Subject Specific SEND

Computing

Communication & Interaction	Cognition & Learning
Challenges **Pupils may:** • Difficulty understanding instructions: Struggling to follow verbal explanations or instructions given by the teacher. • Challenges in expressing ideas: Finding it hard to articulate thoughts or answers during discussions or activities. • Social communication issues: Difficulty engaging in group work or collaborative tasks with peers. **Provision** **Teaching staff do:** ✓ Simplifies instructions: Breaks down complex instructions into smaller, manageable steps. ✓ Uses visual aids: Incorporates diagrams, charts, and visual schedules to support understanding. ✓ Encourages peer support: Pairs pupils with supportive peers for group activities. **Teaching staff provide:** ✓ Visual supports: Flashcards, picture cues, and visual timetables. ✓ Alternative communication methods: Tools such as communication boards or speech-to-text software. ✓ Structured routines: Consistent and predictable lesson structures.	**Challenges** **Pupils may have:** • Understanding complex concepts: Struggling with grasping scientific concepts and theories. • Memory retention: Difficulty remembering facts, procedures, or sequences of steps in experiments. • Processing information: Taking longer to process and understand written or spoken information. **Provision** **Teaching staff do:** ✓ Scaffolding tasks: Adapts tasks to match the pupil's ability level, providing additional support or extension activities as needed. ✓ Uses multi-sensory approaches: Engages multiple senses to reinforce learning (e.g., hands-on experiments, videos). ✓ Provides regular feedback: Offers constructive and timely feedback to help pupils understand their progress. **Teaching staff provide:** ✓ Scaffolding materials: Step-by-step guides, checklists, and templates. ✓ Memory aids: Mnemonics, flashcards, and mind maps. ✓ Extra time: Additional time for completing tasks and assessments.

Social, Emotional & Mental Health	Sensory/Physical
Challenges **Pupils may have:** • Anxiety or stress: Feeling anxious about participating in experiments or answering questions. • Behavioural challenges: Difficulty staying focused or managing impulses during lessons. • Emotional regulation: Struggling to cope with frustration or setbacks in learning. **Provision** **Teaching staff do:** ✓ Creates a supportive environment: Establishes a classroom culture of respect and inclusion. ✓ Implements calming strategies: Uses techniques such as mindfulness, deep breathing exercises, and breaks. ✓ Monitors behaviour: Keeps an eye on pupils' emotional well-being and intervenes early if issues arise. **Teaching staff provide:** ✓ Safe spaces: Designated areas where pupils can go to calm down if they feel overwhelmed. ✓ Positive reinforcement: Rewards and praise for positive behaviour and effort. ✓ Access to counselling: Referrals to school counsellors or mental health professionals if needed.	**Challenges** **Pupils may have:** • Sensory sensitivities: Being overwhelmed by sensory stimuli in the classroom, such as loud noises or bright lights. • Physical limitations: Difficulty handling equipment or materials due to fine motor skill challenges. • Accessibility issues: Struggling with accessing resources or participating in activities due to physical disabilities. **Provision** **Teaching staff do:** ✓ Adapts the environment: Modifies the classroom to reduce sensory overload (e.g., using soft lighting, reducing noise). ✓ Uses assistive technology: Incorporates tools such as voice-to-text software, magnifiers, or adapted keyboards. ✓ Provides physical support: Assists with handling equipment and materials as needed. **Teaching staff provide:** ✓ Sensory tools: Items such as fidget toys, noise-cancelling headphones, or weighted blankets. ✓ Accessible resources: Large print materials, braille resources, or audio recordings. ✓ Flexible seating: Options such as standing desks, wobble cushions, or ergonomic chairs.

Computing

Planning Inclusive Lessons

Tasks

Incorporate learning materials that are accessible for learners of all abilities. For learners with special educational needs and disabilities, specific resources or approaches may be required to enable them to access the curriculum. Ensure you have considered what barriers learners may have within a lesson and embed support strategies to help them overcome these.

Scaffold learning so that learners benefit from support during initial phases of learning. Adapt tasks to make the curriculum accessible to all. For example, tools such as *CodeJumper* and *Blocks4All* can be used for learners who are visually impaired.

Problem Solving

In computer science, there can be multiple solutions to a problem. Focus your instruction and encouragement on solving problems and the problem-solving process, rather than finding a single right answer. Emphasize guided inquiry, designing learning opportunities where learners can ask questions, explore, try different approaches and challenge their own and each other's ideas.

Encourage learners to take ownership over their learning, strategies such as the 'BBBGBs' (Brain, Board, Buddy, Google, Boss) and expert learners are effective ways to embed this into lessons. If a learner struggles with complex, multi-step problem-solving, give them additional support in the beginning, then slowly remove the support once learners build their skills and confidence.

High Expectations

One of the largest subject barriers we face is learners' own belief systems about who can succeed in computer science. If a teacher holds lower expectations of a learner, it can have a negative impact on a learner's achievement in the subject.

Encourage learners to reflect on their perspectives and potential biases and challenge yourself to do the same. Build relationships with learners to identify opportunities to connect learning to their personal experience. Look for stories and experiences about using computer science that will be meaningful and relatable to your learners.

Creating an Inclusive Environment

Vocabulary

Whilst you model the skills and understanding required to develop a rich vocabulary knowledge, consider your use of words within a lesson. Familiarise learners with Tier 2 words by embedding them into classroom displays and lesson activities. It's important that you find ways for learners to encounter these terms, as this will empower them to access a higher level of language with which they can communicate and understand ideas across the curriculum.

Vision Impairment

At Key Stage 1 and 2, coding is primarily taught using block-based programming languages such as Scratch. Carefully consider what inclusive practices are appropriate. For example, embedding the use of braille, allowing learners to orient themselves to the classroom space, careful selection of colours within resources, installing a screen reader and magnifier aids. Together these approaches support learners in solving complex challenges.

Space

The learning environment is important in making learners feel included. Incorporate visuals that will appeal to a wide range of learner interests and backgrounds. Include examples of learners and professionals with disabilities, the representation of a diverse range of figures in computing can send a powerful message to your learners.

Arrange the learning space to promote collaboration and hands-on activities, whilst also being mindful of how learners will access their workstations. Arrange aisles and workstations so that learners with mobility aids can get to all the areas they need to access to participate fully.

Computing

Consider what assistive technology devices could be embedded into practice to give opportunities for all learners to fully access lesson content.

Curriculum Considerations

Computing equips learners to use computational thinking and creativity to understand the digital world we live in. Computing has deep links with mathematics, science and design and technology, and ensures that learners become digitally literate, offering the opportunity to learn in different ways.

Key Stage 1

At this stage, learning should be focused on the concept of computational thinking and equipping learners with the skills to tackle challenging problems using logical reasoning. Practical activities that encourage them to get hands-on with problems can help them visualise solutions. Giving learners the opportunity to predict behaviour of simple programs can also develop their problem-solving skills. It's important to use and to teach learners the correct technical terminology within lessons, to ensure that misconceptions are not embedded early into their computing education.

Key Stage 2

At this stage, learners begin to apply and build upon the skills learnt at Key Stage 1 through designing and writing programs that accomplish specific goals. Learners should be able to detect and correct errors in algorithms. When teaching learners to solve various problems, encourage them to be resilient and think outside the box.

Learners should also be shown how to use technology safely, respectfully and responsibly. Learners need to be able to identify unacceptable behaviour and know how to report concerns.

Key Stage 3

In Key Stage 3, learners are required to design, use and evaluate algorithms that model the state and behaviour of real-world problems. Expand learners' understanding of computational thinking through modelling and explore the different tools which can be used to efficiently solve more challenging problems. Learners will explore both block-based and text-based programming languages and will develop the difficulty of the program through using a wider variety of programming techniques. The ability to highlight and correct errors will be challenged further as learners are introduced to a wider range of errors. They will explore various software applications to undertake creative projects and practise selecting, using and combing multiple tools.

Key Stage 4

In Key Stage 4, learners will begin to develop their capability, creativity and knowledge in computer science, digital media and information technology. Learners need to focus on developing and applying their analytical, problem-solving, design and computational thinking skills. They should be able to use a wide range of technical vocabulary and be aware of how technology evolves in the world around them.

Computing

Strategies to Scaffold Learning

How can I support learners who struggle to access lessons because of literacy difficulties?

- Model the correct use of vocabulary. Show examples of common errors/misconceptions and work with learners to improve literacy within given text.
- For those with appropriate access arrangements, encourage the use of a reader to support learners in reading and interpreting large sections of text.
- Chunk key information and create clear, easy-to-follow checklists. This can help your learner focus on one section at a time and have a clear set of goals.
- During classroom discussions, listen to the answers given and when re-iterating points, rephrase sentences to include key vocabulary.
- Consider your classroom display and how you can promote the definitions and use of Tier 2 words.
- Provide learners with a glossary of key terms which they can refer to during the lesson.

How can I support learners who struggle to retain vocabulary?

- Embed opportunities to recall key terms within lessons. Memorisation techniques such as tracked retrieval practice can give learners the opportunity to revisit topics across the curriculum.
- Provides learners with a glossary of key terms which they can refer to during the lesson.
- Use rephrasing techniques to strengthen learner answers with correct vocabulary.
- Introduce new terms slowly and rehearse news words. Get learners to interact with the key terms in various ways such as writing, speaking, mini games, questioning and more.

How can I support learners who need additional time to develop conceptual understanding?

- Model answers and get learners to look at and discuss completed examples.
- Assess and use learners' prior knowledge to create links between old and new content.
- Walk through examples together, giving learners the opportunity to ask questions.
- Address misconceptions early.

How can I support learners who struggle with attention?

- Learn what hobbies or topics the learners are interested in. Find ways to incorporate this into lessons and questions. Use learners' names in written questions to further engage them in text.
- Give clear instructions within the form of a checklist. This will break down the task into more manageable chunks.
- Praise learners on their contributions and for targets met, encourage them to continue and to have a growth mindset.
- Consider the learning environment and potential distractions and make appropriate arrangements to remove these barriers.
- Ensure instructions are clear and signposted.
- Be concise in teacher-led delivery. Chunk material in larger topics so learners can complete a range of engaging activities.
- Check in with the learners throughout the activity, initially to check they have understood the task, to praise work completed and to challenge them further.

Case Study

A learner in Year 9 with ASD, articulate and passionate about computing, was anxious about change and new environments.

Transitioning into a new year, class or seating plan were changes they found particularly difficult. The learner did not like group work, sitting next to others, sharing or learning new content. The teacher embedded the following strategies into lessons to support this learner:

- *Spoke with the learner to discuss their interests and friendships. Worked with them in structuring a seating plan in advance. The learner often wanted to sit on their own and at times when this wasn't possible, the teacher spoke with them about what other options were available and gave them ownership of the appropriate solution.*
- *Pre-warned the learner about any assessments, topic changes, teacher/room changes. Pre-warned the learner about group activity, discussed with them alternative ways they could get involved.*
- *Gave the learner time out when needed.*
- *Incorporated learner's hobbies and interests into lesson content.*
- *Used praise to motivate and support the learner.*
- *Allowed the learner to work independently.*
- *Built strong positive relationships with the learner, which had the biggest impact on their engagement and willingness to try something new.*
- Provided the learner with a topic list, glossary and revision slides in advance of each term.