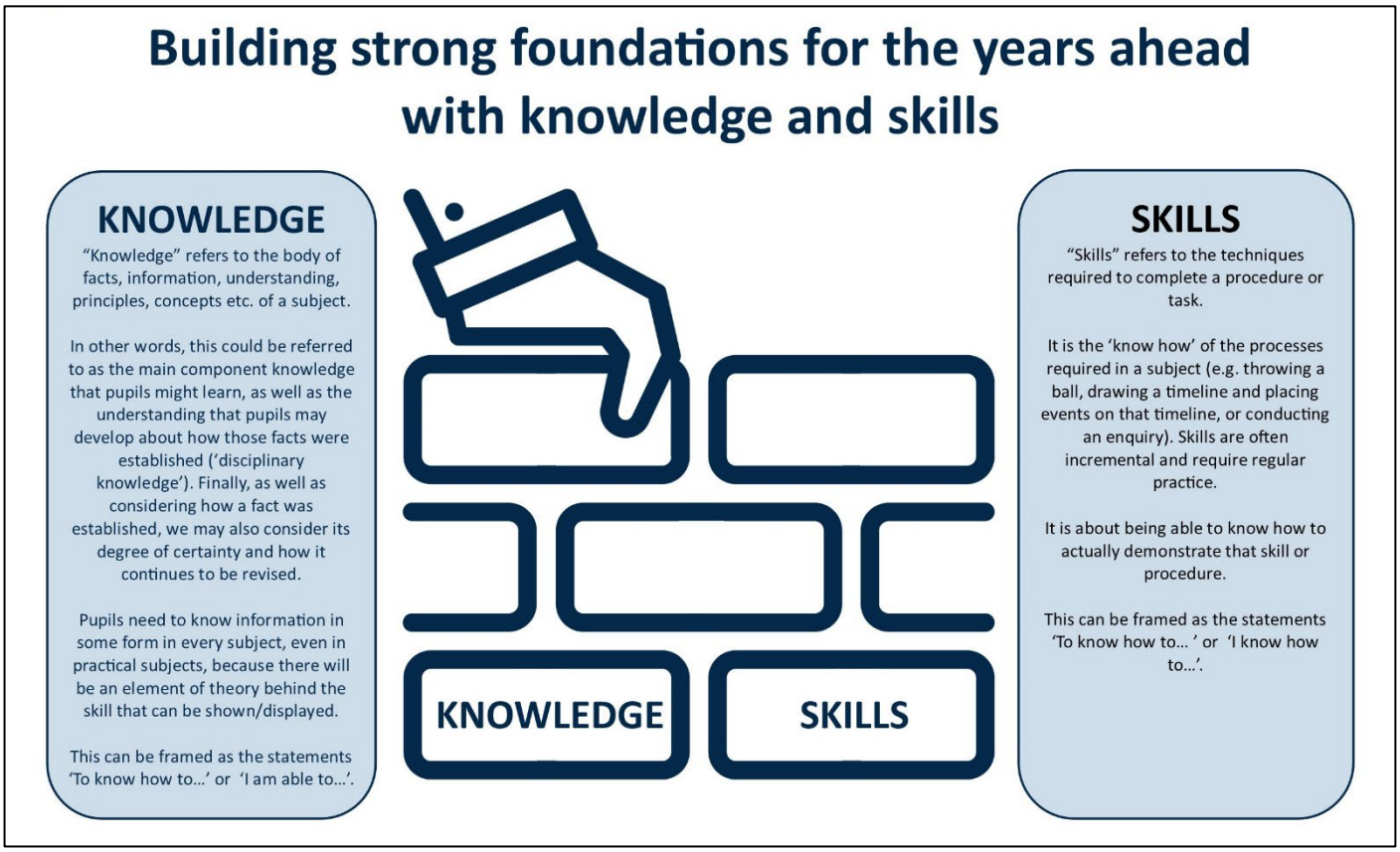
Knowledge and skills: introduction

At Sonning, we first considered the concept of knowing more, doing more and remembering more. Therefore, from our research, we have a shared and consistent understanding of different types of knowledge. Each subject will have a different ratio of distribution for these types of knowledge, and the types of knowledge can (and most often do) intersect.

1. Knowledge refers to the body of facts, information, understanding, principles and concepts etc. of a subject. In other words, this could be referred to as the main component knowledge that pupils might learn (e.g. knowing the components of a computer/laptop, knowing what programming is, or knowing how to log in to a device), as well as the understanding that pupils may develop about how those facts were established (aka disciplinary knowledge). Finally, as well as considering how a fact was established, we may also consider its degree of certainty and how it continues to be revised. Pupils need to know information in some form in every subject, even in practical subjects, because there will be an element of theory behind the skill that can be shown/displayed.

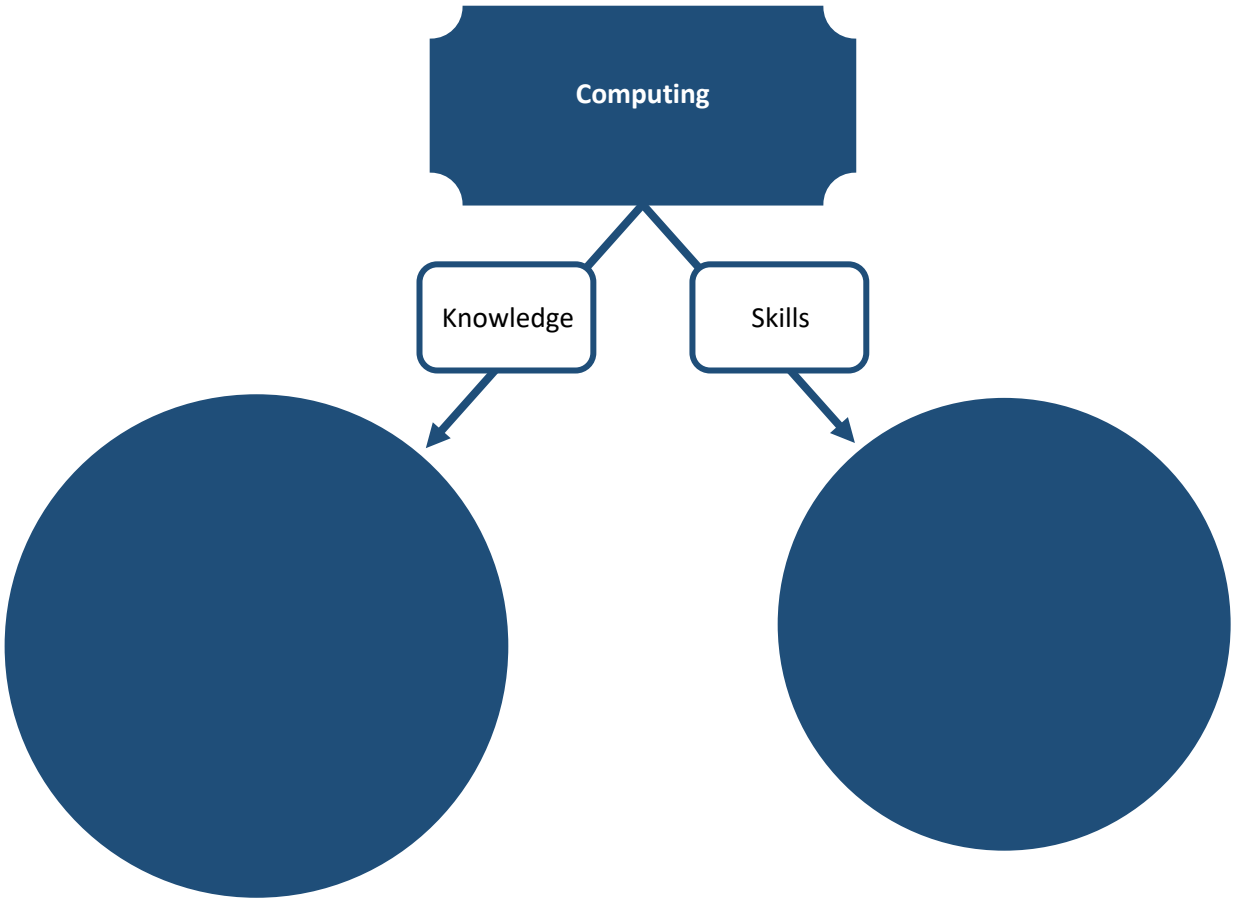
2. Skills refers to the techniques required to complete a procedure or task. It is the 'know how' of the processes required in a subject (e.g. being able to actually use a keyboard or programme using Scratch). Skills are often incremental and require regular practice. It is about being able to know how to actually demonstrate that skill or procedure.



Sonning's Infographic on Knowledge and Skills

Knowledge distribution

We recognise that different subjects have different weightings of knowledge and skills. The infographic below highlights what we consider to the ratio of each form of knowledge within this subject:



Our vision

Computing at Sonning Church of England Primary School focuses on the three pillars, as outlined in the Ofsted research review:

1. **Computer science**
   Including knowledge of computers and computation, such as data, system architecture, algorithms and programming.
2. **Information technology**
   Including a focus on how computers are used in different sectors and the methods used to create 'digital artefacts' (digital objects created by humans) such as presentations, spreadsheets and videos.
3. **Digital literacy**
   Including the skills and knowledge required to be an effective, safe and discerning user of a range of computer systems.

Our aim is to teach our pupils to understand and use relevant technology safely and effectively, be brave and resilient when using (and, inevitably, debugging or adapting) technology, and understand the risks of technology (including online) as well as benefitting from it. This includes a strong emphasis on online safety, digital footprints and social media, gaming and online bullying.

The philosopher John Dewey said, "If we teach today's students as we taught yesterday's, we rob them of tomorrow". With technology moving faster than schools can teach it, it is likely that this could be a reality for all schools. Therefore, we work to ensure our pupils have transferable skills (including basic laptop navigation, presentation skills and programming) to take with them into the future of technology, as well as enthusiasm and resilience to tackle new technology and challenges with positivity and to 'find the joy in demanding work'. Our vision is for pupils to leave our school inspired, knowledgeable, skilled and equipped for the new opportunities that will arise in our modern society.

Early Years Foundation Stage (Acorn class)

In the Early Years Foundation Stage (EYFS), children actively build Computing foundations by exploring technology as it appears in their daily lives. Through Understanding the World, they develop early digital literacy, engaging with familiar devices like tablets, computers and interactive whiteboards. Communication and Language is a vital area of learning, as discussions about technology allow children to connect with real-life experiences. Moreover, the act of following instructions, especially in technology-related tasks, cultivates their logical reasoning by requiring them to understand and apply sequential steps. Physical Development, with its emphasis on fine motor skills, empowers children to control devices and confidently use touchscreens. In addition, practical data handling is introduced through engaging sorting and grouping activities, where children discover patterns, make comparisons, and categorise information. Pupils then creatively represent their findings using both digital and physical resources, laying the groundwork for essential problem-solving skills. These early experiences align with the National Curriculum for Computing, where, in Key Stage 1, pupils begin to develop computational thinking, learning basic programming concepts, digital creativity and online safety. The play-based, exploratory nature of EYFS ensures children develop curiosity and confidence in using technology, providing a strong foundation for structured computing education in later years.

Key Stage 1 (Beech and Chestnut classes)

In Key Stage 1 (KS1), pupils solidify and expand upon the foundational skills developed in EYFS, applying them to more complex concepts. They delve into the fundamentals of computer science, digital literacy and information technology. There is a strong emphasis on developing core skills in navigating and using devices and software competently (e.g. Microsoft Office, mouse and keyboard, navigating Teams). Specifically, pupils cultivate computational thinking by exploring the basics of algorithms, sequencing and simple programming through age-appropriate tools like Bee Bots and Scratch Junior, and they engage with visual programming languages, such as block-based coding, to design simple programs and tackle problems. Furthermore, pupils learn to utilise digital tools for creating, storing and retrieving information, gaining insight into technology's role in everyday life. Crucially, online safety is emphasised, equipping pupils with the knowledge to use technology responsibly, identify potential risks, and safeguard personal information.

Key Stage 2 (Fir, Holly, Maple and Oak classes)

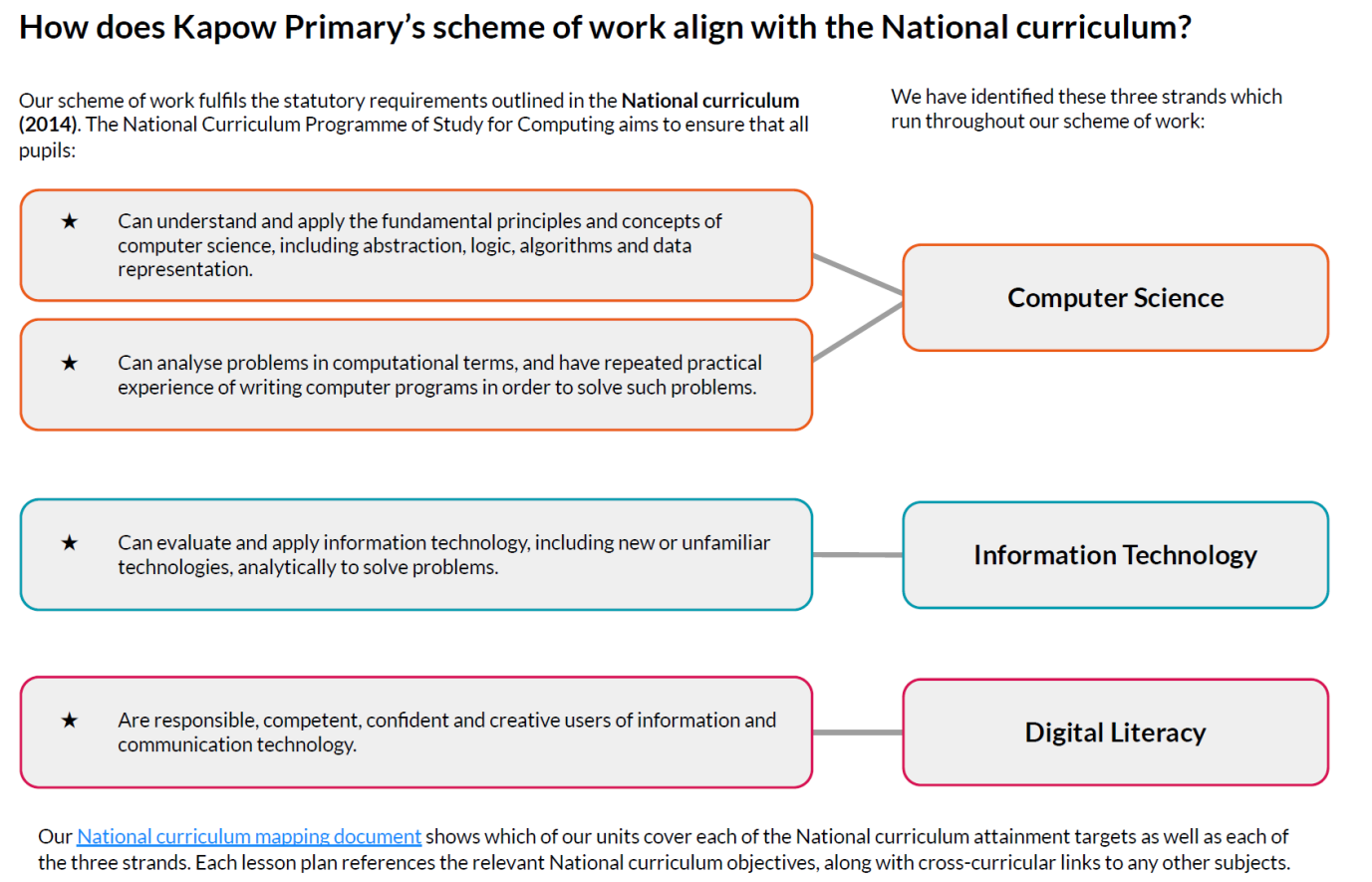
In Key Stage 2 (KS2), the Computing curriculum builds on the foundations of computer science, information technology, and digital literacy, developing pupils' ability to use technology with confidence and critical awareness. Pupils learn more advanced programming skills, including creating and debugging algorithms, and working with variables, loops and conditionals in block-based and text-based coding languages. They develop an understanding of computer networks, including the internet, how search engines function and how data is transmitted (e.g. via email). Pupils also enhance their digital literacy, using a range of software for creating, editing, and presenting digital content across different subjects. Online safety remains a key focus, with pupils learning about cyber security, responsible digital behaviour and recognising misinformation.

Building strong foundations through experiences

To complement the curriculum, there are visiting workshops, themed class events and educational visits, which enhance pupils' understanding and provide varied learning experiences. Pupils benefit from local connections to enhance their curriculum, as well as in-school technology including VR headsets and a 3D printer.

The curriculum

At Sonning, we follow the National Curriculum for all our subjects. However, we have chosen Kapow to match our ambitions for the subject. To ensure the National Curriculum is covered effectively, there is an edited version of the National Curriculum which has notes to highlight where in our Milestones, a statement or section is covered within our strategic documents and planning.



Taken from Kapow's LTP document

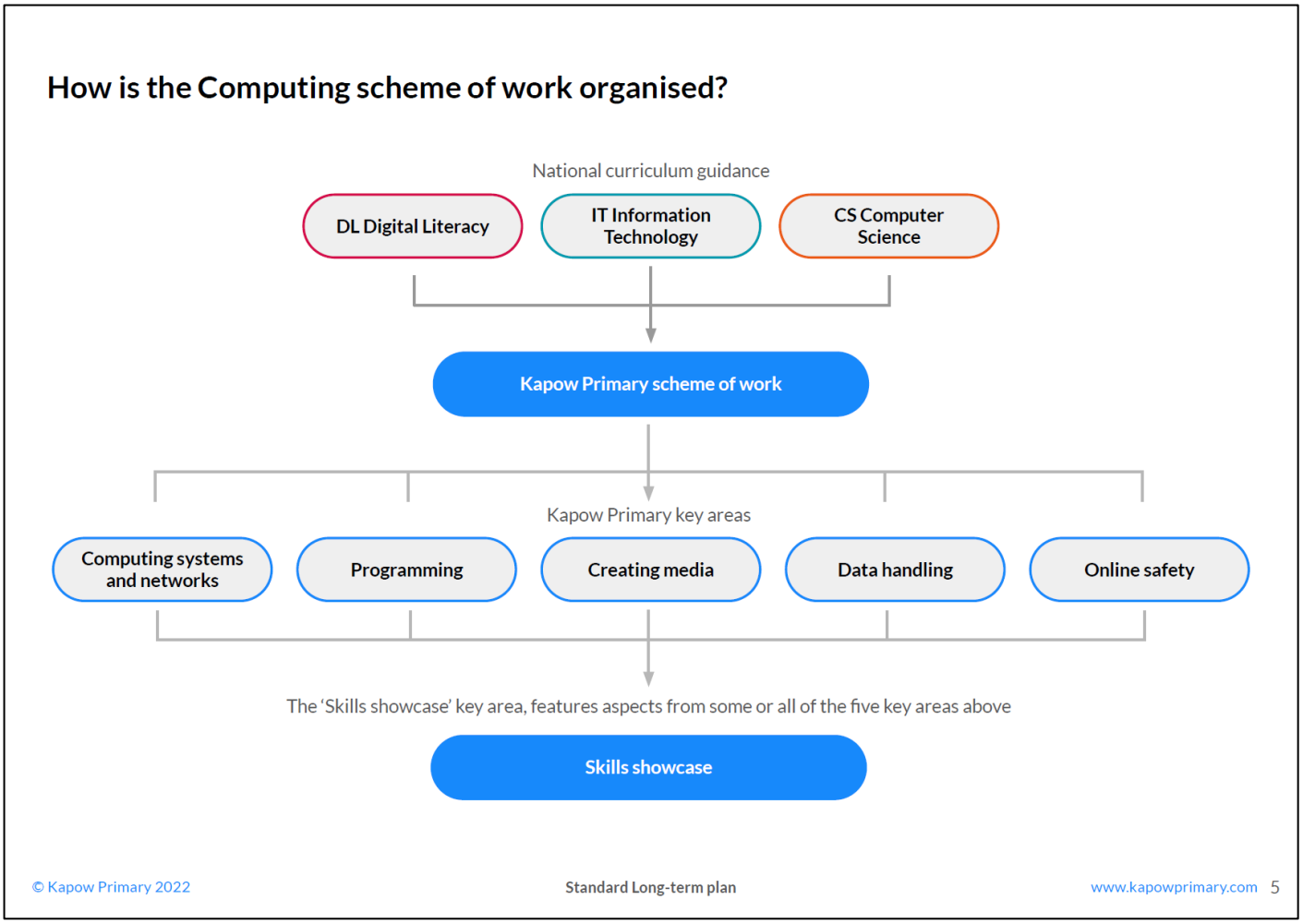
Schemes of work

In Computing, we use a scheme called Kapow to support the subject in Years 1 to 6. We also use some of the Kapow units in Early Years. We have also reviewed the Kapow progression of knowledge and skills documents to ensure that this strategic planning is appropriate for our school community and links with our curriculum vision (and the National Curriculum).

Curriculum structure

Our Computing curriculum is structured around the three pillars of Computer Science, Information Technology, and Digital Literacy, delivered through the Kapow Computing scheme. Each unit, typically spanning five lessons, is designed to systematically build upon prior knowledge and ensure regular revisiting of core skills from EYFS to Year 6. Computing is taught once per term. Then, to reinforce online safety, one dedicated lesson (or more) is integrated per half-term, alongside consistent, ongoing teaching within each unit. We employ a variety of pedagogical strategies, including

retrieval practice and knowledge organisers, to prepare pupils for each lesson and focus on key objectives. Subject-specific vocabulary is explicitly taught and deepened through effective questioning, fostering a robust understanding of computational concepts. This structured approach ensures pupils retain and expand their knowledge termly, developing the skills and understanding necessary to thrive in a digital world.



Taken from Kapow's LTP document

Concepts (aka 'key areas' in Kapow Computing)

Across all subjects, core concepts are woven through each unit and year group, ensuring consistent focus and progressive development from foundational to advanced understanding. Our Computing key concepts are as follows:

Computing Systems and Networks	Programming	Creating Media	Online Safety

Kapow expands on these concepts, which Kapow refers to as 'key areas'. These key areas are referenced below. We have chosen to focus on core skills, programming and online safety and removed the larger data handling aspect of Kapow's programme. Any National Curriculum objectives or expectations are still covered throughout our units and other Concepts.

Key areas

We have categorised our lessons into the five key areas below, which we return to in each year group making it clear to see prior and future learning for your pupils and how what you are teaching fits into their wider learning journey.

Computing systems and networks	Programming	Creating media	Data handling	Online safety
Identifying hardware and using software, while exploring how computers communicate and connect to one another.	Understanding that a computer operates on algorithms, and learning how to write, adapt and debug code to instruct a computer to perform set tasks.	Learning how to use various devices — record, capture and edit content such as videos, music, pictures and photographs.	Ensuring that information is collected, recorded, stored, presented and analysed in a manner that is useful and can help to solve problems.	Understanding the benefits and risks of being online — how to remain safe, keep personal information secure and recognising when to seek help in difficult situations.

Taken from Kapow's LTP document

Building on and revisiting learning

Our units rely on a 'spiral curriculum' model, which ensure we can revisit concepts and cumulatively build knowledge and skills.

A spiral curriculum

The scheme of work has been designed as a spiral curriculum with the following key principles in mind:

- ✓ Cyclical: Pupils return to the key knowledge and skills again and again during their time in primary school.
- ✓ Increasing depth: Each time a skill is revisited it is covered with greater complexity.
- ✓ Prior knowledge: Prior knowledge is utilised so pupils can build upon previous foundations, rather than starting again.

Taken from Kapow's LTP document

How we plan our units

We have chosen to use the Kapow scheme because it offers engaging, curriculum-aligned resources that foster a development of curiosity, skill development and critical thinking in pupils.

Prior to beginning a unit, class teachers will review all the documentation mentioned in this vision document as well as the lesson plans and online resources, in order to understand the direction of the units and lessons. It also ensures that teachers have time to address any subject knowledge gaps they have themselves, or seek support. As part of this professional development support, teachers use the teacher knowledge videos that are provided within the Kapow units to enrich and refine subject knowledge ahead of lessons.

Because of the comprehensive nature of the planning on Kapow, teachers are not expected to produce individual written plans for each lesson. However, teachers are expected to ensure that the teaching resources produced for the lesson are comprehensive and well-planned, as well as being adapted where necessary to suit the needs of the cohort.

This could take the form of the following:

- Using the pre-prepared presentations on Kapow (extra slides can be added to the deck if needed).
- If teachers prefer, they can create their own PowerPoint, ensuring the key information from the Kapow lesson is covered and add any additional slides they feel are necessary.

The most important aspect for us, as a school, is ensuring that teachers feel prepared to (and, therefore, deliver) high-quality lessons to pupils which support our vision of developing knowledge and skills over time. It also enables teachers to consider how these lessons will fit in to the wider picture of a child's learning journey.

Vocabulary development and knowledge organisers

As part of our focus on oracy, we utilise Kapow's unit plans, which outline the key vocabulary for that lesson or unit, which allows progression in vocabulary development over each unit and year.

A knowledge organiser, in line with our school's format, is shared with pupils from the beginning of the unit and referred to throughout lessons to help embed key concepts and vocabulary.

Cross curricular links

It is important to understand how subjects can work with each other, so there are specific links to other subjects where relevant. There are also opportunities throughout the years for Computing to cross over into other subjects (e.g. through experience days) to engage pupils, raise the profile of Computing and provide additional opportunities to practise core Computing skills. However, it is important to note that this does not detract from the focus we have on teaching each unit as part of a discrete subject.

Links with our values, spirituality and organisations

Our Computing curriculum, powered by Kapow's engaging resources, cultivates digital citizens who embody our school's values of curiosity, courage, respect, love, and aspiration. We spark curiosity by exploring the ever-evolving world of technology, fostering a love for learning and problem-solving. We build courage by encouraging students to experiment with coding, design, and digital creation, embracing challenges and learning from mistakes. Respect is paramount in our digital interactions, promoting online safety, responsible communication, and ethical use of technology, aligning with British Values of mutual respect and tolerance. We foster a love of learning through technology, encouraging students to explore how technology can be used to improve the lives of others. Our focus on innovation and skill development nurtures aspiration, empowering students to become creators and leaders in the digital age. Furthermore, our curriculum integrates spiritual awareness by encouraging reflection on the impact of technology on society and individual well-being. By exploring global digital initiatives and data analysis, we connect with OECD and UN objectives, promoting digital literacy, equitable access to technology, and sustainable development goals, ensuring our students are prepared to contribute positively to a connected world.

Milestones and assessment opportunities

When assessing progress, we use a range of methods, including the use of Kapow's formative and summative assessment opportunities.

Formative assessment

To begin each lesson, teachers employ targeted retrieval practice through a 'recap and recall' section. This allows for a swift assessment of prior learning, highlighting any gaps that need addressing. Throughout the lesson, ongoing formative assessment strategies are key. Teachers utilise a range of methods, including effective questioning, observation, peer and self-assessment, oracy, and presentations, to inform real-time adjustments to instruction.

Specific assessment for learning (AfL) strategies, such as providing descriptive feedback and establishing clear learning intentions, are consistently implemented and help teachers track where each child is at. These assessments not only shape immediate instruction but also inform future planning. Unit-level assessments, coupled with integrated retrieval practice, serve to consolidate learning and reinforce essential vocabulary. Ultimately, this continuous assessment cycle ensures responsive and effective teaching, tailored to the needs of each learner.

Summative assessment
Within Kapow, each unit of work assesses children's understanding and retention of key knowledge using an assessment quiz with multiple choice questions and one open-ended question. These assessment quizzes offer teachers valuable summative records, serving as evidence of pupil progression throughout the year and as they transition between key stages. In addition, each unit uses a knowledge catcher. This can be used at the beginning and/or end of a unit, and gives children the opportunity to further demonstrate their understanding of the key concepts covered.

Milestones and assessment opportunities
Clear progression and effective assessment are achieved through our milestone objectives and targeted assessment opportunities within each unit. Teachers are guided by these milestones, which are derived from the National Curriculum and cross-referenced with Kapow's progression framework, to ensure pupils develop the necessary knowledge and skills for success.

Measuring impact

We measure the effectiveness of our curriculum in the following ways:

- Pupil data tracking (Sonar and other internal tracking methods)
- Work scrutiny
- Monitoring of lessons and planning (including from SLT, governors and external validation, e.g. TKAT)
- Pupil conferencing

When evaluating our curriculum, we also ask ourselves the following questions:

Do we provide a high-quality curriculum and inspires pupils?

- To what extent do our children show independence, resilience and high aspirations in the subject?
- To what extent does our curriculum provide new experiences and challenges?
- To what extent do the children engage with high quality resources?

Do we ensure pupils know more, do more and remember more?

- To what extent do children retain the knowledge learnt?
- To what extent does the curriculum build over time?
- To what extent do children make progress against milestones over time?

Does our curriculum allow oracy development and the opportunity for pupils to collaborate?

- To what extent does our curriculum use/teach high quality language?
- To what extent does the curriculum provide opportunities to work collaboratively?
- To what extent does the curriculum support children with oracy skills?

Is our curriculum inclusive?

- How well is learning broken down, explained and scaffolded/adapted appropriately in the subject?
- How well are assessment forms used to inform planning in the subject?
- To what extent does the curriculum meet the needs of all learners including SEND/ EAL etc?

Do we help our pupils become better people in the wider world and prepare them for life in Modern Britain?

- To what extent does the curriculum allow children to take responsibility for their learning?
- To what extent does our curriculum allow for diversity?
- To what extent does the curriculum offer opportunities to present work in creative ways?
- To what extent does the curriculum offer opportunities to discuss content and/or questions and consider them in an open forum?
- To what extent does offer opportunities to utilise the skills of the wider community?

Supplementary support

We utilise the following support within our curriculum for this subject:

- Langley Grammar Computing Hub
- Forest Learning Alliance-sourced support from other Hubs
- Computing.org subscription
- TKAT subject network meetings
- Local experts and support networks (including Reading University and Reading Blue Coat School).
- Virtual Reality: Eduverse Class VR