



Science leadership tools: lesson observation framework

Introduction

As science subject leader, it is important that you find out what is happening in science across your school. Including lesson observations in your quality assurance programme will enable you to identify strengths and areas to develop across the school. Lesson observations can be very time consuming so you will need to work with your senior leadership team to ensure that you are given the required time to carry out this useful activity. There are many approaches to lesson observations and your school may well have an agreed policy for lesson observations that you should adhere to.

Top tips



- **Communicate with the teacher**

Well in advance of the observation share the objectives with the teacher – what is it that you are wanting to learn more about? Share the lesson observation pro forma that you will be using so that the teacher is clear on what you will be looking at.

- **Build a dialogue**

One or two days before the observation have an informal conversation with the teacher about their plan for the lesson, giving them an opportunity to verbalise their ideas and ask any questions they might have.

- **Stay focused**

Observing a lesson can be quite overwhelming – there is so much going on – breakdown the lesson into different elements and focus on one at a time: managing the learning environment, lesson structure, implementation, and science content.

- **Prompt review**

Make time to review the lesson with the teacher on the same day. Not only will you both have a better recall of the lesson, but it will prevent the teacher becoming anxious and stressed.

- **Criticism sandwiches**

It is always difficult to give and receive constructive feedback but one way to make it easier is to always start by discussing a positive aspect of the lesson, then address the aspect of teaching that you would like them to work on, and finish with another positive point from your observation.

- **Support the next steps**

Once you have identified an area for development, find ways to support teachers in developing practice to address these concerns. You could arrange peer observations, team teaching, share relevant reading material/links to useful websites, organise collaborative lesson planning sessions or direct the teacher to CPD opportunities beyond the school (online and direct courses).

Possible framework for science lesson observations

This template is based on an evidenced-based research project to develop a classroom observation instrument specifically for STEM teaching (Walkington and Marder, 2013). This observation protocol was designed to specifically inform STEM teacher education with the purpose of evaluating STEM teaching and professionally developing and tracking the quality of STEM teaching. It focuses on four key aspects of the lesson: classroom environment, lesson structure, implementation and science content.

Walkington, C., & Marder, M. (2014). Exploring excellence in teaching using the UTeach Observation Protocol: Connecting teaching behaviors to teacher value-added on assessments measuring conceptual understanding. In T. Kane, K. Kerr & R. Pianta (Eds.), *Designing teacher evaluation systems: New guidance from the Measures of Effective Teaching project* (pp. 234–277). San Francisco: Jossey-Bass. https://uteach.utexas.edu/sites/default/files/Walkington_MarderMET2_013.pdf.

Lesson observation template

Teacher:	
Observation date:	Time:
Post observation interview date:	
Subject:	Class:
Observer:	

Lesson description

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Classroom environment	
Indicator	Observation
Classroom engagement: The teacher creates a learning environment where pupils generate ideas, questions and opinions that indicate their engagement with, and exploration of, the science concept(s) being addressed in the lesson.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Classroom interactions: Pupil interactions show productive working relationships with a shared responsibility for their learning. Good systems are in place to support paired and group discussing and collaborative work.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Pupils on-task: The majority of pupils are on task throughout the lesson.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Classroom management: The teacher has created a classroom environment to support the learning of the science concept(s) being addressed in the lesson. This might include entry routine, seating plan, transitions, non-verbal interventions, and other systems for effective learning . Where appropriate for science learning to be taken outdoors, systems are in place to ensure effective learning takes place in an unusual environment.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Classroom organisation: The classroom is organised so that pupils can easily work collaboratively, and access resources and equipment as needed, and the teacher can easily move between pupils and groups to support, direct, and facilitate learning for all. Where appropriate for science learning to be taken outdoors, the teacher demonstrates the same standard of organisation.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Classroom equity: The classroom environment established by the teacher addresses issues related to access, equity and diversity for all pupils. The teacher has established systems, materials and resources that meet the needs of all pupils .	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed

Summary

Lesson structure	
Indicator	Observation
Lesson sequence: The lesson is well organised and structured with learning objectives and working scientifically skills development focus that are shared with pupils at an appropriate point in the lesson. The sequence of the lesson is structured to build pupils understanding, develop their skills and maintain a sense of purpose.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Lesson importance: The structure of the lesson allows pupils to engage with and explore important big ideas in science to secure their scientific understanding.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Formative assessment: The teacher plans regular opportunities to implement a variety of assessment strategies to gauge pupil understanding of scientific concepts and aspects of working scientifically.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Working scientifically: The lesson includes an opportunity for pupils to develop their working scientifically skills through an enquiry-based or a problem-based approach to big ideas in science. Some aspect(s) of enquiry work is child-led, where pupils make their own decisions about lines of enquiry, practical approaches, and data analysis methods.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Resources: The teacher has collected and utilised resources appropriate for the lesson including, wherever relevant, measuring equipment for pupils to collect data to help them answer scientific questions.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Teacher reflection: The teacher is critical and reflective about their practice after the lesson, recognising strengths and weaknesses in their teaching. Reflection is used to inform forward planning of future science lessons.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Summary	

Implementation	
Indicator	Observation
Questioning: The teacher uses questioning strategies to encourage pupil participation, assess knowledge and skill development, and facilitate critical thinking with the science concept(s) being explored in the lesson.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Involvement: The teacher involves all pupils in the lesson by calling on non- volunteers, facilitating pupil-pupil interaction and regularly interacting with less confident pupils.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Modification: The teacher uses formative assessment effectively to understand the progress of all learners and makes required modifications to the lesson should it become apparent that groups of pupils have not understood the concept(s) being covered.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Timing: An appropriate amount of time was devoted to each part of the lesson.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Connections: The teaching strategies and activities used in the lesson helped pupils connect new learning to prior knowledge and experience.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Safety: The teaching strategies included safe, environmentally appropriate, and ethical implementation of working scientifically practices.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Summary	

Science content	
Indicator	Observation
Significance: The science content of the lesson was significant, worthwhile and in line with age-related expectations indicated in the National Curriculum. Activities chosen by the teacher are appropriate for developing the required level of scientific understanding and skills.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Fluency: Concepts and skills communicated through direct and non-direct instruction by the teacher are consistent with secure understanding and fluency with the science concept(s) of the lesson. Teachers demonstrate a fluent use of examples, discussion and explanations of concepts.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Accuracy: Written and verbal science content shared by the teacher through presentations, instruction, resources and written feedback is always accurate.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Summative assessment: Formal assessments used by the teacher are consistent with objectives of the lesson. This could include homework, tests, quizzes, etc.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Abstraction: Where appropriate, teachers utilised elements of scientific abstraction to support children in understanding abstract concepts – this might include multiple forms of representation including verbal, graphic, symbolic, visualisations, simulations, and models of systems and structures that are not directly observable.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Relevance: During the lesson, it was made explicit to pupils why the content is important to learn.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Interconnections: Appropriate connections were made to other areas of science and the wider curriculum.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Societal Impact: During the lesson there was discussion about how the science themes being explored are connected to history, current events or relevant 'real- world' problems.	<input type="checkbox"/> Strength of lesson <input type="checkbox"/> Observed often <input type="checkbox"/> Observed rarely <input type="checkbox"/> Not observed
Summary	

Strengths

Areas for development
