1. Preconceptions: Build on the ideas that pupils bring to lessons
   - 1a: Understand the preconceptions that pupils bring to science lessons
   - 1b: Develop pupils’ thinking through cognitive conflict and discussion
   - 1c: Allow enough time to challenge misconceptions and change thinking

2. Self-regulation: Help pupils direct their own learning
   - 2a: Explicitly teach pupils how to plan, monitor, and evaluate their learning
   - 2b: Model your own thinking to help pupils develop their metacognitive and cognitive knowledge
   - 2c: Promote metacognitive talk and dialogue in the classroom

3. Modelling: Use models to support understanding
   - 3a: Use models to help pupils develop a deeper understanding of scientific concepts
   - 3b: Select the models you use with care
   - 3c: Explicitly teach pupils about models and encourage pupils to critique them

4. Memory: Support pupils to retain and retrieve knowledge
   - 4a: Pay attention to cognitive load—structure tasks to limit the amount of new information pupils need to process
   - 4b: Revisit knowledge after a gap to help pupils retain it in their long-term memory
   - 4c: Provide opportunities for pupils to retrieve the knowledge that they have previously learnt
   - 4d: Encourage pupils to elaborate on what they have learnt

5. Practical Work: Use practical work purposefully and as part of a learning sequence
   - 5a: Know the purpose of each practical activity
   - 5b: Sequence practical activities with other learning
   - 5c: Use practical work to develop scientific reasoning
   - 5d: Use a variety of approaches to practical science

6. Language of Science: Develop scientific vocabulary and support pupils to read and write about science
   - 6a: Carefully select the vocabulary to teach and focus on the most tricky words
   - 6b: Show the links between words and their composite parts
   - 6c: Use activities to engage pupils with reading scientific text and help them to comprehend it
   - 6d: Support pupils to develop their scientific writing skills

7. Feedback: Use structured feedback to move on pupils’ thinking
   - 7a: Find out what your pupils understand
   - 7b: Think about what you’re providing feedback on
   - 7c: Provide feedback as comments rather than marks
   - 7d: Make sure pupils can respond to your feedback

Teaching for engagement