

## Computer Science Best Practice Grid

<p><b>What should we see in Computer Science lessons as best practice?</b></p> <ul style="list-style-type: none"> <li>- High expectations of all students – teaching from the top down rather than bottom up</li> <li>- Embedded routines to start of lessons – students log in to computers, books out, recap and retrieval</li> <li>- Excellent subject knowledge of the classroom teacher on topic being delivered</li> <li>- Health and Safety with IT equipment</li> <li>- Encouraging discussions around the subject – building cultural capital and the impact of CS in day-to-day life</li> <li>- Cross-curricular links made explicit when explaining and discussing</li> <li>- Activities and work set that provide challenge and scaffold for students to complete independently.</li> <li>- Linking back to previous learning</li> <li>- Linking forward to future learning and careers</li> <li>- Embedding Rushey Principles of Instruction</li> </ul>	<p><b>What does effective questioning and scaffolding look like in <i>Computer Science</i>?</b></p> <ul style="list-style-type: none"> <li>- Differentiated questioning</li> <li>- We do activities to scaffold and implement faded guidance throughout examples</li> <li>- Cold calling students</li> <li>- Think / Pair / Share</li> <li>- Designated thinking time</li> <li>- No opt out.</li> <li>- Hinge Questions</li> <li>- Probing questioning, getting students to expand, think about why their answer is correct</li> <li>- Deliberate questioning of incorrect answers/misconceptions to teach subject correct knowledge</li> <li>- Students demonstrating why misconceptions are wrong.</li> <li>- Use of whiteboards</li> <li>- Bouncing questions</li> <li>- Getting students to repeat correct answers</li> <li>- Demonstrating model answers for probing questions</li> </ul>
<p><b>What does great modelling and exposition look like in <i>Computer Science</i>?</b></p> <ul style="list-style-type: none"> <li>- Clear knowledge-based explanations that purposely address misconceptions and reasons why</li> <li>- Application to real world concepts that students can relate to</li> <li>- Dual Coding on PPT slides.</li> <li>- Programming to be colour coded</li> <li>- Live coding and explanations</li> <li>- Faded guidance on examples on the board</li> <li>- Examples using real scenarios and situations to enhance discussions – eg NHS Data Leak</li> <li>- Demonstrating student work to all</li> </ul>	<p><b>What does retrieval practice look like in <i>Computer Science</i>?</b></p> <ul style="list-style-type: none"> <li>- Short concise questions with a definitive answer.</li> <li>- Low stakes questioning at the beginning of the lesson</li> <li>- Evaluation questions to test knowledge from previous lessons and topics</li> <li>- Subject specific questioning on terminology (Tier 3 words)</li> <li>- Exam style questions</li> <li>- Verbal retrieval questions – probing from one concept to another</li> <li>- Time bound retrieval practice – short and sharp to only address misconceptions rather than reteach</li> </ul>
<p><b>What will you see in student workbooks?</b></p> <p><b>KS3</b></p> <ul style="list-style-type: none"> <li>- High levels of presentation             <ul style="list-style-type: none"> <li>o Title, date, highlighting, ruler</li> </ul> </li> <li>- Clear definitions of key concepts using Cornell notetaking method</li> <li>- Clear learning episodes</li> <li>- Examples/exemplars and models</li> <li>- Scaffolded questioning on Class Notebooks</li> <li>- Faded guidance on Class Notebooks</li> <li>- Mistakes and misconceptions identified and addressed on Class Notebooks</li> <li>- Summaries of lesson contents in red books</li> </ul> <p><b>KS4</b></p>	<p><b>What formative assessment and feedback will you see in <i>Computer Science</i>?</b></p> <ul style="list-style-type: none"> <li>- End of topic tests</li> <li>- Retrieval Practice - identifying mistakes and misconceptions on Class Notebook</li> <li>- Verbal feedback</li> <li>- Hinge Questions</li> <li>- Exit Tickets</li> <li>- Use of Whiteboards</li> <li>- Cold Calling</li> <li>- Effective use of circulation</li> <li>- Quizzes</li> <li>- Demonstrating student work for feedback</li> <li>- Quizlet progress</li> <li>- End of lesson summaries</li> </ul>

<ul style="list-style-type: none"> <li>- High levels of presentation</li> <li>- Keywords</li> <li>- Definitions of key concepts</li> <li>- Completed work examples</li> <li>- Cornell notetaking from videos</li> <li>- Workbooks that have definitions from homework books</li> <li>- Mistakes and misconceptions identified and addressed</li> <li>- Additional notes from teacher exposition</li> </ul>	<ul style="list-style-type: none"> <li>- Review and reteach lessons</li> <li>- Accumulative knowledge assessments</li> </ul> <p><b>KS4</b></p> <ul style="list-style-type: none"> <li>- Smart Revise (mix of MCQ, Key Terms and Exam Questions)</li> <li>- Exam based questions with mark schemes</li> <li>- Examiner reports for feedback</li> </ul>
<p><b>How is literacy taught in your subject?</b></p> <ul style="list-style-type: none"> <li>- Interpreting and investigating code to understand</li> <li>- Semantic waves in the lesson (high level terminology, real life examples, concrete examples)</li> <li>- Digital literacy – reading and analysing sources.</li> <li>- Intensive, slow reading and re-reading to analyse details</li> <li>- Reading algorithms and flowcharts</li> <li>- Create a working dictionary of topic-specific terminology and acronyms with their definitions</li> <li>- Identify all parts of code / text and their meaning</li> <li>- Reading for comprehension i.e. Year 7 Impacts of Technology</li> <li>- Reading and analysing positive and negative impacts</li> <li>- Live coding to understand concepts</li> <li>- Reading technology news and updates</li> <li>- Embedded Tier 3 vocabulary in lessons</li> </ul> <p><b>How is writing taught in your subject?</b></p> <ul style="list-style-type: none"> <li>- Note taking of Tier 3 keywords and definitions</li> <li>- Explicit teaching of programming syntax</li> <li>- Analysis of programming structure</li> <li>- Summary of learning in lesson: <ul style="list-style-type: none"> <li>o Explanation of why things work the way they do</li> <li>o Sentence signposting</li> <li>o Because/but/so</li> </ul> </li> <li>- Providing frameworks for: <ul style="list-style-type: none"> <li>o Writing code</li> <li>o Quality Written Communication answer</li> </ul> </li> <li>- Edit and review Cornell notes to add additional information</li> <li>- Explicit teaching of programming conventions</li> </ul>	<p><b>How is Oracy taught in your subject?</b></p> <p><b>Learning to talk</b></p> <ul style="list-style-type: none"> <li>- Sentence starters / talking prompts</li> <li>- Teacher modelling high quality answers</li> <li>- Use of thinking aloud</li> <li>- Use of tier 2/tier 3 vocabulary</li> <li>- Clear and concise explanations</li> <li>- Expectations of high-quality oracy</li> </ul> <p><b>Learning through talk</b></p> <ul style="list-style-type: none"> <li>- Turn and talk</li> <li>- Think / pair / share</li> <li>- Follow up questioning</li> <li>- Discussion of code</li> <li>- Discussing literature on a given topic</li> <li>- Collaborative group talk</li> <li>- Cold – calling</li> <li>- No opt out.</li> <li>- Pose, pause, pounce, bounce</li> <li>- Programming PEEEPs (Point, Evidence, Explain, Evaluate, ) <ul style="list-style-type: none"> <li>o What do you think line x will do?</li> <li>o What is the evidence for that/why do you think that?</li> <li>o Explain what that means/what does that mean?</li> <li>o Could this line of code mean anything else/how else could we interpret this line of code/do you agree/disagree?</li> </ul> </li> </ul>
<p><b>What does meeting the needs of SEND, NTE, emerging readers and PP students look like?</b></p> <ul style="list-style-type: none"> <li>- Keyword Booklets</li> <li>- See it, Say it, Highlight strategies</li> <li>- Annotated Seating plans</li> <li>- Scaffolded sentence starters</li> <li>- Immersive reader during retrieval</li> <li>- Immersive reader during assessments</li> <li>- Access to headphones during assessments</li> <li>- Annotation of keywords</li> </ul>	<p><b>What questions are useful to ask the children about their learning to elicit understanding?</b></p> <ul style="list-style-type: none"> <li>- What are you learning about today?</li> <li>- Can you give me an example of what you are learning today?</li> <li>- How does this link with previous lessons?</li> <li>- How does the recap help you?</li> <li>- What does (<u>key term</u>) mean?</li> <li>- Why is this wrong?</li> </ul>

<ul style="list-style-type: none"> <li>- Synonyms, prefix and suffix explanations</li> <li>- Differentiated questioning</li> <li>- Use of keywords during lesson summary</li> <li>- Opportunities to read the Rhyme Bot</li> <li>- PRIMM methodology when teaching programming</li> <li>- Programming cheat sheets and prompts</li> <li>- Programming to be colour coded</li> <li>- Verbal feedback</li> <li>- Use of whiteboards</li> <li>- Use of strategies identified in advice cards for SEND</li> <li>- Highlighting and defining of Tier 2 keywords.</li> <li>- Syllabification of Tier 2 &amp; Tier 3 keywords.</li> <li>- Allowing extra time during assessments</li> <li>- Gap fill activities</li> <li>- Use of videos and dual coding to support learning</li> <li>- Dividing text into accessible sections.</li> <li>- Simplification of words to be age appropriate</li> <li>- Allowing to give a spoken response rather than written</li> <li>- MCQ during retrieval with opportunities for reading.</li> <li>- Teaching abbreviations of key concepts</li> </ul>	<ul style="list-style-type: none"> <li>- How would you improve your answer?</li> <li>- Why are you learning this?</li> <li>- Explain how/why you got your answer</li> </ul>
<p><b>Links</b></p> <p><b>Books</b></p> <ul style="list-style-type: none"> <li>- The Digital Adventures of Ava and Chip</li> <li>- Bletchley Park Brain Teasers</li> </ul> <p><b>Podcasts</b></p> <ul style="list-style-type: none"> <li>- Spark with Nora Young</li> <li>- Twit: This Week in Tech</li> </ul>	<p><b>How do teachers in <i>Computer Science</i> engage with the subject community?</b></p> <ul style="list-style-type: none"> <li>- Social Media groups.</li> <li>- Subject Improvement Forum</li> <li>- CPD events</li> <li>- Newsletters</li> <li>- Hello World subscriptions</li> <li>- Computer Science teacher books</li> <li>- BETT show</li> <li>- OCR exam review sessions</li> </ul>