

# Felton C of E Primary School: Computing Curriculum

'Loving, Learning, Living as we journey together to enable everyone to flourish'

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## Intent

At Felton C of E Primary School it is our intention to prepare our children to be confident and competent within a world that is heavily shaped by technology. We also recognise that our children are using technology on a daily basis at home and at school. Through our coherently planned and academic curriculum, our children will develop:

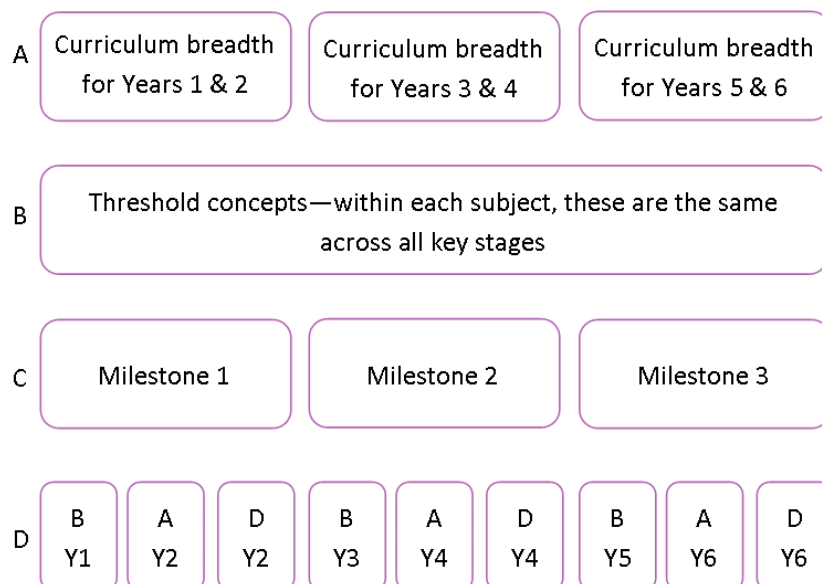
- the ability to connect with others safely and respectfully, understanding the need to act within the law and with moral and ethical integrity
- competence in coding for a variety of practical and inventive purposes, including the application of ideas within other subjects
- an understanding of the connected nature of devices
- the ability to communicate ideas well by using applications and devices throughout the curriculum
- the ability to collect, organise and manipulate data effectively

## Our coherently planned and academic curriculum

Our curriculum sets out:

- a clear list of the breadth of topics that will be covered;
- the threshold concepts pupils should understand
- criteria for progression within the threshold concepts
- criteria for depth of understanding

The diagram below shows a model of our curriculum structure:



We have a two year core offer which allows our children the opportunity to access our progressively spaced, spiral curriculum, with reinforcement of previously-learned concepts repeatedly, with increasing complexity throughout our school. This core offer of topics can be taught through different contexts, according to the needs of the children and cohort, but ensures excellent depth and breadth of learning.

## Threshold concepts

These are the key disciplinary aspects of each subject. They are chosen to build conceptual understanding within subjects and are repeated many times in each topic. This repetition leads to transference and confidence.

The threshold concepts in **Computing** are to:

**Code** - This concept involves developing an understanding of instructions, logic and sequences.

**Connect** - This concept involves developing an understanding of how to safely connect with others.

**Communicate** - This concept involves using apps to communicate one’s ideas.

**Collect** - This concept involves developing an understanding of databases and their uses.

The following is an example of how ELOs progress through the different milestones, with each milestone indicator representing a teaching and assessment focus.

<p><b>Connect</b> This concept involves developing an understanding of how to safely connect with others.</p>		<ul style="list-style-type: none"> <li>• Participate in class social media accounts.</li> <li>• Understand online risks and the age rules for sites.</li> </ul>	<ul style="list-style-type: none"> <li>• Contribute to blogs that are moderated by teachers.</li> <li>• Give examples of the risks posed by online communications.</li> <li>• Understand the term 'copyright'.</li> <li>• Understand that comments made online that are hurtful or offensive are the same as bullying.</li> <li>• Understand how online services work.</li> </ul>	<ul style="list-style-type: none"> <li>• Collaborate with others online on sites approved and moderated by teachers.</li> <li>• Give examples of the risks of online communities and demonstrate knowledge of how to minimise risk and report problems.</li> <li>• Understand and demonstrate knowledge that it is illegal to download copyrighted material, including music or games, without express written permission, from the copyright holder.</li> <li>• Understand the effect of online comments and show responsibility and sensitivity when online.</li> <li>• Understand how simple networks are set up and used.</li> </ul>
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It is important to note that this progression map will not be used to advance children beyond their age appropriate milestone. Progress within a milestone is measured in a different way. It is concerned with three cognitive levels of understanding for each milestone indicator. We call these cognitive levels of understanding Beginning, Advancing and Deep.

## Depth

We expect pupils in the first year of a milestone to develop a **Beginning** (B) understanding of the concepts and an **Advancing** (A) or **Deep** (D) understanding in the second year of the milestone. The first year (Academic years 1, 3 and 5) in a Milestone is the knowledge building phase that provides the fundamental foundations for later application. Learning at this stage must not be rushed and will involve a high degree of repetition so that knowledge enters the children’s long term memory and allows for sustained mastery.

In order to determine which tasks are beginning, advancing or deep, we refer to Chris Quigley’s Defining Depth document (see [Appendix 1](#)).

## **Breadth**

All pupils will be exposed to the full breadth of the National Curriculum for England's English Programme of Study which aims to ensure that all pupils:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

In years 1-6, the full breadth of coverage required by The Primary National Curriculum is ensured with the use of the Rising Stars Switched on Computing Scheme. which provides full coverage of the primary computing programmes of study. We follow this course as a whole to deliver a coherent, complete computing curriculum which helps pupils to progress their knowledge, understanding and skills in computing although we adapt the scheme to our school's context, curriculum, and to fit into our mini adventure learning journeys.

## **Fluency and Mastery**

There is a 'spiral' approach to the units covered, with themes recurring year by year. This provides ample opportunity for pupils to:

- consolidate technical skills
- achieve fluency with a range of key applications
- develop their knowledge and understanding of the principles that underpin digital technologies and the changing consequences of these for individuals and society.

Each year includes units covering the foundations, applications and implications of computing, ensuring that pupils progress in the computer science, information technology and digital literacy strands of the computing curriculum. It also encourages creativity, collaboration and thinking skills.

## **Computer Science**

In computer science, children learn to program first with BlueBots, then ScratchJr, then Scratch and the micro:bit. This takes children from a physical manipulative in Key Stage 1, through a pictorial representation of code with ScratchJr to a virtual, on screen, manipulative in which text-based programming is made more accessible through a block-based language. It also ensures progression through key programming constructs, with children introduced to sequence with the BlueBot, repetition in ScratchJr, and selection and variables with Scratch and MakeCode for the micro:bit. They develop their computational thinking: the ability to apply programming skills to solve real world problems systematically.

## **Information Technology**

Children acquire skills in using core 'office' applications to work with text, multimedia presentations and data analysis, as well as a competency with digital media from photography and audio to video, animation

and virtual reality. The programme of study for computing at Key Stage 1 requires that pupils be taught to 'use technology purposefully to create, organise, store, manipulate and retrieve digital content', and Switched On Computing ensures that they can do this using text, images, sound and video. Building on this at Key Stage 2, Switched On Computing helps them to 'select, use and combine' a variety of software on a range of devices. They work with both numerical data and information across a range of formats including those that combine both words and images.

### **Digital Literacy**

Children develop an understanding of how the Internet, the World Wide Web and search engines work, as well as learning how to use these and other technologies safely and responsibly.

### **Creativity**

Switched On Computing emphasises computing as a creative subject. Many units involve pupils in making digital artefacts, ranging from programs and presentations to virtual models and movies.

### **Collaboration**

Units also provide ample opportunity for children to learn together: in many units they work in pairs or small groups, and even when working individually there is opportunity built-in for them to give and receive feedback to others. Children become increasingly discerning in evaluating online content and their own and others' work.

### **Thinking skills**

The scheme encourages children to think about digital technology: computational thinking concepts such as logic, algorithms, decomposition and abstraction are emphasised throughout. Children are regularly asked to consider the broader moral and ethical issues raised by the technologies they study.

### **Online Safety**

Alongside the online safety themes covered in the Switched on Computing Scheme, we use the [National Online Safety Hub](#) to deliver lessons on keeping safe online. Developed in line with and to support statutory policy and recommended guidance, the lessons are directly aligned to and support the:

- UKCIS 'Education for a Connected World' framework
- DfE 'Relationships education, relationships and sex education (RSE) and health education' statutory curriculum
- DfE 'Teaching online safety in school' guidance

Based on the key topics outlined in the UKCIS 'Education for a Connected World' framework, the virtual lessons talk to the children about online dangers in a fun and engaging way. Each lesson has a range of accompanying activities to support learning and helps to provide young children with the knowledge to protect themselves from online risks.

Key topics include:

- Self-Image & Identity
- Online Relationships
- Online Reputation
- Online Bullying
- Managing Online Information

- Health, Wellbeing & Lifestyle
- Privacy & Security
- Copyright & Ownership

### **Retrieval of previously learned content**

We agree with the Ofsted research review for the new inspection framework which suggests:

*“Retrieval practice needs to occur a reasonable time after the topic has been initially taught and needs ideally to take the form of testing knowledge” and “it is good practice to block learning and repeat practice over time, as this leads to better long-term retention of knowledge”.*

Understanding that memory is the residue of thought, retrieval of previously learned content is kept frequent and regular, which increases storage and retrieval strength. The Switched on Computing Scheme, with its spiral approach and revisiting of units provides ample opportunity to consolidate technical skills.

### **Provision of Appropriate experiences and Cultural Capital**

We want to give pupils **appropriate experiences** to develop as confident, responsible citizens who value the importance of reading within their community and wider world by providing a rich **cultural capital**.

Cultural capital is the background knowledge of the world that pupils need to infer meaning from what they read and experience. This includes children having a comprehensive knowledge of vocabulary which they can use to interpret problems and to express themselves in a sophisticated and coherent manner. We agree with the following from the Primary National Curriculum:

*‘Through reading ... , pupils have a chance to develop culturally, emotionally, intellectually, socially and spiritually. Literature, especially, plays a key role in such development. Reading also enables pupils both to acquire knowledge and to build on what they already know’*

In considering our rural, relatively small context, we recognise the unique advantages children can gain from their reading experiences at Felton C of E Primary School and we also understand the need to implement strategies that broaden and extend their experiences.

Building cultural capital includes opportunities to gain valuable subject-specific knowledge. Some examples in computing are:

- creating and presenting virtual performances such as poetry recitals
- investigating how computing is used in various careers

### **Assessment and Feedback to children**

#### **Feedback**

Children are given feedback throughout computing tasks, usually verbally or in groups. Children develop a growing library of ‘digital artefacts’ that they have created in computing lessons, which are organised into their Google Drive, as evidence of their developing skills.

Children have regular opportunities to share their work with peers, and to gain feedback from adults and other children on what went well, as well as evaluating tasks in preparation for the revisiting of skills.

## Assessment

### Tracking progress

Using the assessable outcomes available in each unit, teachers track the learning that has taken place and record this in the online tracker. This feeds into any judgements made on the Depth of learning tracker.

### Depth of Learning Tracker

This is the online tracking, targeting and reporting tool linked to the Chris Quigley Essentials Curriculum. It allows staff to plot children's current attainment and identify the next steps in their learning. Children are assessed against the cognitive domains of Beginning, Advancing or Deep within each Milestone (Milestone 1 - end of Y2; Milestone 2 - end of Y4 and Milestone 5 - end of Y6). We expect pupils in the first year of the milestone to develop a **Beginning** (B) understanding of the concepts and an **Advancing** (A) or **Deep** (D) understanding in the second year of the milestone. For more detail please refer to [Appendix 2](#). For an example of progress indicators towards an ELO across a milestone, see [Appendix 3](#).

### Time to Shine

Each half term, children are given a chance to show how they have developed their knowledge in a mini adventure, in a 'Time to Shine' task. These are open-ended, low entry, high ceiling tasks, where children are given an opportunity to independently show what they have learned. There may be scaffolding provided to organise and present ideas and observations will be made by staff to further inform any assessments of depth which are made.

Success criteria for these tasks are shared with children so that they can effectively show their knowledge of the given ELOs. In years 1 - 6, these tasks are presented in a double page spread format; we expect that children will link their knowledge of the different subjects covered in order to present their learning in a comprehensive manner. Where appropriate, children may choose to, or be required to show computing skills in their presentation and creation of Time to Shine tasks.

**Appendix 1**  
**Defining Depth**

# Defining Depth

Depth of Learning	Cognitive challenge	Predominant teaching style	Type of success criteria	Nature of progress	Support	Quantity*	Typically, pupils will
Basic	Low level cognitive demand. Involves following instructions.	Modelling Explaining	Instructional (e.g. Steps to Success)	Acquiring	High	Some	name, describe, follow instructions or methods, complete tasks, recall information, ask basic questions, use, match, report, measure, list, illustrate, label, recognise, tell, repeat, arrange, define, memorise.
Advancing	Higher level of cognitive demand. Involves mental processing beyond recall. Requires some degree of decision making.	Reminding Guiding	Guidance (e.g. Remember to include)	Practising	Medium	Most	apply skills to solve problems, explain methods, classify, infer, categorise, identify patterns, organise, modify, predict, interpret, summarise, make observations, estimate, compare.
Deep	Cognitive demands are complex and abstract. Involves problems with multi-steps or more than one possible answer. Requires justification of answers.	Coaching Mentoring	Learner generated	Deepening understanding	Low	All	solve non-routine problems, appraise, explain concepts, hypothesise, investigate, cite evidence, design, create, prove.

\* Quantity judgements should be used when a large amount of knowledge needs to be learnt. For example, phonic knowledge and times tables.



## Appendix 2

### Expected Attainment towards milestones and National expectations for ARE

As part of our school's internal assessment systems, we use a range of ongoing assessment methods throughout the year to measure achievement towards 3 different points:

- Milestone 1 is the end of KS1 (Yr2) and matches national age related expectations
- Milestone 3 is the end of KS2 (Yr6) and matches national age related expectations

We add Milestone 2 at the end of year 4. This gives us an additional 'stepping stone' in order that we can track children's achievement and establish that at the end of year 4, they are on track to meet KS2 expectations at the end of year 6.

We assess children to be 'beginning' (basic) (B), 'advancing' (A) or 'deep' (D) learners at each milestone.

#### At the end of Year 2:

Children working below Advancing 2 are not yet meeting national expectations.(B)

Children working at Advancing 2 towards Milestone 1 are meeting national expectations for the end of year 2 (A)

Children working in the Deep zone are exceeding national expectations. (D)

#### At the end of Year 4:

Children working below Advancing 2 towards Milestone 2 are not yet meeting national expectations. (B)

Children working at Advancing 2 towards Milestone 2 are meeting national expectations (ie are on track towards end of year expectations at the end of KS2 in year 6) (A)

Children working in the Deep zone at Milestone 2 are exceeding national expectations. (D)

#### At the end of Year 6

Children working below Advancing 2 towards Milestone 3 are not yet meeting national expectations for the end of year 6(B)

Children working at Advancing 2 towards Milestone 3 are meeting national expectations for the end of year 6 (A)

Children working in the Deep zone at Milestone 3 are exceeding national expectations for the end of year 6 (D)

**Children in year 1** are working towards Milestone 1 (ie the end of KS1 expectations in year 2)

**Children in year 3** are working towards Milestone 2 (ie where they need to be by the end of year 4)

**Children in year 5** are working towards Milestone 3(ie the end of KS2 expectations in year 6)

Please note children at the beginning of a Milestone (ie those in years 1, 3 and 5) may not show progress against all areas of the milestone. Each Milestone is taught across 2 years and therefore children may not yet have had some curriculum content introduced.

In addition to the written information, the charts in the children's reports are a pictorial representation to allow parents to see their child's attainment (B, A or D) towards a milestone across the different aspects of reading, writing and maths. Each child's individual targets are their next steps to ensure secure attainment across all aspects of the subject at a particular milestone.

Appendix 3

## Computing – Milestone 2

Learning Objective	Key Indicators	Basic	Advancing	Deep
To connect	Give examples of the risks posed by online communications.	Some examples of online risks are offered, when questioned.	Whilst online, there is a growing awareness of how to keep safe.	Many good examples of how to keep safe whilst online are provided.
	Understand the term 'copyright'.	There is some awareness of the term 'copyright' and what it means.	The term 'copyright' is generally understood.	The term 'copyright' is understood and the understanding of its meaning applied to a number of contexts.
	Understand that comments made online that are hurtful or offensive are the same as bullying.	There is some awareness that hurt and offence may be caused online.	In discussion, some good examples of how to behave respectfully towards others online are provided.	There is a good understanding of how to behave respectfully towards others online.
	Understand how online services work.	There is some awareness of how online services work.	There is a growing understanding of how familiar online services work.	Many good examples of how online services work are provided.