

# Inclusion

## Science



# Inclusive teaching and learning approaches

Let's move away from stereotyping and fixed-ability thinking about what learners with SEND can achieve. Where differentiated lesson planning leads to learners recognising, they are forever stuck on the red table for low prior attainers, or consistently given the bronze activities for in-class completion never the gold, (or the 'mild' never the 'spicy' or the 'hot') then we limit expectations of what these learners can achieve. Consideration of learners with SEND who find learning tricky must be core to planning and teaching, not peripheral.

*It is tempting to talk about the challenge of SEND as a specific and distinct issue. Yet, far from creating new programmes, the evidence tells us that teachers should instead prioritise familiar but powerful strategies, like scaffolding and explicit instruction, to support their pupils with SEND. This means understanding the needs of individual pupils and weaving specific approaches into every-day, high-quality classroom teaching – being inclusive by design not as an after-thought.<sup>5</sup>*

## 1. Ban the average

Banning the idea of 'average' is an important step towards adopting a more inclusive approach to teaching. Instead of quickly categorising learners with SEND as 'below average', the successfully inclusive teacher realises the notion of an average, above average or below average learner **is not helpful**. The inclusive teacher challenges that mindset that seeks to predetermine the capacity of each learner, replacing it instead with a **curiosity** about what the learner can achieve.

As teachers we should approach teaching with a sense of openness, looking to be surprised by our learners and what they can achieve. We cannot develop quality teaching unless (and until) we challenge this oversimplification.

## 2. Think about transforming learners' lives as the job

Reframe how you approach your role as teacher. It is one that transforms lives, rather than simply 'topping up' knowledge. Plan and teach based on the belief that futures are not predetermined by innate ability, and that every learner can make progress given the opportunity. Work with learners as co-agents in learning. Commit to nurturing trust between you as the teacher and your learners.

*'Success for all ...depends in large part on a belief that children learn to high levels'.<sup>6</sup>*

## 3. Difficulties in pupil learning are a professional challenge

As teachers we can be influential change agents in transforming schools if we regularly reflect on our pedagogical practices. Look for improvements that will help all learners reach their full potential. Barriers to learning simply present an opportunity to develop new ways of working, rather than a 'problem with the learner'. A complex learner presents a professional opportunity to learn!

## 4. Learners are pilots, not passengers

A study of 4000 fighter pilots to identify the 'average size' for cockpit design discovered that on a ten-point criteria, not a single one was the same on every dimension. These 'jagged profiles' are applicable to learners in the classroom. Difficulty with maths does not mean a struggle in literacy; poor working memory might not mean poor articulation. When you recognise these spikey or jagged profiles, there is less risk of labelling and a greater opportunity to identify learner potential.

## 5. Less deficit labelling, more ability profiling

Good teaching requires adopting an individual, holistic view of each learner. Be wary of labelling learners with their diagnosis or behaviour trait, or by assumptions of what they cannot do, particularly learners with SEND. Such labels reinforce stereotypes and lower expectations of what they can achieve. Instead of describing learners with autism as having difficulties making friends, or dyslexic learners as reluctant writers, profile learners by what they **can achieve** and how they **can learn**.

Catch yourself quietly if you label or limit a learner by the language you use, but positively reinforce yourself and your colleagues when remarks are made about what a learner can do (rather than what they cannot).

## 6. Ask better questions (be a detective in classroom)

Adopt an inquiry mind-set. This is about asking investigative questions around the learner. What do I know about how this particular child or young person learns? What are their strengths in maths and how do they differ in geography? What are successful hooks to get them interested? What motivates them to learn? What aspects of their learning behaviours need to be developed? This helps break the cycle of starting with questions about what we know about a learner's diagnosis or condition.

## 7. Catch your learners doing the right thing

Notice a learner's strengths and build on these, however small.



# Quality Inclusive Pedagogy

## Everybody learning!

When we use the phrase 'Quality First Teaching', we refer to key principles that underpin best practice. In this section, we will focus on the principle of **inclusive pedagogy**, addressing the values, attitudes and approaches that ensure mainstream classrooms are geared towards supporting those who find learning difficult.

Inclusive pedagogy is an approach to whole-class teaching that is accessible to **all learners**. It should enable learners to keep up, feel included, progress and be successful. This approach should foster an open-ended view of each individual's potential to learn and recognises the difference between individuals as a given and a strength. It challenges deterministic approaches that exclude certain learners from a positive classroom experience because of adverse labelling by ability, or by diagnosis.

As teachers we can feel disempowered by the expectation to teach learners with such a variety of needs.

However, we do not need to become experts in every SEND diagnosis to succeed. We do need to seek to know each learner, to find out how they learn best, and then seek to create classroom strategies that maximise their learning. By thinking about quality in this way, mainstream classrooms can become environments where teachers can plan, teach and assess for **all** their learners with equal confidence.

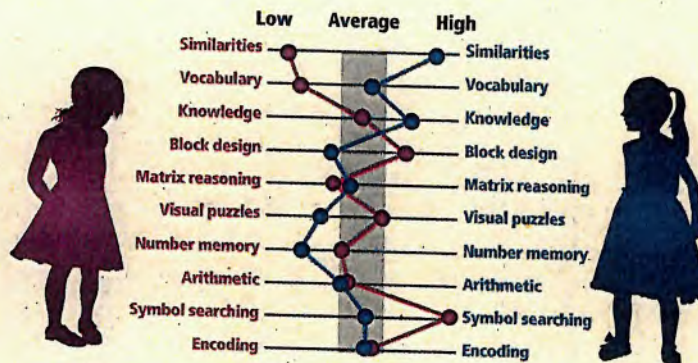
*The notion of inclusive pedagogy is not a call for a return to a model of whole-class teaching where equality is notionally addressed by providing identical experiences for all. Instead, it advocates an approach whereby the teacher provides a range of options which are available to everybody. Human diversity is seen within the model of inclusive pedagogy as a strength, rather than a problem, as children work together, sharing ideas and learning from their interactions with each other. The inclusive pedagogical approach fosters an open-ended view of each child's potential to learn.<sup>1</sup>*

## Why Inclusive Pedagogy is prerequisite for Quality First Teaching

We are moving away from an approach that views learners with SEND as outliers that always need to be catered for and taught differently. Separating learners with SEND out for numerous interventions or over-relying on teaching assistants to deliver teaching to a group of learners with identified SEND, can in fact be detrimental. Evidence tells us the most important contribution to improved outcomes for learners with SEND is quality teaching.<sup>2</sup>

We are also seeing an increase in the co-occurrence of needs exhibited by children and young people. Research tells us there are increasing numbers of learners in mainstream who demonstrate complex SEND profiles due to a number of factors (e.g., better neonatal care and more complex conditions affecting neurodevelopment).<sup>3</sup> More and more learners have what might have been described as spiky or jagged learning profiles.

The new Education Inspection Framework (EIF) reflects this shift too. It no longer looks at SEND as a department or additional provision within the school, but reviews teaching of learners with identified SEND within each subject area and every classroom. It requires evidence of SEND teaching that permeates curriculum delivery, 'built in' not bolted on.



*There is a new generation of children with complex learning needs, who do not fit neatly into an understandable category.<sup>4</sup>*

Professor Barry Carpenter

## What do we need to change?

We need to focus on academic engagement for learners with SEND to achieve genuine inclusion and strengthen learner achievement. Learners with SEND need access to the best teachers and the strongest teaching. Currently, many mainstream school processes focus on the social and emotional aspects of inclusivity rather than zooming in on the teaching and learning process.

Inclusive pedagogy can improve this. Responsibility for effective teaching and assessment of learners with SEND should not be the isolated preserve of the SENCO. Teachers are the key to progress. Teachers are generally supportive of the principles of inclusion, yet anxious about working with an increasingly diverse range of learners. Adopting an inclusive pedagogy offers a way of thinking about effective whole class teaching and meeting the needs of individual learners. Research has helped highlight the reliance on planning and teaching for the majority of learners who learn typically, and then doing something slightly different for the outliers: those at the top or bottom of the distribution curve (who are sometimes described as lower or higher attainers). Inclusive pedagogy highlights the flaws in this teaching, that default thinking of planning for most of the class and then doing something additional or different for some. 'Most' and 'some' thinking risks limiting our belief in what young people can achieve. Inclusive pedagogies encourage us to build in, not bolt on.

## Planning Inclusive Lessons

Learning in science involves children and young people building their knowledge of important concepts and procedures. When learning new content, learners must connect this to what they already know. This means that it is important that learners develop secure understanding of previously taught concepts and procedures.

When planning lessons, it is important to consider learners with SEND. Carefully consider the objective of each individual lesson; what specifically do you want pupils to learn? How can you present new information in a way that all learners can access? How can complex ideas be broken down into simpler parts for pupils to learn and practice? How can you focus learner's attention on the new content? For example, learners could observe and explore a stimulus to hook them into the new learning. This could be an object, a model, or an image. You should encourage learners to ask questions about their learning and build in opportunities for small group and whole-class discussions. Oracy-led sessions, with visuals to support the access of all learners, can enable you to build on and extend your learners' scientific thinking. If you have an additional adult in the lesson, plan their role and share their responsibilities with them in advance. Further guidance on how you can deploy additional adults is provided [here](#).



## Creating an Inclusive Environment

Carefully consider the classroom – can all learners access the environment? Consider learners with sensory impairments and physical disabilities.

In creating a conducive learning environment, it is important for each lesson to follow on from prior learning, this can be both from the lesson before, or the academic year before. The curriculum can enable this by making sure that key concepts and procedures are systematically developed over time. Identify possible misconceptions that learners may have, and plan for how you will address these in the lesson. It is also important that curriculum plans try to pre-empt misconceptions by making sure content is taught in a logical order. Create opportunities to pre-teach, providing some learners with the opportunity to learn new vocabulary and concepts in advance of a lesson in a small group setting. Pre-teaching opportunities can also support learners who struggle with transitions or engaging in whole class teaching sessions, as it can prepare them for the learning and practical elements, they are likely to experience in a lesson.

Meticulously plan, and always test practical experiments before the lesson. Use your practice to create step-by-step instructions, which you can then modify with visuals and/or more precise steps for learners needing additional guidance. Make sure learners understand the purpose of each step and that they can link scientific content to what they are doing. The instructions can also be useful for additional adults supporting the lesson, giving them increased confidence when supporting the learning.

## Curriculum Considerations

Working scientifically is an important goal of science education. It improves a learner's cognitive, social and linguistic development whilst becoming more inquisitive and interested in the world around them. Skills that are underpinned by scientific knowledge range from making predictions and asking scientific questions, to drawing conclusions and interpreting data or information collected.

As learners progress through each key stage, their knowledge of the methods, processes and nature of science is developed and deepened.

### Key Stage 1

Key Stage 1 learners should regularly experience first-hand practical activities to explore and spark their interest for the topic. Scientific enquiry weaves throughout the whole of the Key Stage 1 curriculum, so practical activities should be considered which support and develop their understanding of scientific ideas. Secondary sources such as books, photos, videos and simulations should be used to help children and young people learn and make sense of the scientific content.

### Key Stage 2

In lower Key Stage 2, learners should now be encouraged to broaden their scientific view of the world around them through exploration, discussion, testing and developing ideas.

In upper Key Stage 2, learners begin to learn about more abstract concepts which support learners in comprehending and predicting how the world around them works. Learners should continue to build on the foundational skills of exploration and talking about their ideas; asking their own questions; analysing functions, becoming methodical when identifying relationships and interactions.

## How can I support learners who struggle with attention?

- Create a working classroom environment that is calming and simple, e.g., clear routines, organised workspaces.
- Use preferential seating and proximity to engage all learners – have learners who struggle to concentrate at the front of the class, or plan for a teaching assistant to encourage the learner to participate and maintain focus.
- Pre-expose learners to the equipment and nature of the lesson (especially for experiments and practical lessons) to spark engagement and interest in the upcoming lesson.
- Plan movement breaks and classroom jobs (e.g., handing out materials) for individual learners.

## How can I support learners who struggle with change and transition?

- Science doesn't always follow the same lesson format and structure, so prepare learners in advance by explaining how the lesson will run.
- Use visuals (e.g., now, next, then boards or visual timetables) to segment the lesson into manageable chunks that are achievable for the learner.
- Think about the individual learner – some learners may be highly motivated if they know something in advance of a lesson. Show them an object, or picture about the lesson, as detailed in the case study.

### Case Study

#### Supporting a learner with autism in mainstream Year 1 science lessons

One of the learner's targets was to initiate and sustain attention to a given task. Following discussions with the SENCO, a Now, Next, Then board (NNT) was created and implemented across all areas of the school day to help structure lessons and support the learner's engagement in modified tasks aligned to the Year 1 curriculum. The NNT had three images for tasks and activities – with some being 'demands' (tasks that had to be completed), and some preferred, motivational activities which served as a reward for completed curricular tasks.

**Planning:** For science lessons, the teacher and teaching assistant (TA) talked through the expectations and planned outcomes for the lesson, and how these would be communicated to the learner. Some visuals were consistent, though sometimes the teacher and TA agreed language and visuals for more specialised tasks (e.g., when the class went on a learning walk in the local area to observe the changing of the seasons). Tasks were developed in line with the learner's individual needs, and most were planned to take about five minutes to complete. When the NNT was first implemented, the 'next' task was a preferred activity; as the learner made progress towards his target and was consistently able to complete the five-minute task, the 'then' task on the NNT became the preferred activity, so that the learner was extending his attention to curriculum tasks, completing two five-minute tasks before the preferred activity.

**Implementation:** At transition, when the learner came in from morning play, the teacher greeted the learner and walked with him to the back of the classroom to quietly discuss the lesson 1:1 whilst the TA settled the rest of the class on the carpet. The language staff used was familiar to the learner, and consistent across all adults in the classroom: 'Now you are sorting the animals into groups, next you will draw the animals into your chart, then you can have five minutes free time to create your favourite animal with the Lego' – the teacher pointed to pictures on the NNT board whilst reviewing the parts of the lesson. The teacher would then prompt, 'What are you going to do now?'. Once the learner was set up with his task, the teacher would work with other learners, checking in with the learner regularly. As each task was finished, the learner enjoyed taking the picture off the board – it provided both a sense of achievement and motivation, as he knew he was moving closer to his desired activity. The teacher or TA would prompt the learner, 'You have finished sorting the animals, well done! Let's move the pictures – what is happening next?'

