

What it looks like in practice

Nine routines teachers described on social media.

ROUTINE, AS TEACHERS DESCRIBE IT	WHAT YOU WOULD NOTICE	WHAT THE EVIDENCE SAYS
<p>Predict, explain, then observe</p> <p>Learners write a prediction and a reason. Every idea goes on the board. Then they observe. The mismatch is the work.</p> <p>“Whole series of Predict, Explain then Observe experiments to follow. This is teaching students Monitoring, Evaluation and Planning. Metacognition in action”</p> <p>@alexbclearning</p>	<p>Reasons on the board before the demo starts. A copper-and-ice surprise named out loud. UK secondary science, Let's Think / CASE. Teachers write predict, explain, observe. They do not write the acronym.</p>	<p>White and Gunstone (1992) published Predict Observe Explain with the observation in the middle. The live UK move puts the explanation first, so the observation has a written idea to correct. That sequence is a teacher report, not a trial of this classroom.</p>
<p>Teach, demo, hypothesise, then decide</p> <p>Fully teach the theory. Demo. Ask for a hypothesis. Do the practical only if it is still useful.</p> <p>“His advice was to fully teach theory, demo, hypothesise, then, if deemed to be useful, do the practical!”</p> <p>@MistypeaTam</p>	<p>A hypothesis after the idea is taught, not instead of teaching. UK science teacher, reporting a CogSciSci slot.</p>	<p>Abrahams and Millar (2008, DOI 10.1080/09500690701749305): in 25 English secondary practicals, learners reliably did the right things with the kit and far less reliably thought with the intended ideas. A practical used to introduce the idea is the thing that paper found weak.</p>

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<p>The Slow Practical</p> <p>Gather the class at a demo desk. Teach one step. Learners do only that step. Repeat. No method sheet to race through.</p> <p>"If you aren't doing the Slow Practical, students will Learn close to zero Spend lots of time chatting Make a mess"</p> <p>@adamboxer1</p>	<p>A queue at the demo desk, not twenty different paces. Questions on the idea at each step. UK science teacher and vendor.</p>	<p>Boxer set the steps out in Education in Chemistry (26 Aug 2020). Abrahams and Millar (2008) is the paper underneath the claim that kit-work does not by itself produce the idea.</p>
<p>Rushed required practicals</p> <ul style="list-style-type: none"> ● objection <p>Run the required practical at pace so the kit is done, then hope the written-paper items follow two years later.</p> <p>"Issue with required practicals is how rushed we are. Are we really giving opportunities to hone skills?"</p> <p>@sciantificnew</p>	<p>A crowded lesson. Skills named as not honed. UK science lead practitioner. Nobody said "no time for metacognition" as a phrase.</p>	<p>Ofqual (March 2015): at least 15 percent of GCSE science marks are questions that draw on practical experience, in written papers, not a coursework mark. A rushed kit lesson is a high-cost way to miss those items. The time objection is this, not a missing reflection sheet.</p>

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<p>Hinge item, then say the reason</p> <p>At ASE 2026, Ed Walsh is heard on hinge questions to make practical science more effective. Do not stop at a flashed letter. Ask for the next step or the reason.</p> <p>“A brilliant session from Ed Walsh this morning, exploring hinge questions and how they can be used to quickly identify gaps in knowledge and effectively guide the lesson.”</p> <p>@theASE</p>	<p>A four-option item mid-practical. Then talk. The same month, a North London science teacher says he does not believe in the term and prefers check and consolidate.</p>	<p>EEF Improving Secondary Science (2018) recommendation 2c asks for metacognitive talk and dialogue. The report names diagnostic questions at hinge points, and BEST as a source of those questions. It does not use the phrase hinge question. Keep the item if it forces a reason. A letter on a board is retrieval. The reason is the consolidate half.</p>
<p>Concept cartoon, then one variable</p> <p>Show a concept cartoon. Learners pick a viewpoint and say why. Then change one variable to test the hypotheses they just gave.</p> <p>“They then also completed little experiments by changing one variable to prove or disprove children's hypotheses in a concept cartoon.”</p> <p>@Broadoak_Year6</p>	<p>Speech bubbles, then a small circuit test. Greater Manchester Year 6. The classroom photographs are not used.</p>	<p>EEF Improving Primary Science (2023), recommendation 2: encourage learners to explain their thinking, verbally or in writing. The report names concept cartoons as cartoon-style drawings that put forward a range of viewpoints, including everyday misunderstandings.</p>

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<p>Predict, test, change your thinking (US)</p> <p>Ask a question. Write a prediction. Test it. Look at the evidence. Change the idea when the evidence tells you to.</p> <p>"Ask a question. Make a prediction. Test it. Look at the evidence. Change your thinking when the evidence tells you to."</p> <p>@CSDCrier</p>	<p>An 8th grade lab script in those verbs. North Carolina charter. The named phrase Predict Observe Explain barely appears in US K-12 science posts.</p>	<p>This is the US variant of the UK predict-explain-observe move, in classroom English, not in White and Gunstone's acronym. Labelled United States. Not a UK diary.</p>
<p>Inquiry as the default (US)</p> <ul style="list-style-type: none"> ● objection <p>Run NGSS inquiry PD, or unguided Gizmos, on the grounds that science must be discovered.</p> <p>"The most common misconception in science education is that it must be inquiry-based."</p> <p>@SciInTheMaking</p>	<p>A US science teacher arguing that novices lack the knowledge experts use. @DrLauraReames says Gizmos help with explicit instruction and scaffolding.</p>	<p>Abrahams and Millar (2008) found few English practicals were designed to link observables to ideas. That is a UK classroom study, not an NGSS trial. The objection is about mandated inquiry, not that reflection is only for honors classes.</p>

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<p>Science probe, then recorrect (US)</p> <p>Open the week with a science probe. On Friday, revisit it. Learners correct the old idea, then tell a partner who they now agree with and why.</p> <p>"We wrapped up our learning on Natural Changes by reviewing the Science Probe from the beginning of the week. My students corrected their misconceptions before sharing with their PB&J partners!"</p> <p>@msambriz3</p>	<p>A board prompt: after the new learning, who do you agree with and why, write your new thinking. Texas 3rd grade. The photographed board is not used.</p>	<p>Page Keeley probes are NSTA products, so district PD that names her is vendor-adjacent. The classroom scene is the teacher's own account. EEF Improving Secondary Science (2018) cites BEST-style diagnostic questions for the same job in UK secondary: surface the everyday idea, then force a reason.</p>

The evidence includes Abrahams and Millar (2008), DOI 10.1080/09500690701749305; Ofqual's 15 per cent rule from 3 March 2015; and EEF Improving Primary Science recommendation 2 from the 2023 guidance. These routines are teachers' own accounts, not trial evidence. @adamboxer1 is a classroom teacher and a vendor.