was fair

Music

Key Stage statement

At Key Stage 1, natural curiosity will transform into a deeper appreciation of sound as children come to know and understand a greater range of musical terms. By moving from simply hearing sounds, to listening and talking about them, pupils develop knowledge and understanding of the key components of music participating in a shared musical language. When singing and playing simple percussion instruments, a deeper understanding of these elements will result in sounds becoming more intentional and controlled. As pupils perform and compose music, they will begin to express feelings and ideas with increasing intuition and confidence. At Key Stage 1 pupils will progress from playing alongside each other to playing with one another, participating in group music-making. They will also develop their group music making skills through creating musical ideas in small groups and as a whole-class. Pupils will learn about how musical sounds and silence can be represented with signs and symbols. They will expand their knowledge of musical styles (repertoire) by learning to sing longer rhymes, songs and chants, from a range of local and global contexts.

Communicating through music

Singing and playing

Pupils should learn:

- to sing a range of songs in unison increasing in challenge from the Foundation Stage with the use of call and response (e.g. 'He's got the Whole World in His Hands'), increased pitch range (e.g. 'I Wanna Be Like You') and longer phrases (e.g. 'Yellow Submarine')
- to sing short phrases using one breath (e.g. 'my Aunt Jane she called me in', 'she gave me tea out of her wee tin')
- to prepare for singing by warming up the voices and adopting a good posture that allows for breath support
- to play longer (e.g. two bar) rhythmic patterns on body or untuned percussion
- to play short, three or four-note melodic patterns on a tuned instrument (e.g. chime bars, recorders, in groups with boomwhackers)
- to control the dynamic with which they sing and play, presenting their music with more expression as a result

- to respond to the following directions when playing:
    - a count in
    - an ending
    - increases/decreases in volume (dynamics)
    - increases/decreases in speed (tempo)

Representing and reproducing sound

Pupils should learn:

- to play longer musical patterns and phrases using symbols, gestures and pictures as an aid
- to use syllables, for example ta ti-ti ti-ti ta, to learn music containing two, one and half beat notes
- purposeful gestures/movements for responding to music
- to identify and understand that silence in music is a rest

Listening, responding and describing

Pupils should learn:

- to communicate using musical language to describe the sounds that they hear and the feelings they evoke:
    - **dynamics:** whether the sound is loud (forte) or quiet (piano)
    - **mood:** whether the music is upbeat/happy or more sad-sounding
    - **pitch:** whether the sound is high or low
    - **tempo:** whether the music is fast or slow
    - **timbre/instrumentation**: the names and sounds of common tuned instruments (e.g. xylophone, piano)

Pattern

Rhythm

Pupils should learn:

- to identify independently the pulse or steady beat in a piece of music by clapping, marching, moving or playing
- that 'a rhythm' is a short pattern of sounds and silence

- that these sounds have 'rhythmic values' defined by their duration (e.g. short and long notes, one/two/four beat notes)
- to play accurately music built entirely on rhythm using their bodies, voice or simple percussion such as tambourine, maracas or claves
- to arrange rhythmic ideas, with pictorial aids, into contrasting sequences
- to combine rhythmic patterns to accompany a story, pairing them with well-chosen timbres

Melody

Pupils should learn:

- to describe the main tune of a piece of music as the melody
- that the songs they sing have phrases

Texture

Pupils should learn:

- that musical texture refers to the independent layers in a piece of music
- to combine more than one layer of rhythmic patterns, (e.g. playing from a musical sound grid combining contrasting rhythmic layers using a digital audio workstation)

Place and purpose

Pupils should learn:

- about place, purpose and people when playing, creating and listening (e.g. 'Mickey Marley's Roundabout' song which narrates communal efforts in the wake of disaster; instruments with distinct cultural origins which help link timbre to place, such as castanets or the bodhran; pieces based on national folk tales and folklore such as *In the Hall of the Mountain King* by Edvard Grieg)

Physical Education (PE)

Key Stage statement

Key Stage 1 focuses on increasing accuracy, control and timing to enable all pupils to move with greater fluency, intention, confidence and enjoyment. Pupils refine and combine fundamental movement skills, they deepen their understanding of how different physical activities are structured and they learn how simple tactics and decisions inform outcomes, moving from participating towards purposeful play.

Pupils also extend their knowledge of how the body works and responds to activity, understanding preparation, recovery, safety and the important role that participation in physical activity and sport plays in both physical health and mental wellbeing.

Physical movement

Pupils should learn to:

- apply fundamental movement skills with improved control, accuracy, balance, coordination and fluency (e.g. using different locomotor skills to move from one point to another using different levels, directions, speeds, pathways and in relation to apparatus [over, under, through], people [near, far, mirroring], or objects)
- link fundamental movement skills together safely (e.g. run-jump-land, roll-balance, throw-move-catch)
- use different speeds, forces, directions and levels to suit the purpose of a movement or activity (e.g. moving lightly to balance, using stronger force to send a ball)
- use spatial and relational awareness to move safely and effectively around others, apparatus and objects (e.g. matching, mirroring, leading/following, moving to create or avoid space, track the path of a ball)
- use fine motor control to handle smaller equipment and perform more complex object-control tasks (e.g. catching and throwing with one hand, striking a moving object with short bats or paddles, or controlling a ball through simple sequences such as roll-trap-throw)
- respond to visual, verbal and rhythmic cues in dance and gymnastics to time and coordinate movement sequences that include relationships with others (e.g. copying and leading)

Conventions

Pupils should learn:

- what constitutes fair and unfair behaviour in physical activities
- to practise tactics such as finding space, staying near an opponent and helping a teammate

Pupils should:

- adopt basic group roles in simple games (e.g. leader/follower, thrower/catcher)
- learn the purpose and structure of different activities (e.g. how games, dance or athletics are organised) and what makes successful participation in them (e.g. the importance of speed, weight and time in dance and gymnastics)
- follow simple activity-specific rules (e.g. starts, restarts, participating within boundary lines)
- create and adapt simple movement ideas to seek solutions in games, dance and other physical challenges

Physical health

Pupils should learn:

- that different types and intensities of activity affect how the body feels (e.g. higher intensity is linked to faster breathing)
- the main role of the heart, lungs, bones and muscles in physical activity
- simple links between warm up for activity and quality of participation, the role of rest in healthy physical participation

Personal, Social, Civic and Careers (PSCC)

Key Stage statement

At Key Stage 1, PSCC builds pupils' ability to understand their emotions, to reflect on their choices and to practise empathy during familiar classroom interactions. Pupils start to understand that while some new skills might seem harder to master than others, that effort and persistence will pay off. They are introduced to rights and responsibilities, belonging to communities and to the idea that actions can affect others and the wider world. They are introduced to ideas about jobs, about money choices and about using technology to assist them.

The nature of study is structured practice with plenty of talk and modelling. Pupils rehearse calm breathing and other simple strategies, use stories to explore ethical dilemmas and take part in age-appropriate decision-making (e.g. voting in class). Short tasks link school subjects to everyday jobs, while foundational financial and digital behaviours are learned through practical, low-stakes scenarios.

Self and learning

Psychology of learning and behaviour

Pupils should learn:

- that practising something regularly (e.g. reading, writing, skipping, throwing and catching) helps them improve and that practice requires care and attention
- that persistence means sustaining effort and continuing after mistakes have been made
- that some strong emotions can influence our ability to make good choices and that there are strategies which we can use to help with this, including:
    - using calming techniques such as steady breathing, which can help us self-regulate
    - asking for help or advice from a trusted adult

Health and wellbeing science

Pupils should learn:

- how to maintain personal hygiene routines (including handwashing and toothbrushing) and why these matter

- that good habits around sleep, nutrition, screen time and physical activity support attention, learning, health and mood
- what a healthy diet looks like, including the importance of fruit and vegetables, and the effect of sugary food and drink on the body
- that babies become children and then adults
- that some parts of the body are private and should not be touched without the permission of the person whose body it is
- that they should always tell a trusted adult if something feels wrong or unsafe and this includes any 'secrets' where these relate to safety
- about keeping safe around medicines and other household products

Relationships and society

Social understanding

Pupils should learn:

- how to look at a situation from another person's perspective, using simple stories and dilemmas
- about good manners, including courtesy, queuing, noticing and considering the needs of the old/weak, self-restraint, when/where not to be noisy/boisterous in shared spaces
- about harms of inaccurate or unhelpful generalisations about groups of people (e.g. unacceptable male and female stereotypes concerning jobs or behaviours)
- that friendships need kindness and sometimes require patience and respect for boundaries
- how to resolve disagreements constructively, calling on adults when necessary
- about roles and responsibilities within families and that family relationships involve cooperation
- that the expression of physical affection between people (such as holding hands, hugging, or kissing) should be wanted by everyone involved and that it is always okay to say 'no' to physical contact

Citizenship and civic understanding

Pupils should learn:

- that people belong to different communities (e.g. family, school, neighbourhood, town)
- that communities have rules to protect the interests of individuals and of the community as a whole

- that rules are made and updated by schools and other institutions and by local, regional and national governments
- that governments are elected by the people who live and are entitled to vote in their areas
- that everyone has rights and responsibilities and that responsibilities include taking care of public spaces which others use, noticing others' needs around them (e.g. holding a door open for an elderly or disabled person), contributing to groups, communities and teams, and treating one another kindly and with courtesy
- how individual actions can affect the wider world

Ethics and moral reasoning

Pupils should learn:

- the difference between beliefs, opinions and facts
- to explain whether an action is right or wrong by considering consequences, what is fair, the rules or duties involved and what the action tells us about a person's character
- to express agreement or disagreement with an idea and justify their view
- that people sometimes make mistakes and can take responsibility for them

Careers and futures

Careers and future pathways

Pupils should learn:

- that there is a wide range of jobs and roles in society and that people's strengths and interests relate to different kinds of work
- how what we learn in school, including reading, mathematics, communicating, designing and making things, teamwork, is all relevant to everyday jobs
- how to set and achieve simple personal goals (e.g. keeping belongings tidy, practising independence in everyday routines)
- how digital tools are used in different jobs

Science

Key Stage statement

Key Stage 1 science revisits and consolidates the key concepts and ideas from Foundation Stage, while introducing new knowledge and vocabulary which give pupils the ability to explain more scientific phenomena. Pupils learn how material properties change, how forces affect movement and how light and sound behave. They gain a richer vocabulary for describing, observing and asking scientific questions about the structure and functions of organisms and for classifying and comparing living things, their processes and diverse habitats. They learn to think more explicitly about the work of scientists, considering how scientists use specific methods to answer questions, with pupils gaining experience of scientific observation and experimentation.

Life sciences

The structure and function of organisms

Pupils should learn:

- that growth and nutrition are processes which occur in all living things
- that animals can change location to obtain food (and plants cannot)
- that the human body has bones, muscles and joints for movement, support and protection
- to name some major internal organs in humans (heart, lungs, brain, stomach) and identify their basic functions and approximate position (limited to the chest, abdomen and head)
- that some organs are linked and together carry out a life process (e.g. the mouth and some other organs, including the stomach, form the digestive system and support nutrition)
- the basic functions of plant organs (leaf, root, stem, flower, fruit)

Growth, reproduction and variation

Pupils should learn:

- that plants make their own food from air, water and sunlight (no other details of photosynthesis required)

- that growth can involve different life cycle stages (e.g. flowering plant/butterfly/mammal/amphibian/bird)
- that seeds are the way in which many plants produce offspring
- that in humans and some other animals, a female can become pregnant and a baby can be born
- that some diseases in plants and animals are caused by germs
- to compare the features (e.g. temperature, weather, landscape) of different habitats (e.g. tropical rainforest, desert, woodland, polar) and how animals have characteristics that allow them to live there
- to identify a variety of plants (common wild and garden plants including deciduous and evergreen trees) and animals in some local habitats and micro-habitats (e.g. in soil, tree, hedge, pond)
- that simple classification keys can help group and name/identify animals (e.g. vertebrates and invertebrates) and plants (e.g. flowering and non-flowering)

Interdependence of organisms

Pupils should learn:

- that organisms live in habitats where they are able to survive
- about simple food chains (including the terms carnivore, omnivore, herbivore, predator and prey)
- that some organisms rely on others for protection and living space (e.g. birds nesting in trees, fish in coral)
- about biological and behavioural changes of organisms across the four seasons (including deciduous trees, hibernation, migration)
- that some living things have become extinct and that this can occur when a habitat changes (e.g. dinosaurs)

Physical sciences

Matter and materials

Pupils should learn:

- that the properties of a material determine its specific uses (e.g. flexibility, buoyancy, absorbency, transparency)
- that materials can exist in different states i.e. as a solid, liquid or gas (e.g. the material water can exist as a solid (ice), liquid (water) or gas (steam)) and that heating or cooling can change a material's state
- that temperature is a measure of how hot or cold something is and that hot and very cold objects can be dangerous

Forces and motion

Pupils should:

- experience how an object's speed can be increased (e.g. by increasing the incline of a slope, or the force of a push) or decreased (e.g. by friction from a surface, or colliding with another object)
- experience and name a range of contact and non-contact forces, including friction, magnetism and gravity and know how they affect the movement of an object

Electricity and magnetism

Pupils should learn:

- that the force magnets exert is called magnetism
- that not all metals are magnetic
- that magnets have north and south poles and that like poles repel each other and opposite poles attract each other
- that the strength of a magnet and the distance between magnetic objects affects the size of the force

Light, sound and waves

Pupils should learn:

- that the eye senses light and to name the visible parts of the eye including the eyeball, eyelid, eyelashes, pupil and iris
- that we can only see an object if it reflects or emits light

- to explore how light passes through materials and classify them as transparent, translucent or opaque
- that light travels in straight lines from its source until it hits an object and that for opaque objects this explains how shadows form
- the basic parts of the ear including the outer ear, ear canal, ear drum
- that sounds are made by vibrations, which can travel through air or other materials as waves and be heard when vibrations reach our ears
- to explore how waves carry energy from one place to another; some we can see (e.g. water waves) and some we cannot see (e.g. sound)

Earth and space

Pupils should learn:

- that stars are spherical, giant balls of hot gases which emit heat and light
- that the Sun is a star that is much closer to us than all the others and that sunlight from the Sun brings energy to Earth providing light and warmth
- that Earth is a planet – a rocky mass which does not burn or emit light
- that our Solar System includes the Sun and planets that orbit it and that some planets can be seen with our eyes in the night sky
- to name the planets in order of increasing distance from the Sun

Nature, practices and norms of science

Nature of science and scientific knowledge

Pupils should learn that:

- in science we carry out scientific enquiries to explain how the world works
- different scientific questions are answered in different ways (e.g. classification can be used to sort materials into groups, whereas observing over time can be used to understand plant growth)

Investigating scientific questions

Pupils should learn how to:

- ask simple scientific questions and answer them using classification, identification and carrying out simple tests (appropriate to the content in this key stage)

- observe and talk about demonstrations that illustrate familiar and unfamiliar scientific phenomena and ideas
- use simple scientific apparatus to observe, measure and record (e.g. hand lens, ruler, stopwatch, egg timer), using units of measure where appropriate
- identify risks and suggest simple safety measures

Analysis, interpretation and communication

Pupils should learn how to:

- use different approaches to present scientific observations and data (e.g. tally charts, pictograms)
- use books and other secondary sources to help interpret data
- use the results of an investigation to reach and share simple conclusions about the questions we are trying to answer

Technology and design

Key Stage statement

Pupils now build clearer technological-conceptual knowledge of how common materials, simple structures and basic mechanisms behave. They begin to understand that products work as they do because of deliberate choices. As they gain experience with tools and common making techniques, their technological-procedural knowledge grows through increasing control, accuracy and care, helping them take pride in producing solutions that function more reliably.

At the same time, pupils' design-conceptual knowledge becomes more intentional. They learn that products are created for users, purposes and contexts, and that simple criteria help guide design decisions. As pupils describe what they want to make, judge how well their designs meet criteria, and make small improvements after testing, the four subject-specific categories work together to enable purposeful making underpinned by emerging reasoning. Across Key Stage 1, this interplay helps pupils experience accomplishment and enjoyment as they satisfy their natural curiosity with structured solutions and a vocabulary for talking about them, and as they see their ideas develop into workable outcomes.

Technological-conceptual knowledge

Pupils should learn:

- vocabulary for describing physical properties of materials (e.g. strong/weak, waterproof/absorbent, rigid/flexible, durable/not durable, natural/man-made) and how these properties relate to specific purposes, contexts and uses (e.g. indoors/outdoors, hot/cold environments)
- some ways in which shape and materials affect the stability of structures
- that basic systems have inputs, processes and outputs
- the way components are connected determines what the system does (e.g. switch + battery + bulb; syringe + balloon + load)

Technological-procedural knowledge

Pupils should learn to:

- mark out, shape, cut, join and finish materials with increasing control, choosing appropriate tools, using them safely with guidance (e.g. folding, rolling, cutting and twisting, making temporary mechanical and basic bonded joins)
- assemble parts so that specific movements occur (e.g. levers, linkages, axles and wheels)
- test their product during making, amending the process as necessary (e.g. 'is the kite frame going to be too heavy?'; 'will the wheels stay attached to the toy car?') and when finished (e.g. 'does my kite fly?'; 'can the toy car move?')

Design-conceptual knowledge

Pupils should learn:

- that everything around them in the made world has been designed intentionally (e.g. a glass is designed to hold a drink safely and comfortably, fitting a human hand; the stone towers or spires that medieval architects added to churches were designed to symbolise direct connection with god, to be a landmark, and to house bells which needed to be high up to be heard further; the sails on a windmill or blades of a wind turbine are designed to catch the wind)
- examples of things designers think about when creating solutions for everyday objects (e.g. a designer had to make this classroom chair stable, low enough for you to sit on, easy to store and built to last; the seat and handlebars of this bicycle had to be adjustable to match a rider's height)
- products can create both positive and negative impacts for users, others and the environment (e.g. a toy with a bell is fun but can be annoying for others; packaging keeps things safe but can create rubbish).

Design-procedural knowledge

Pupils should learn:

- to describe what they want to make and why (e.g. its intended purpose and who will use it) representing their ideas using basic sketches and models
- about factors that they need to think about in their design, such as size, safety, ease of use, weather, location (e.g. 'my parachute will need to be strong but light so that it will fall without breaking'; 'my paper tower will need to be stable enough to stand up on its own/ carry a weight')
- to consider modifications they could make to their design after testing a finished product or model

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