

# Alderwood Academy – KS2 Haven – Computing Subject Policy

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## Aims and purpose

This curriculum enables pupils to become confident and efficient users of technology. The curriculum establishes the important knowledge in computing to provide a foundation for the technical nature of the subject. We aim for pupils to understand how the technology they use every day has an impact on the world around them, giving pupils the knowledge to express themselves and develop their ideas in real-world contexts.

## Knowledge and vocabulary

This principle recognises the important role that knowledge, and vocabulary as a particularly important type of knowledge, play in learning. In computing, knowledge and vocabulary are building blocks for developing confident users of technology. We identify and map vocabulary across the curriculum, both in terms of the introduction of new vocabulary and the necessary repetition of vocabulary that has gone before. New vocabulary, called keywords, are signalled in bold in our lesson materials to indicate their importance.

Being able to express themselves accurately and technically means pupils are better able to apply the knowledge they accumulate. Computing-specific vocabulary is introduced from the first lesson and definitions are developed throughout the curriculum in an age-appropriate manner. Explanations of terms are redefined as new knowledge is learnt, adding nuance and detail.

## Sequencing

A careful and purposeful sequencing of our curriculum content underpins the design of our curriculum, ensuring that pupils are able to build on and make links with existing knowledge. The computing curriculum follows a spiral model where knowledge is revisited and expanded upon regularly. This approach ensures that as their technical understanding of computing develops, pupils can tackle more complex ideas with confidence, drawing upon previous learning.

Attention is paid to vertical coherence via threads, which map the developments of concepts over time, for example, the 'Artificial intelligence' thread sees the concept of AI first appear in key stage 1 where pupils explore how it is used alongside more traditional forms of processing. Pupils will learn about how to create digital artefacts first-hand and then compare this to computer-generated artefacts. As pupils develop their computing knowledge, they then explore the use of AI from a technical perspective to provide insight into the benefits and limitations of automated generation

## Evidence-informed

Our evidence-informed approach enables the rigorous application of research outcomes, science of learning and impactful best practice both in education in general and at a subject specific level. For example, the design of our resources reflects findings from Sweller's cognitive load theory and Mayer's principles of multimedia learning whilst our lesson design draws on Rosenshine's principles of instruction. We also draw on findings from research organisations such as the Education Endowment Foundation (EEF).

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## Diverse

Our commitment to breadth and diversity in content, language, texts and media can be seen throughout the curriculum, for example, in the group of diverse school-age characters that feature in our resources. Our curriculum draws on a range of contexts, to both demonstrate the breadth of application of computing and to help pupils see relevance in the curriculum. For instance, pupils learn how computing can be used to develop early warning systems that analyse big data and real-time analytics to predict natural disasters like earthquakes, floods, and tsunamis. In a different context, they learn how fashion designers use algorithms to generate new aesthetics or create collections based on consumer data and design principles. Pupils are taught how technology can be applied now and in the future. Pupils learn that the knowledge and skills of programming is relevant beyond the development of software, and can be transferred to other fields such as social science or art. Our curriculum acknowledges the importance of open-ended problem-solving through carefully designed project tasks that enable pupils to create their own solutions, reflecting both how they work, as well as what interests and motivates them.

## Accessible

Our curriculum is intentionally designed to facilitate high-quality teaching as a powerful lever to support pupils with SEND. Aligned with EEF guidance, our resources have a focus on clear explanations, modelling and frequent checks for understanding, with guided and independent practice. Lessons are chunked into learning cycles and redundant images and information are minimised to manage cognitive load. We have removed reference to year groups in our resources so that they can be used when pupils are ready, regardless of their age. Our resources are purposefully created to be accessible, for example by using accessible fonts, colours with good contrast, captions in our videos, and when demonstrating software in our resources, using high-contrast colour options and enlarged fonts.

## National Curriculum

There are four aims of the national curriculum. The first aim is that all pupils should understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms, and data representation. This begins in key stage KS1, where pupils are introduced to the basics of algorithms by following step-by-step instructions to complete a task, such as directing a toy through a path. By key stage 2, pupils begin using block-based programming tools to create simple programs, reinforcing their understanding of abstraction and logic. As they progress to key stage 3 and key stage 4, they tackle more complex concepts like sorting algorithms and data structures in a text-based language. By the end of key stage 4, pupils should be able to independently select appropriate computer science concepts to solve real-world problems, such as creating efficient programs for a specified task.

The second aim is for pupils to analyse problems in computational terms and gain repeated practical experience in writing programs to solve them. In key stage 2 pupils are tasked with designing simple games in Scratch, which requires them to break down the game mechanics into manageable parts and use their programming knowledge to implement them. As they move into key stage 3 and key stage 4 pupils encounter problems like designing algorithms that use lists. This progression across year groups ensures that pupils have

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numerous opportunities to work with both block-based and text-based languages, from Scratch to Python, allowing them to practise and refine their problem-solving and coding skills.

The third aim is that pupils should evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems. In key stage 1 and key stage 2 pupils might explore familiar technologies like tablets or simple word processing software, understanding how they are used in everyday life and discussing their impact. By key stage 3, pupils engage with more advanced technology, such as exploring how AI tools work. This helps pupils learn how to apply technology to meet their needs and solve specific challenges. In key stage 4 pupils may analyse emerging technologies like virtual reality or machine learning, discussing their potential applications and evaluating how these technologies can be used responsibly and effectively.

The final aim is for pupils to become responsible, competent, confident, and creative users of information and communication technology. This is interwoven into all areas of the curriculum. For instance, when pupils in key stage 2 explore the nature of online resources, they are also taught about digital responsibility, such as verifying the reliability of sources and protecting personal data. In key stage 3, pupils discuss topics like cyberbullying and digital footprints, reflecting on the consequences of technology use. Throughout their schooling, pupils are regularly reminded of their responsibility to use technology safely and ethically, aligning these lessons with those from the RSHE curriculum to build a comprehensive understanding of digital citizenship.