

Supplementary guidance for the inspection of numeracy in schools

September 2021

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What is the purpose?

To provide guidance to inspectors for evaluating numeracy in schools

For whom is it intended?

Maintained and independent schools and non-maintained settings

From when should the guidance be used?

September 2021

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About this guidance

Copyright statement

The purpose of Estyn is to inspect quality and standards in education and training in Wales. Estyn is responsible for inspecting:

- nursery schools and settings that are maintained by, or receive funding from, local authorities
- primary schools
- secondary schools
- special schools
- pupil referral units
- all-age schools
- independent schools
- further education
- independent specialist colleges
- adult learning in the community
- local authority education services for children and young people
- teacher education and training
- Welsh for adults
- work-based learning
- learning in the justice sector

Estyn also:

- reports to Senedd Cymru and provides advice on quality and standards in education and training in Wales to the Welsh Government and others
- makes public good practice based on inspection evidence

Every possible care has been taken to ensure that the information in this document is accurate at the time of going to press. Any enquiries or comments regarding this document/publication should be addressed to:

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About this guidance

Our inspection guidance explains **What** we inspect and **How** we inspect. However, we also produce **supplementary guidance** to help inspectors to consider specific aspects of education and training further.

The supplementary guidance documents set out some key principles, considerations and resources for inspectors. They relate to all sectors that Estyn inspects, unless they state that they are for a specific sector. They expand on certain aspects of education/training (e.g. the inspection of literacy) or on ways of conducting inspections (e.g. the use of learning walks) or specific inspection arrangements (e.g. guidance on inspecting church schools).

The supplementary guidance documents do not aim to be comprehensive. Inspectors are not required to work through them exhaustively when covering any specific aspect on an inspection. However, inspectors may find them useful when responding to specific emerging questions that arise during inspections or when they wish to reflect or investigate further.

The supplementary guidance documents may help providers gain an understanding of Estyn's inspection arrangements. They may also be helpful to providers in evaluating specific aspects of their own provision.

Our inspection work is based on the following principles:

- Inspectors will approach inspection with a positive mind-set to ensure it is the best possible professional learning experience for the staff in each provider
- Inspectors will take a learner-focused approach to inspection
- Inspectors will always focus strongly on the quality of teaching and learning
- Inspectors will seek out well-considered innovative practice
- Inspectors will tailor the inspection activities according to the circumstances in each provider as far as possible
- Inspectors will be agile and responsive to emerging findings and will use the increased range of inspection tools and approaches available
- Inspectors will consider everything in the inspection framework, but will only report on the key strengths and weaknesses within each provider

Guidance

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Document A: Questions for listening to pupils

Inspecting numeracy

Inspecting numeracy

Numeracy is an essential skill that enables pupils to apply their numerical facts, skills and reasoning to solve problems. Although pupils usually learn these skills during mathematics sessions, to be fully numerate they must be able to apply these skills in other subject areas and a wide range of contexts.

The key tasks for inspectors are to judge:

- the standards of pupils' numeracy skills
- whether pupils have the numeracy skills needed to access the whole curriculum
- how well the whole curriculum develops pupils' numeracy skills
- the quality of leadership in, and management of the co-ordination of numeracy

Inspectors should report on pupils' numeracy skills in every inspection and, where appropriate, report on any outcomes or indicators that relate to these skills.

The following guidance is intended to support inspectors in making judgements and reporting on standards in numeracy and on pupils' ability to use these skills in work across the curriculum. Although the guidance contains information about the school's provision for numeracy, inspectors should remember that the main focus should be on the impact it has on pupils' standards

Gathering and reviewing inspection evidence

The team will plan the inspection so that they can cover the reporting requirements within the five inspection areas. They will ensure that they have enough time to review the key evidence they need to make their judgements. Inspectors will undertake a range of activities to gather evidence for their evaluation of pupils' progress and the quality of the school's provision. This may include:

- **samples of pupils' work**

The team will use direct observation of pupils' work wherever possible to gather evidence to support their judgements. Inspectors may select an additional sample of pupils' work, if required, to further their investigation in a specific aspect.

Points to consider:

- Do pupils use a range of appropriate **number and measuring skills**?
- Do pupils use an appropriate range of **data handling skills** (for example gather information in a variety of ways, record, interpret and present it in charts or diagrams, identify patterns in data and convey appropriate conclusions, select an appropriate graph to display the data, using an appropriate and accurate scale on each axis, and tell the 'story of a graph')?
- Do pupils **apply** these skills in different contexts effectively to solve real-life problem (points to consider are relevance, challenge, planning, processing and reasoning)?
- Are learning activities **purposeful** and do they build successfully on what pupils know?
- Is there clear evidence of appropriate **differentiation**?
- Does **feedback** help pupils to improve their work

- **observation of teaching and other activities, including evidence gathered through learning walks**
- **discussions with stakeholders**

1. discussions with pupils about their work.

This is a key source of evidence for inspectors. Discussions with pupils both in the classroom and in focus groups, will provide an opportunity to explore pupils' knowledge and understanding of their work. It will also help inspectors to gauge how well the school supports pupils and contributes to their progress and wellbeing. The questions in [Document A](#) could be used as a prompt when discussing numeracy with pupils.

2. discussions with individual teachers about pupils' learning in their classes and how they plan work to meet their needs,
3. discussions with leaders, managers, governors, parents and others

The team will need to consider stakeholders' views on the school and test out the validity of those views during the inspection. These will include survey responses from pupils, parents/carers, governors, teaching and support staff and information from the local authority/regional consortium

- **documentary evidence**, including information on pupils' performance and progress

Schools should make information available to the inspection team about the standards achieved by pupils, particularly the results of any initial screening tests and other assessments. This will help inspectors to judge pupils' progress, to come to a view about the standards pupils achieve compared to their starting-points and the way teachers use the information from assessment to influence their planning and their lessons

During the inspection

IA1 Learning

Inspectors will judge pupils' numeracy skills appropriate to their age and ability and the task, such as tackling problems in unfamiliar contexts and identifying which skills and concepts are relevant to the problem. They should judge whether pupils are over-reliant on support that prevent them from developing their independent number skills.

Inspectors should identify situations where pupils have difficulty with their numeracy skills which is a barrier to their learning across the curriculum. Inspectors will need to identify the possible causes for this. For example, lack of knowledge of number facts, multiplication tables, place value, estimation skills and routine checking methods.

Inspectors should consider how well pupils:

- use a range of appropriate number skills (for example four rules of number, place value, estimation and simple fractions and percentages and mental methods of calculation)?
- use a range of appropriate measuring skills (for example working with scales, units of measurements, time, and temperature)?
- use an appropriate range of data handling skills (for example gather information in a variety of ways, recording, interpreting and presenting it in charts or diagrams, identifying patterns in data and conveying appropriate conclusions, selecting an appropriate graph to display the data, using an appropriate and accurate scale on each axis, and being able to tell the 'story of a graph')?
- apply their skills accurately when working independently and with others
- evaluate their solutions
- draw on skills and concepts learned previously and apply it to their new learning
- apply their numeracy skills in different subjects and contexts and whether the skills are at the same level across the curriculum as they are in mathematics lessons

Sources of evidence include:

- samples of pupils' numeracy and mathematics work
- learning walks and session observations to judge how well pupils apply their numeracy skills across the curriculum.
- discussions with pupils about their work.
- analysis of standardised numeracy scores of particular groups and their progress over time
- the progress of pupils on numeracy intervention programmes

IA2 Wellbeing and attitudes to learning

When considering pupils' wellbeing and attitudes to learning, inspectors should consider:

- pupils' attitudes to their numeracy work. For example, how well they engage in numerical activities, whether they are able to sustain concentration when tackling problems and how well they persevere with more challenging tasks

IA3 Teaching and learning experiences

Estyn has no preferred methodology for teachers to follow. Teachers should structure the lesson in the way that they consider is most appropriate for the learners in the class and the learning objectives they wish the learners to achieve. The inspector should judge teaching in the context of learning over time and in relation to the success of the learning and the progress made by learners, not on the methods used or the type or style of delivery by the teacher.

Inspectors should consider how well the teaching:

- promotes high expectations of pupils with clear progression in and between lessons including high standards of accuracy and precision and the use of correct mathematical terminology
- provides opportunities for pupils to develop and apply their number, measure and data handling skills in mathematics and across the curriculum
- makes effective use of formative assessment to ensure that pupils are using numeracy skills at an appropriate level and that there is good pace and an increasing level of challenge in tasks.
- makes frequent links across the curriculum, so that concepts and skills are developed further by being applied in different, relevant contexts
- uses mathematical information to improve pupils' reasoning and problem-solving skills
- encourages pupils to talk about and explain their work, look for patterns, interpret and draw valid conclusions from their data
- uses probing questions to improve pupils' understanding and encourage pupils to explain their thinking and make learning connections
- anticipates and addresses pupils' misconceptions in a timely and effective manner, with errors providing productive points for discussion
- makes effective use of techniques to check for accuracy
- exploits the use of ICT to support the development of pupils' numerical and problem solving skills where relevant

Inspectors should consider:

- How well the school tracks and monitors pupils' progress in developing their numeracy skills as they move through the school, including pupils participating on intervention programmes
- How well staff adapt programmes of study when pupils are working significantly below or above expected levels of numeracy skills
- how well the school uses assessment data to identify pupils in need of additional support
- how effective the intervention programmes are to ensure that pupils make good progress
- how well information about pupils' skills and progress is shared between staff
- how staff adapt teaching and learning strategies for pupils receiving intervention and what is the quality of the training that teaching assistants deliver the intervention programme receive
- how well assessment is used to inform decisions about whether pupils remain in support programmes or no longer need intervention work
- how the school ensures that classroom teachers are aware of the teaching and learning strategies and the resources used in the intervention programmes?
- what strategies the school uses to ensure teachers confidently use similar strategies and resources in their lessons?

Inspectors should consider whether:

- there are clear whole-school policies to improve the teaching and learning of numeracy, and that the policies are implemented consistently
- information obtained from assessment is used to set clear targets for improvement in numeracy for individuals, groups of pupils and the whole-school
- teachers are clear about the learning objectives and progression in relation to the development of pupils' numeracy skills and are well-placed to share this information with pupils and parents
- pupils are involved in the assessment of their own work in numeracy and in identifying objectives for improvement.
- there is coherent provision for the use and application of pupils' skills in numeracy across the whole curriculum
- tasks set are matched appropriately to pupils' developing needs and abilities
- the school provides a good balance between structured activities for direct teaching of mathematical development and active approaches, such as in the foundation phase including play-based learning
- in the foundation phase there are appropriate opportunities for pupils to develop their number, measuring, spatial and data handling skills in areas of continuous and enhanced provision both indoors and outdoors

IA5 Leadership and management

Inspectors may hold discussions with leaders and managers to consider how well they initiate and support effective skills strategies and policies across the range of the school's work.

Inspectors may consider:

- whether leaders are well-informed about developments in the teaching and learning of numeracy, provide strong leadership and convey high expectations about pupils' achievements
- how well leaders focus on raising standards and if they know how well pupils are progressing, including those receiving support or extension
- how well leaders actively monitor and evaluate the quality of the numeracy provision throughout the school by considering its impact on pupils' progress
- whether the development of numeracy skills has an appropriate level of priority in the strategic and operational planning
- how well the numeracy co-ordinator helps other teachers with their planning and shares good practice
- whether professional learning successfully develops staff skills to improve provision for numeracy including the sharing of good practice
- how well co-ordinators for other subjects are alert to the opportunities that exist within those subjects for improving pupils' skills in numeracy
- how well parents are kept informed about the school's policy for improving standards in numeracy and are encouraged to be involved through discussions at school and the regular use of homework.

Document A: Questions for listening to pupils

Younger pupils in the foundation phase

- Can you play a game with me? Where would I be if I was (point): under the cupboard/on top of the chair/by the side of the whiteboard/inside the climbing frame? (positional language)
- Spread some objects out on a table: How many 'books' are there on the table? Pile/group them carefully: how many are there now? (Can they count/conserve number?)
- What do you do if you cannot work something out?

Older pupils in the foundation phase

- What type of numeracy/mathematics do you like best – working with numbers, measuring, finding out about shapes or working with data?
- What do you find easy about numeracy/mathematics?
- What do you find difficult about numeracy/mathematics?
- Do you know the pairs of numbers that go to together to make 10? What about 20 or 100?
- Tell me what happens when you halve or double a number?
- Do you sometimes plan how to solve a number problem? Do you sometimes plan with a friend or in a group?
- What do you do if you cannot work an answer out in mathematics?
- Do you sometimes do numeracy/mathematics work on the computer?
- Tell me how you worked this out.

Pupils in key stage 2

- What type of numeracy/mathematics do you like best – working with numbers, measuring, finding out about shapes or handling data?
- Do you use your numeracy/mathematics skills in others areas such as geography and science? If yes, can you think of an example?
- What do you find easy about mathematics?
- What do you find difficult about mathematics?
- Do you use the computer to create graphs, charts and diagrams?
- What do you do if you can't work out an answer?
- Do you know what happens to a number when you multiply or divide it by 10 or 100?
- What strategies do you use to help you work out your times tables?
- How do you check your answers?
- Tell me how you worked this out.
- Can you show me a piece of work where you used mathematics outside of a maths

lesson? Can you explain what you have done?

- Can you show me some work where you have solved a problem that involved numbers? Can you explain your thinking?

Pupils in key stage 3

- Are you making progress in improving your numerical skills? How do you know?
- What is your attitude towards numeracy? Do you think it's important to have good numeracy skills? Why?
- Do you know what you have to do to improve your numerical skills further?
Examples
- How often do you use your number work in other subjects?
- Can you think of examples where you have used mathematics such as number work, graphs, shape, etc. in subjects other than mathematics?
- How easy or difficult has this work been e.g. are you able to use a calculator when unsure?
- Do you think that subjects other than mathematics help you to reinforce and develop your number skills?
- Do teachers let you explore on your own or with your peers how you might want to use different methods for calculating solutions to your problem?
- If you get a calculation wrong, do you have the opportunity to discuss this with your teacher and or peers, and to correct/improve your work? Can you show me some examples?