



Scottish National  
Standardised Assessments

National report for  
academic year 2017 to 2018

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## Contents

Preface .....	5
1 Introduction .....	6
1.1 What is SNSA? .....	6
1.2 Key features of SNSA.....	7
1.3 Reporting SNSA results .....	9
1.3.1 Reporting on learner capacity.....	9
1.3.2 Reporting on question difficulty .....	12
1.4 The first year of SNSA .....	12
2 Numeracy.....	13
2.1 The scope of the numeracy assessment .....	13
2.1.1 Numeracy for P1, P4, P7 and S3.....	13
2.1.2 Alignment with Curriculum for Excellence .....	13
2.1.3 A note on contexts used in SNSA numeracy assessments.....	13
2.2 Coverage of Curriculum for Excellence: benchmarks and organisers .....	13
2.2.1 Number .....	14
2.2.2 Fractions, decimal fractions and percentages .....	15
2.2.3 Measurement, time and money .....	16
2.2.4 Information handling .....	18
2.3 National results for numeracy .....	19
2.3.1 Overall capacity.....	19
2.3.2 Gender .....	23
2.3.3 Scottish Index of Multiple Deprivation .....	24
2.3.4 Ethnic background .....	26
2.3.5 Free School Meal Registered .....	28
2.3.6 Additional Support Needs.....	30
2.3.7 Looked After Children at Home and Looked After Children Away from Home.....	32
2.3.8 English as an Additional Language.....	34
3 Reading/Literacy .....	37
3.1 The scope of the reading/literacy assessment .....	37
3.1.1 Reading and literacy for P1, P4, P7 and S3 .....	37
3.1.2 Alignment with Curriculum for Excellence .....	37
3.1.3 A note on texts used in SNSA reading assessments .....	37
3.2 Coverage of the Curriculum for Excellence: benchmarks and organisers .....	37

3.2.1	Tools for reading .....	38
3.2.2	Finding and using information .....	40
3.2.3	Understanding, analysing and evaluating .....	41
3.3	National results for reading .....	46
3.3.1	Overall capacity .....	46
3.3.2	Gender .....	49
3.3.3	Scottish Index of Multiple Deprivation .....	50
3.3.4	Ethnic background .....	52
3.3.5	Free School Meal Registered .....	54
3.3.6	Additional Support Needs .....	55
3.3.7	Looked After Children at Home and Looked After Children Away from Home .....	57
3.3.8	English as an Additional Language .....	59
4	Writing .....	62
4.1	The scope of the writing assessment .....	62
4.2	Coverage of the Curriculum for Excellence: benchmarks and organisers .....	62
4.2.1	Spelling .....	62
4.2.2	Grammar .....	63
4.2.3	Punctuation .....	65
4.3	National results for writing .....	67
4.3.1	Overall capacity .....	67
4.3.2	Gender .....	69
4.3.3	Scottish Index of Multiple Deprivation .....	71
4.3.4	Ethnic background .....	73
4.3.5	Free School Meal Registered .....	75
4.3.6	Additional Support Needs .....	77
4.3.7	Looked After Children at Home and Looked After Children Away from Home .....	79
4.3.8	English as an Additional Language .....	81
5	Forward look: national reporting for 2018 to 2019 academic year .....	84
6	Appendices .....	85
6.1	Appendix 1: Assessments completed during the 2017 to 2018 academic year .....	85
6.2	Appendix 2: Timing of assessments and factors influencing attainment .....	86
6.3	Appendix 3: Composition of the SNSA assessment instruments .....	87
6.4	Appendix 4: Quality assurance .....	89
6.4.1	Scottish Government and Education Scotland reviews .....	89
6.4.2	Small-scale trialling – Local authority trialling phase .....	90
6.5	Appendix 5: Statistical reliability of the SNSA for academic year 2017 to 2018 .....	91

6.6	Appendix 6: Region descriptions from the 2017 to 2018 individual reports.....	91
6.6.1	Numeracy region descriptions .....	92
6.6.2	Reading (including P1 literacy) region descriptions.....	96
6.6.3	Writing region descriptions.....	100
6.6.4	Interpretation of region descriptions .....	103

## Preface

This report has been developed to provide a summary of outcomes at a national level on the newly established system of national standardised assessments, which has since been termed 'Scottish National Standardised Assessments' (SNSA) in the 2017 to 2018 academic year, the first year of the programme.

The report provides information on two main areas:

- What SNSA sets out to measure, by way of a high-level description of each organiser included within the assessments. The descriptions are exemplified by a small number of questions from each of the organisers, with commentary on learner performance on this sample of questions. These questions were presented to learners during the 2017 to 2018 academic year; none of these items are used in SNSA 2018 to 2019, and they will not be used in future Scottish National Standardised Assessments.
- Findings at a national level, showing comparisons across the different organisers within the assessments, and focusing on selected learner characteristics including gender, Scottish Index of Multiple Deprivation (SIMD), ethnic background, free school meals, additional support needs, looked after children at home and away from home, and English as an additional language.

The information in this report is intended to supplement the information already available to schools and local authorities for the 2017 to 2018 academic year, for their own setting, and is intended to provide staff with details of the national picture. These staff may want to consider the information in this report to help determine any support or interventions that may be needed in the current or future school years, such as providing assistance to specific groups, or helping to identify areas of the curriculum that may benefit from an increased focus in learning and teaching.

This report is not intended to form the basis of an accountability measure against which performance will be tracked over time. The main aim of SNSA is to provide a diagnostic tool that can be used as part of a range of evidence to support teachers' professional judgement of children's and young people's progress in learning. The report is intended to support this aim through the dissemination of findings at a national level.

## 1 Introduction

### 1.1 What is SNSA?

In January 2016, the Scottish Government published [The National Improvement Framework for Scottish Education](#) (hereafter ‘the Framework’). The Framework set out the Scottish Government’s vision and priorities for Scotland’s children and young people. It was developed to support high-quality learning and teaching – the core principle of Curriculum for Excellence (CfE). Over time, it was intended that the Framework would provide a level of robust, consistent and transparent data across Scotland to extend the understanding of what works, and drive improvements across all parts of the system.

To meet the aims of supporting high-quality learning and teaching for Scottish children and young people, it was determined that gathering data on children’s progress at key points in their education, including data on differences between those from the least and most deprived areas, was essential. Improved data of this kind would support the planning of further interventions to ensure that all learners achieve as well as they can. Part of this information would be provided by the SNSA.

The assessments have been available for use in publicly funded schools in Scotland since August 2017. They are administered to children and young people in Primary 1, Primary 4, Primary 7 and Secondary 3 (P1, P4, P7 and S3) across Scotland, once in each school year at any point in time. Reports to schools and teachers are provided as soon as a learner completes an assessment. Additional reports are available for local authorities. This national report presents a description of what SNSA sets out to measure, and some findings from the first year of the programme.

Results from Scottish National Standardised Assessments provide one source of evidence as part of a range of evidence to support teachers’ professional judgement of children’s and young people’s progress in learning. ACER’s approach to learning assessments is that they should assist in:

- clarifying starting points for action
- investigating details of student learning and performance
- monitoring improvements and evaluating educational interventions
- motivating effort and encouraging self-monitoring
- providing feedback to guide future action.<sup>1</sup>

The user reports provided for the SNSA support a number of these points by providing teachers, school leaders and local authorities with diagnostic information about learners’ strengths and areas of challenge that can be used to plan next steps in learning. Alongside other assessment evidence, the information reported in SNSA can also be used to inform teachers’ professional judgement on achievement of CfE levels. A central aim of SNSA is also to provide information on the outcomes of Scottish children and young people in literacy and numeracy over time.

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<sup>1</sup> Masters, G.N. (2013). *Reforming Educational Assessment: Imperatives, principles and challenges*. Australian Education Review 57. Melbourne: Australian Council for Educational Research.

## 1.2 Key features of SNSA

The SNSA programme has a range of important and innovative features:

- it is delivered online

Children and young people present for the assessments using a digital device: a desktop computer, laptop or tablet. The assessments are delivered online, and because all items (questions) are automatically scored, teachers can access their learners' reports as soon as an assessment is completed.

SNSA are designed to be administered on a range of devices, including desktop PCs, laptops and tablets, and delivery on the most commonly available browsers is supported. This flexibility in mode of delivery is designed to support administration of SNSA across a range of different classroom settings and enables schools to choose the method of presentation that best suits them. An online tool to assess technical readiness is available. This tool can be applied in advance of the device being used for the assessments, to ensure that the assessments function as expected. With this flexibility of delivery, the content of the assessments, within the adaptive design model, remains consistent.

- it is adaptive

The questions presented to children and young people vary according to how well they are performing on the questions they have answered so far. All learners begin an assessment with a set of questions of middle-level difficulty. If a learner does well on these, the next set of questions presented will be more challenging. If a learner is not succeeding on early questions, the items become easier – and so on, through the assessment. The adaptive nature of SNSA means that the experience for each learner is modified so that the assessment is neither too hard nor too easy but appropriate for their level of capacity. The adaptive design also means that the diagnostic value of the assessment is optimised. An assessment is most useful as a formative tool when there are no 'floor' or 'ceiling' effects. A 'floor effect' occurs when an assessment is too hard, so it tells only what a learner cannot do. If this happens, it is impossible to see a starting point on which future learning can build. A 'ceiling effect' occurs if an assessment is too easy and a learner gets every question right. When this happens, it is impossible to judge the upper reach of their attainment and thus to help this learner to go the next step. The adaptive design, when working well, enhances the learner's experience of the assessment and serves optimally in establishing where children and young people are in their learning development.

- it has a carefully judged number of questions per assessment

Each assessment has from 30 to 36 scored items, with the number of questions increasing from Primary 1 to Secondary 3. These numbers of questions allow coverage of different aspects of each of the assessed subject areas, without excessive time being required by any learner. On average, in the 2017 to 2018 academic year, children and young people completed each of the assessments within 30 to 40 minutes (less than 30 minutes for Primary 1 children). However, there is no time limit for completing SNSA, and where a teacher judges it necessary, a child or young person may take a break and come back to pick up the assessment where he or she left off.

Each question in the assessments has been empirically tested to make sure it 'works'. Before being included in SNSA, every question has been presented to several hundred

learners of a similar age and stage to the ultimate respondents, to ensure that it has sound measurement characteristics and will yield statistically consistent results. In addition, every question has been reviewed and signed off by a panel of experts from within Education Scotland.

- responses are objectively scored

The majority of questions in SNSA are in ‘selected response’ format, mostly multiple choice. The advantages of this format are both educational and technical. First and foremost, an advantage of this format is that all responses are marked consistently, so there is no question about the reliability and standardisation of the results at the question level. A second advantage, in terms of curriculum, is that because learners can complete questions relatively quickly, a wider range of curriculum content can be covered in a limited time than would be possible if children have to generate their responses. A third advantage is that the assessments can be instantly marked, allowing the allocation of assessment items of an appropriate difficulty level within the adaptive design. Additionally, reports can be accessed as soon as an assessment is completed, so teachers can use the formative feedback immediately. There is, of course, much to be learnt about children’s understanding and skills from other modes of assessment, from short written responses to essays or projects and performances. However, assessments using selected response formats serve the purposes of SNSA well in its role as one element in the wider array of assessments that teachers will use to evaluate children’s and young people’s learning.

The exception for the academic year 2017 to 2018, from the typical multiple-choice assessment format, was the relatively small number of items assessing spelling that required a constructed response in the writing assessments for P4, P7 and S3. These items included a text input box, where learners typed their spelling of a specific word. This item type allowed a quick response from learners and was automatically marked, so carried the same benefits as the closed-response items.

Other features of the SNSA programme are specific to the Scottish education context.

- it covers agreed elements of Curriculum for Excellence

The assessments have been constructed to align with CfE. A design for each assessment covering organisers and learning statements defined in the *Benchmarks: Literacy and English* and *Benchmarks: Numeracy and Mathematics* (Drafts, August 2016) was agreed with Scottish Government and Education Scotland before the assessments were built. It should be noted that for the academic year 2018 to 2019, the final version of the *Benchmarks* (published in June 2017) is used as the reference point for the assessments. The content areas covered are described in more detail in the sections of this report dedicated to numeracy, reading and writing.

- it has a flexible delivery model

The flexible delivery model is intended to allow children and young people to be assessed at any time in the school year that is judged suitable for the school, class and individual learner. A consequence of the flexible timing is that, when interpreting the results of the assessment at individual, class, school, local authority or national level, the point in the school year that the assessment was taken needs to be taken into account.

There is clear evidence from the norming studies conducted during the academic year 2017 to 2018, in November and March, and from the whole year's attainment levels per stage, that children's and young people's capacities – their literacy and numeracy skills, knowledge and understanding – develop progressively, on average, over the 10 (effective) months of an academic year. Amongst the year groups presenting for SNSA, children in Primary 1 showed a marked increase in capacity in both literacy and numeracy: this can be seen when comparing results from 2017 (August to December) with those from 2018 (January onwards). The same pattern was observed for P4, P7 and S3, across all subject areas, but with diminishing increases in performance in 2018 for each successive year group. Within each year group, the rate of improvement between the first half and second half of the 2017 to 2018 academic year was similar, regardless of subject area. The only exception to this general pattern of improvement from 2017 to 2018 was for Secondary 3 reading, where the overall result was the same.

While the findings described above might be as expected, they also constitute a positive result, confirmed empirically with SNSA data. However, given the possibility of administering SNSA throughout the school year, results from all learners should be interpreted with some caution when making any comparative judgements about individuals or groups. Each learner presented only once, and, because the timing of the SNSA was locally determined (except for the norming studies), it cannot be assumed that the profile of children and young people who presented in the first half of the school year was the same as that of those who presented in the second half. For example, it is possible that teachers chose which learners should sit the assessment based on their judgement of their learning progress.

- it is designed to be accessible to all learners

The system is designed to be compatible with a range of assistive devices, so that learners can use the devices that they are familiar with from their everyday use in the classroom to support them in completing the assessments, including software and devices such as text readers, screen readers and switches. In the case of screen readers, the assessments have been developed to include alternative text descriptions of images, charts and graphs that are integral to answering a question. Detailed guidance is available for teachers in relation to additional support needs (ASN) and English as an additional language (EAL). The information gathered from across the school year on which the analysis within this national report is based includes data from learners with ASN and EAL.

### 1.3 Reporting SNSA results

In the academic year 2017 to 2018, the terms 'high', 'medium' and 'low' were used in reporting the results of SNSA to schools and local authorities, and they are also used in this report.

#### 1.3.1 Reporting on learner capacity

The reports available to schools and local authorities for SNSA 2017 to 2018 provided diagnostic information about each question presented to an individual or group of children or young people. This diagnostic information showed, for each question, which organiser the question belonged to, the skills, knowledge and understanding assessed and the question's difficulty, as well as the individual's or group's results on the question. This

diagnostic information provides one piece of evidence to help the education profession identify areas of strength or challenge at the individual learner level or for groups.

Another key feature of the reports for schools and local authorities in the first year of SNSA, the 2017 to 2018 academic year, was information about learners' overall results. Each year group's capacity was reported in three broad regions: high, medium and low. The capacity of learners who achieved only a small degree of success on the assessment was labelled low. Similarly, the capacity of learners who achieved a substantial degree of success on the assessment was labelled as high. These broad overall capacity regions were related to regions of learner capacity on the assessment that were specific for each subject area and year group, and each capacity region for each of the eleven SNSA had a corresponding description unique to that assessment. These descriptions were based on a summary of the skills, knowledge and understanding assessed in the questions included in this first assessment in the academic year 2017 to 2018, which, in turn, were aligned with *Benchmarks*. The region descriptions for each assessment and stage are shown in Appendix 6: Region descriptions from the 2017 to 2018 individual reports.

The location of a learner's capacity indicated that he or she was twice as likely as not to succeed on the questions in the assessment addressing the skills, knowledge and understanding in the description for that region. The position locating the learner's capacity against these descriptions, on their individual reports, showed the kinds of skills, knowledge and understanding he or she demonstrated in the particular assessment.

The terms high, medium and low have a specific and different meaning for each of the assessments, according to subject area and year group. Accordingly, the dot on an individual's report, locating the learner's capacity, shows what kinds of skills, knowledge and understanding he or she demonstrated in the particular assessment, rather than any fixed judgement about the learner's aptitude.

It is important to note that, because each of the capacity regions for 2017 to 2018 is specific to a P1, P4, P7 or S3 assessment, regions are not comparable across year groups. Therefore, differences in results across year groups do not reflect growth in capacity. For the 2018 to 2019 academic year, the newly established bands corresponding to the SNSA long scale will allow comparisons across year groups in terms of proportions of learners with capacity at each band.

In reporting for the 2017 to 2018 academic year, a large proportion of children and young people showed capacity in the region labelled high. In subsequent school years, results will be described with reference to a series of bands along the SNSA long scale for each subject – six overlapping bands per year group. During the course of the 2018 to 2019 school year, the 2017 to 2018 results will be transposed onto the long scale and made available to schools and local authorities.

The terms high, medium and low, in relation to learner capacity, are used with the meaning described here throughout this report.

The results on the assessment of an individual, a class or a school are intended as one piece of evidence – a fair and objective piece of evidence – in an evaluation of learners' capacities. The holistic result on the assessment is intended to be used by teachers to corroborate or, sometimes, to raise questions about, other reference points in their overall assessment of a learner's capacity.

Figure 1 shows an example extract from an individual report (for a fictitious learner) for the Primary 7 Reading assessment for 2017 to 2018. To the left is a scale labelled high, medium and low, accompanied by the region description text, referred to above, for each of the broad regions. The easiest content is summarised in the paragraph at the bottom, and the most difficult summarised in the paragraph at the top.

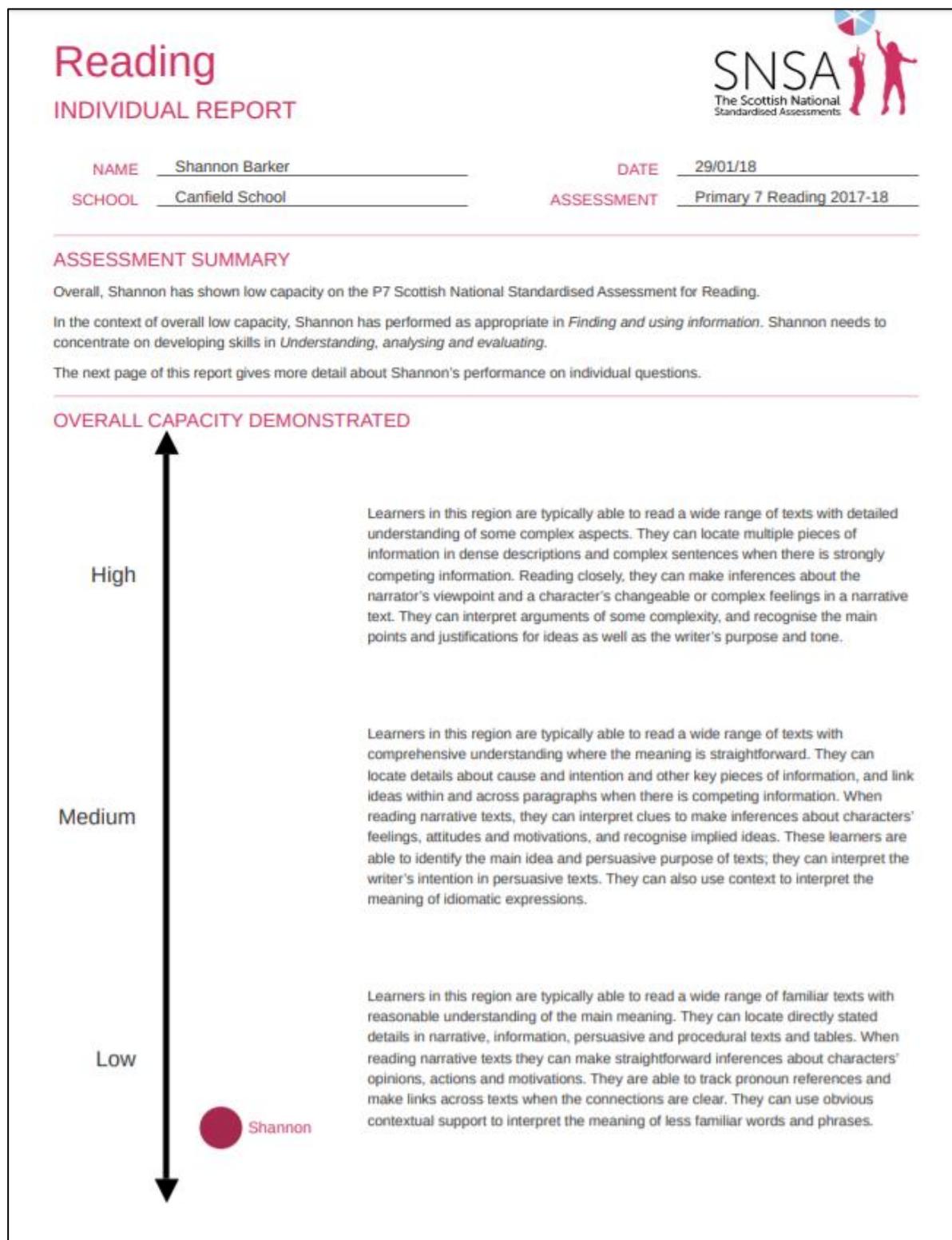


Figure 1: Example page from an Individual Report

### 1.3.2 Reporting on question difficulty

Just as each learner's overall capacity was expressed as high, medium or low, each question in the assessment was also categorised as being of high, medium or low difficulty. A question categorised as having low difficulty in SNSA was one that learners of this age and stage generally tended to be more likely to answer correctly. A question categorised as medium in difficulty was one that fewer learners were able to answer correctly. A question categorised as high was one that relatively few of the learners were able to answer correctly. The ratings of question difficulty appeared next to a brief description of each question on reports to schools to assist teachers diagnostically in interpreting the challenge of the questions presented to the individual child or young person.

More detail about the content of the assessments is provided in the subject area sections of this report.

## 1.4 The first year of SNSA

The 2017 to 2018 academic year was the first year of implementation for SNSA, and 579,879 assessments were completed across Scotland over the course of the year. This number is equivalent to about 95% of the possible maximum number of assessments available for children and young people in P1, P4, P7 and S3.

It should be noted that two circumstances which applied to the implementation of SNSA in 2017 to 2018 have shaped the scope of this report. Firstly, while a primary aim of the programme is to provide information on progress in learning, it is not yet possible to report on progress insofar as it entails a comparison. This year's outcomes will serve as a baseline in judging progress, from 2017 to 2018 onwards, at school and larger group levels, and will eventually provide teachers with information on the progress of individuals as they move from Primary 1 through the years of schooling.

Secondly, the metric on which SNSA was reported in the 2017 to 2018 academic year was not standardised for the Scottish population. A broad categorisation of attainment as high, medium or low was used in this first year, based on data from international contexts.<sup>2</sup> A more refined scale for each subject area has now been developed, drawing on the results from two representative samples of Scottish children and young people presenting for SNSA, assessed in the first and second halves of the 2017 to 2018 academic year; as well as data from an equating study in the year groups P2, P3, P5, P6, S1 and S2, the year groups in between those that form part of SNSA (P1, P4, P7 and S3). These new 'SNSA long scales' are being used for reporting from August 2018 onwards.

The Scottish Government's policy and practice of continuous improvement applies not only to educational attainment but also to the SNSA programme itself. Enhancements to content, reporting, the system delivering the assessments and the professional training courses accompanying the assessments were introduced during the 2017 to 2018 academic year, and further improvements will be implemented over the coming years.

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<sup>2</sup> Please refer to Appendix 4: Quality assurance, for details of quality assurance processes completed within Scotland prior to the launch of SNSA.

## 2 Numeracy

### 2.1 The scope of the numeracy assessment

#### 2.1.1 Numeracy for P1, P4, P7 and S3

There were separate assessments of numeracy for P1, P4, P7 and S3. The same set of organisers was used for each of the assessments, with the proportion of items in each organiser varying by stage to reflect the change in emphasis on each area within Curriculum for Excellence (CfE).

#### 2.1.2 Alignment with Curriculum for Excellence

In the academic year 2017 to 2018, the assessments of numeracy were based on elements of CfE as articulated in the *Benchmarks: Numeracy and Mathematics*, published as a draft in August 2016. It should be noted that for the academic year 2018 to 2019, the final version of the *Benchmarks* (published in June 2017) is used as the reference point for the assessments.

#### 2.1.3 A note on contexts used in SNSA numeracy assessments

For SNSA numeracy, a wide variety of simple contexts was used across the assessments. Questions typically comprised short, discrete questions, so contexts were relatively straightforward in nature, covering a mix of everyday life and the school environment. In a small number of instances, two questions in an assessment referred to the same charts or graphs.

All questions were reviewed by Education Scotland for their appropriateness to the Scottish context, prior to inclusion in the assessments.

### 2.2 Coverage of Curriculum for Excellence: benchmarks and organisers

SNSA is just one part of the range of assessments that teachers use in making their evaluations of children's and young people's learning. It has been possible to assess most areas of the numeracy benchmarks within this standardised assessment, using questions capable of being scored automatically. It is important to note that, although it is possible to assess all areas of the numeracy benchmarks through the assessment, the number of questions available does not allow for all areas to be covered within a single year, so the coverage will vary each year. Through consultation with Scottish numeracy experts, it was agreed that the numeracy assessments should be based on the following organisers: Number; Fractions, decimal fractions and percentages; Measurement, time and money; and Information handling. Each of the questions selected for inclusion in SNSA numeracy assessments for the academic year 2017 to 2018 is aligned with numeracy elements of the *Benchmarks: Numeracy and Mathematics*.

All four organisers were represented in the P1, P4, P7 and S3 numeracy assessments, with different proportions across the year groups. In the reports provided to schools, teachers received information about the capacity of the learner at the organiser level, if the learner was presented with at least five questions from that organiser. Similarly, in this report, results for organisers that were addressed by at least five questions in the year group's full set are analysed. In the case of numeracy, all four organisers are reported on here for each of the assessments.

### 2.2.1 Number

The main focus of this organiser is understanding the properties of numbers, and the ability to use the four basic number operations. It included questions that asked about estimating and rounding; number and number processes; addition, subtraction, multiplication and division; and place value. In P7 and S3, negative numbers were also assessed. This organiser could be regarded as containing some of the basic building blocks of numeracy: the ability to engage with content in the other organisers is dependent to some extent upon the ability to understand place value and properties of number, as well as being able to understand and use the four basic operations of addition, subtraction, multiplication and division.

Figure 2 shows a typical question reflecting the Number organiser for the P1 numeracy assessment. Note that the ‘mouth’ icon indicates to the learner that there is a voiced component to the question.<sup>3</sup> In this case, by clicking on the icon the child heard the full onscreen question text contained in the dialogue balloon. Please note that the question included in Figure 2 and all subsequent figures throughout this report are not included in any of the current assessments for the 2018 to 2019 academic year, and they will not be included in any future SNSA.

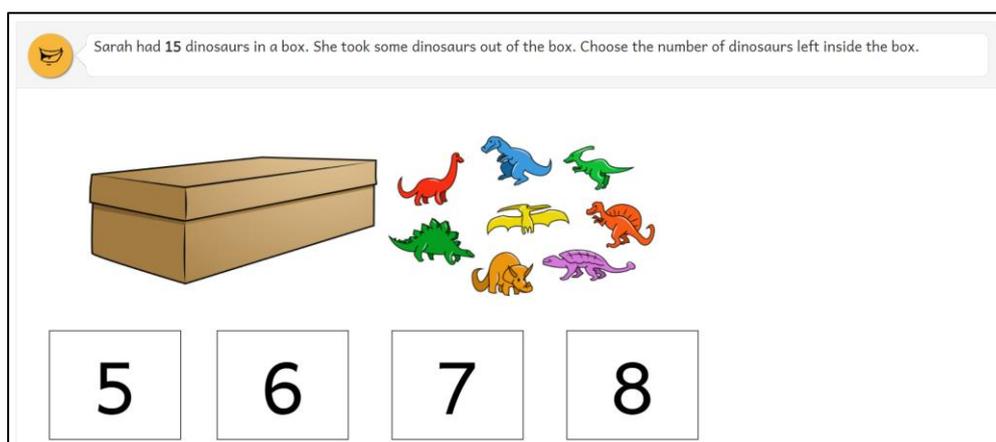


Figure 2: Example of a P1 Number question: assessing ability to solve missing number problems

This question is designed to assess children’s ability to solve word problems with missing numbers. As is common in number problems for this age group, the question is scaffolded with the inclusion of an image with countable objects. This enables children to use a counting strategy to solve the problem.

Figure 3 shows a high difficulty Number question from the S3 numeracy assessment for the academic year 2017 to 2018. It builds on young people’s existing knowledge of place value in whole numbers to assess their understanding of place value in decimal numbers.

<sup>3</sup> P1 children were shown how to use the ‘mouth’ icon in practice assessments. It is used throughout the literacy and numeracy assessments for this stage.

Which one of these numbers is "five thousandths"?

5 000

0.5000

0.005

0.0005

Figure 3: Example of an S3 Number question: assessing understanding of place value in decimal fractions

In this question, young people were asked to choose the correct numerical representation of a decimal number presented in word form. The answer options have been carefully selected to represent some of the most common misconceptions in relation to place value in decimal numbers. For example, the second answer option is based on the misunderstanding that digits to the right of the decimal point behave identically to the whole numbers to the left of the decimal point, so this number will be regarded by some young people as zero point five thousand. The first and second options were the most common answers among the learners showing lower capacity over the whole assessment, with the third option (the correct answer) and fourth option being more commonly chosen by learners showing higher capacity overall.

### 2.2.2 Fractions, decimal fractions and percentages

The main focus of this organiser is on the ability to recognise and work with fractions, decimal fractions and percentages. At P1, this involves sharing objects into equal sets and recognising representations of halves. By P4, children were asked to recognise standard fraction notation for common fractions, order fractions by size, and recognise pictorial representations of fractions. In the P7 assessment, children were also assessed on their capacity to work with decimal fractions and percentages, recognise equivalent values in the different forms, and find fractions and percentages of a quantity. At S3, young people were also assessed on their capacity to work with ratios.

In the assessments for the higher year groups, there was an increase in the number of questions assessing this organiser. This shift in the assessments' weightings reflects learners' increasing familiarity with integers and the transition to applying their understanding of how to calculate with integers to their growing understanding of fractions, decimal fractions and percentages.

Figure 4 shows a high difficulty Fractions, decimal fractions and percentages question focusing on percentages from the P7 numeracy assessment for academic year 2017 to 2018.

White vinegar contains 5% acid.  
How many millilitres of acid are there in 150 ml of white vinegar?

0.3 ml

5.5 ml

7.5 ml

30 ml

Figure 4: Example of a P7 Fractions, decimal fractions and percentages question: assessing ability to find a percentage of a quantity

This question asks children to calculate a given percentage of an amount. The use of 5% as the percentage in the question prompt enables children to use a variety of approaches to solving the problem. The most likely strategy would be the standard approach of dividing by 100 and then multiplying by five; alternatively, children may make use of known facts to divide by 10 and then halve. The use of vinegar as a context enables children to demonstrate that they are able to apply their knowledge to situations where they may not have previously worked with percentages.

Figure 5 shows a medium difficulty Fractions, decimal fractions and percentages question from the S3 numeracy assessment for academic year 2017 to 2018.

At a football match, 35% of the crowd were children.  
What fraction of the crowd were children?

$\frac{3}{5}$

$\frac{7}{20}$

$\frac{7}{25}$

$\frac{5}{70}$

Figure 5: Example of an S3 Fractions, decimal fractions and percentages question: assessing conversion of a percentage into an equivalent fraction

This question is set in a simple context and asks young people to find a fraction that is equivalent to 35%. Since none of the denominators for the answer options are 100, young people demonstrated their understanding of simplifying fractions when successfully answering the question. In this case, they had to recognise that for 35/100, both the numerator and denominator are divisible by five.

### 2.2.3 Measurement, time and money

This organiser draws together the numeracy benchmarks that cover measurement, time and money. The measurement strand of SNSA progresses from comparing and ordering, and the use of non-standard units of measure at P1, to the use of standard units, reading scales and estimation, and calculating areas by counting squares at P4. By S3, young people were asked to demonstrate that they could calculate areas and volumes and convert between standard

units of measure. Money at P1 and P4 was about recognition of coin values and calculating change. At P7 and S3, budgeting, calculating profit and loss, and currency conversion also featured. Time covered areas such as reading clock times, interpreting timetables, calculating time durations and speed/distance/time calculations.

Figure 6 shows a medium difficulty question from the P4 numeracy assessment for academic year 2017 to 2018, reflecting the measurement aspect of the organiser.



Which unit would be best to measure the weight of a tiger?

kilogram (kg)

kilometre (km)

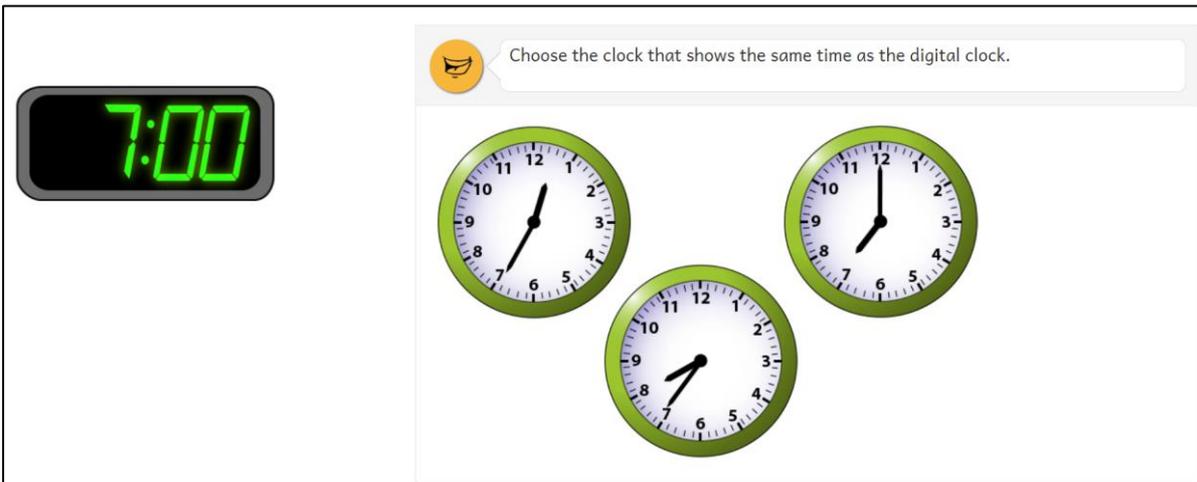
metre (m)

gram (g)

Figure 6: Example of a P4 Measurement, time and money question: using standard units of measure

The focus of this question is on identifying an appropriate unit of weight. This might be regarded as a less familiar style of question, since the majority of measurement questions focus on calculating values. Nevertheless, being able to recognise units of mass and then choose the most appropriate unit for a context is an important skill. The correct answer was the most commonly chosen answer among children, whether the overall capacity they demonstrated was high, medium or low. However, a reasonably high proportion of children showing lower capacity overall chose units of length rather than mass, suggesting a limited understanding of standard units of measure.

Figure 7 shows a typical P1 numeracy question, reflecting the time aspect of the organiser.



Choose the clock that shows the same time as the digital clock.

7:00

12 1 2 3 4 5 6 7 8 9 10 11

12 1 2 3 4 5 6 7 8 9 10 11

12 1 2 3 4 5 6 7 8 9 10 11

Figure 7: Example of a P1 Measurement, time and money question: assessing ability to read digital and analogue clock times

This question is designed to assess children's ability to recognise and read o'clock times in both digital and analogue formats. In this instance, children were asked to select the analogue clock which shows the same time as the digital clock. Typically, in SNSA and other assessments for this age group, differences in understanding between children with

different levels of capacity are less pronounced for questions involving analogue clocks than for many other curriculum areas. This may be due to experiences outside of school that affect children's understanding of this aspect more than in other areas of numeracy.

Figure 8 shows a medium difficulty question from the P1 numeracy assessment for academic year 2017 to 2018, reflecting the money aspect of the organiser.

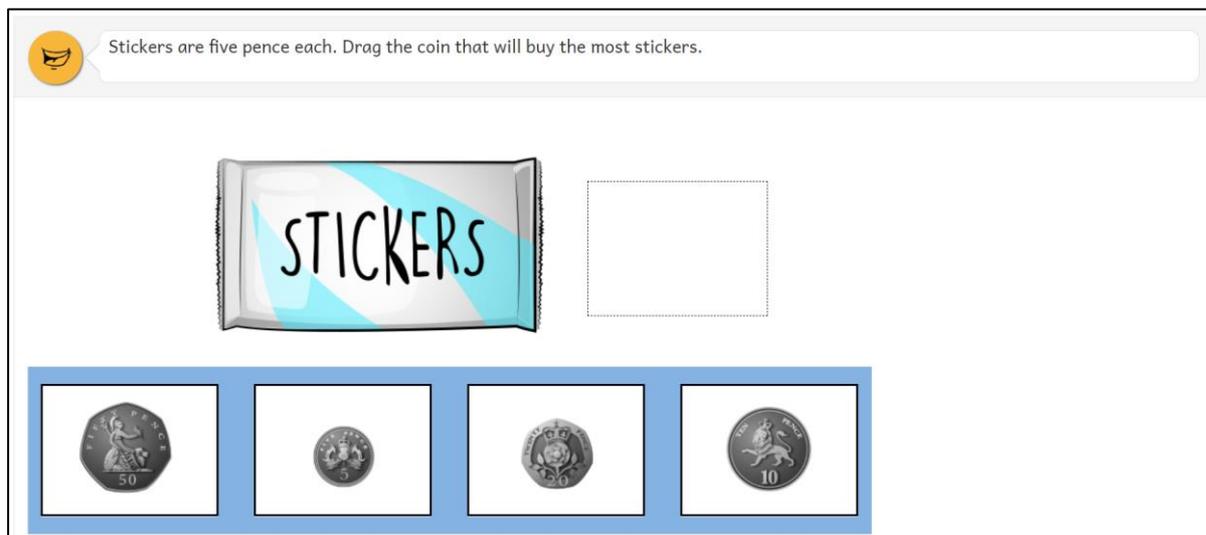


Figure 8: Example of a P1 Measurement, time and money question: assessing understanding of coin values

This question is designed to assess recognition of coin values and it also assesses the ability to compare and order values. Retaining and processing both pieces of information in a two-step problem adds an additional level of challenge.

#### 2.2.4 Information handling

The main focus of this organiser is on data and analysis. It involves the use and interpretation of a wide range of increasingly complex tables, charts and graphs. At P1, this begins with sorting and categorising objects according to specified criteria. Forms of data presentation that are assessed include Venn and Carroll diagrams, tally charts, tables, block graphs, bar graphs, line graphs and pie charts. Scales on the charts progress in complexity from those numbered in ones to having scales where not all values are marked. From P4 onwards, elements of probability, as detailed in the 'chance and uncertainty' benchmarks, are also assessed. This includes the language of chance and also the use of the 0 to 1 probability scale.

Figure 9 shows a medium difficulty question from the P4 numeracy assessment for academic year 2017 to 2018, reflecting the data and analysis aspect of the organiser.

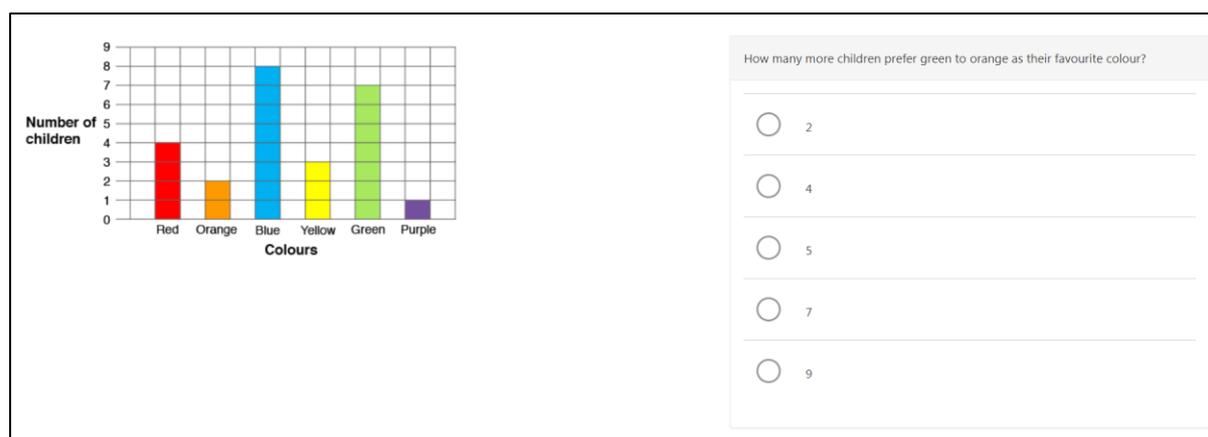


Figure 9: Example of a P4 Information handling question: comparing values on a block graph

This question shows a simple column graph where the scale is numbered in ones. For this year group, data from multiple SNSA questions demonstrate that the ability to successfully make comparisons is challenging. Among lower-capacity learners, the fourth option (7), which represents the number of children who chose green, was by far the most common answer, with the third option (5, the correct answer) typically selected only by learners who showed high capacity overall. Although the presentation of the data is relatively straightforward, this suggests that the need to both read values from the graph and then make a comparison added a significant level of challenge.

## 2.3 National results for numeracy

### 2.3.1 Overall capacity

Chart 1 shows, for each year group (P1, P4, P7 and S3), the overall capacity of all learners for numeracy as well as the capacity of all learners when only considering assessment content related to each of the four organisers: Number (NUM); Fractions, decimal fractions and percentages (FDP); Measurement, time and money (MTM); and Information handling (IH). Regions show high, medium and low capacity which are specific to each year group, in line with SNSA reports for the academic year 2017 to 2018.

Chart 1: Numeracy capacity by SNSA year



The chart shows that P1 and P7 learners are distributed across the three capacity regions such that their largest proportion is in the high capacity category, followed by the second-largest proportion in the medium capacity. For P4 and S3, the largest proportion of learners

is in the medium overall capacity category, followed by those who demonstrate high capacity.

At P1, the majority of children showed high capacity overall, with most of the others showing medium capacity. Only very few children showed low capacity. The majority of children in P1 showed high capacity with regard to all organisers. Across the four organisers, few children were found in the low capacity groups.

Overall, at P4, a majority of the learners demonstrated medium capacity, while a lower proportion showed high capacity and a minority showed low capacity. The Information handling organiser had the majority of learners in the high capacity group, while the Fractions, decimal fractions and percentages organiser had the majority of children in the medium capacity group. The Measurement, time and money and Number organisers had a similar distribution across medium and high capacity groups, with slightly larger proportions of learners in the medium capacity group. There was little difference when comparing levels of low capacity for each of the organisers, with only small proportions of children demonstrating low capacity in any of the organisers.

Overall, the majority of learners at P7 demonstrated high capacity on their numeracy assessment, while only relatively small proportions demonstrated low capacity. A majority of children in P7 showed high capacity with regard to each individual organiser. Across the four individual organisers, very few children were found in the low capacity groups.

At S3, the majority of learners demonstrated medium capacity for Measurement, time and money; Number; and Information handling, while for the Fractions, decimal fractions and percentages organiser, the majority of learners demonstrated high capacity. For each individual organiser, a small proportion of learners at S3 were in the low capacity region.

Evidence from educational research suggests that learning growth differs according to the stage of schooling. Bearing in mind that individuals experience growth spurts and plateaus in different ways, younger learners tend on average to advance in their learning more rapidly than older learners, for whom progress typically continues, but at a slower pace. The two SNSA norming studies<sup>4</sup> carried out in Scotland during the academic year 2017 to 2018, in the first and second halves of the academic year, allowed us to confirm that these findings also hold for numeracy acquisition among Scottish learners.

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<sup>4</sup> Results from the norming studies were used for the purpose of providing representative sample survey data, collected at clearly defined assessment periods during the school year.

Chart 2: Numeracy capacity across norming study time periods

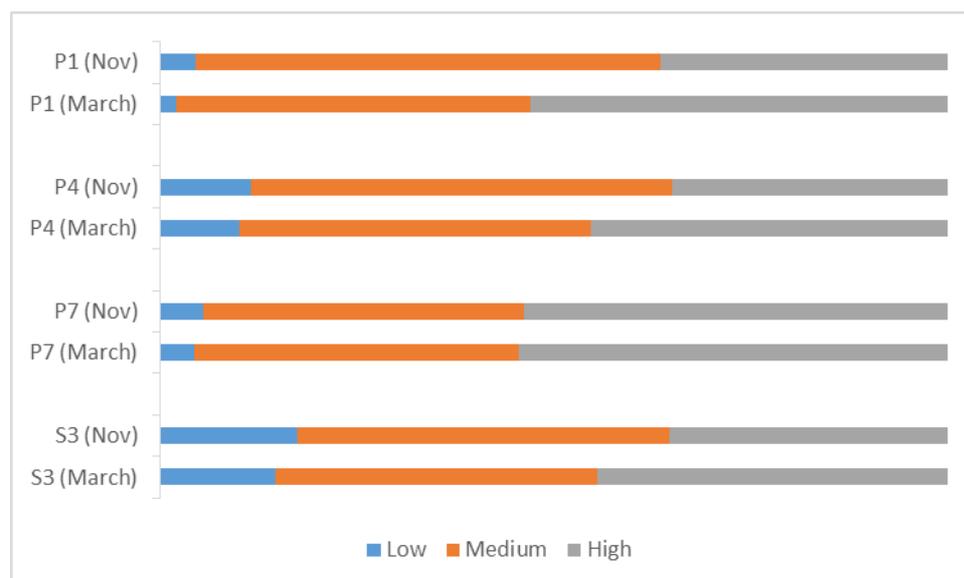


Chart 2 shows that between November and March, learning progress with regard to numeracy development was most prominent among learners at P1. In November 2018, less than half showed high capacity, while in March 2018, a majority was recorded with capacity in this region. At P4, in March 2018 compared with November 2017, there were relatively smaller but still noticeable increases in the proportion of learners at high capacity in this learning area. Learning progress at P7 was less marked than in the other year groups, with similar proportions of learners in each of the capacity regions in November and March. At S3, there was again a noticeable increase in the proportion of learners with high capacity between the two norming studies.

### 2.3.2 Gender

Chart 3: Numeracy capacity distribution by gender and SNSA year

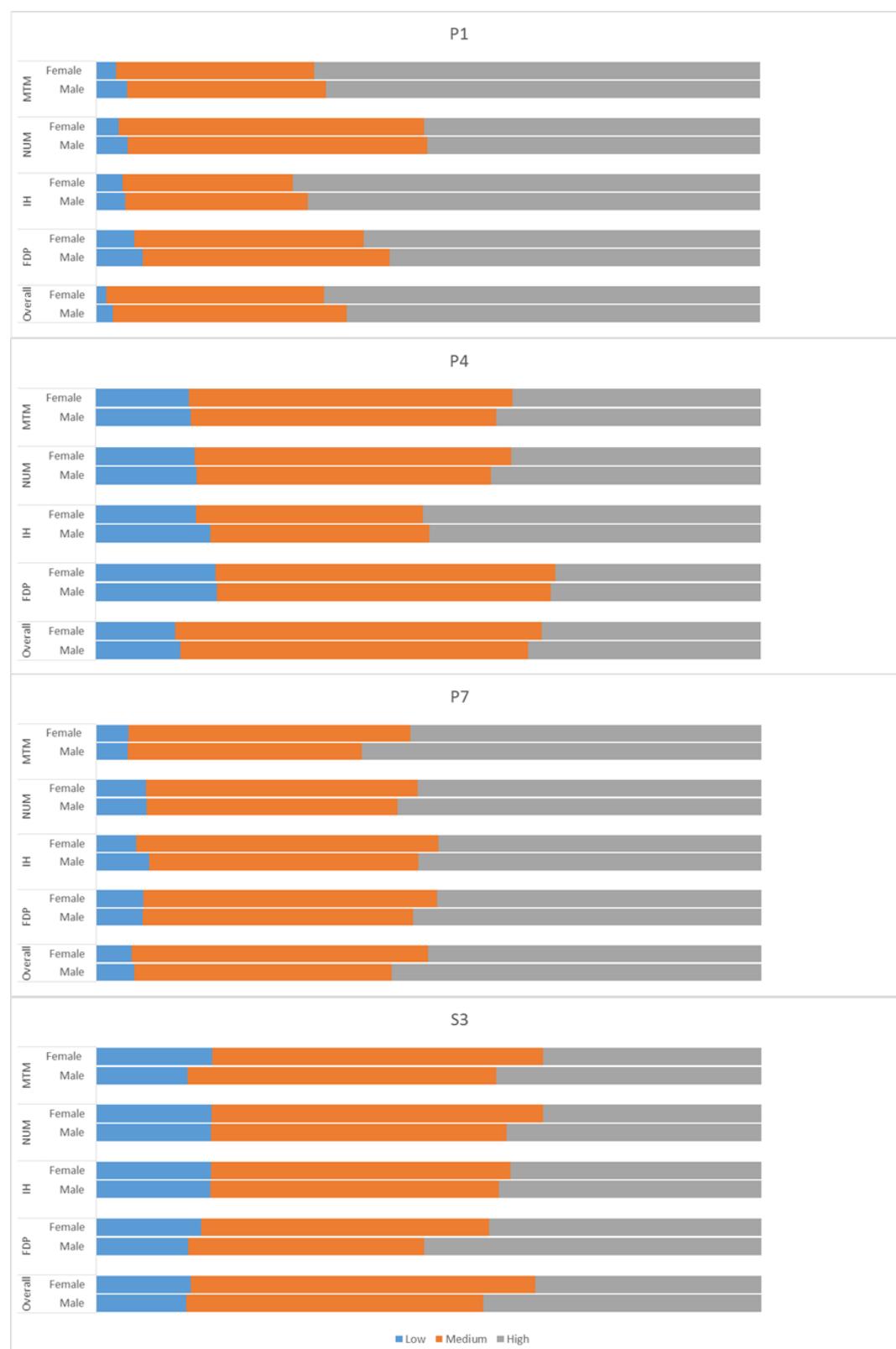


Chart 3 shows the proportions of numeracy capacity among boys and girls for all SNSA year groups, overall and when considering each of the four organisers. For P1 and P7, overall, the majority of boys and girls were in the high capacity region, while for P4, the majority of boys

and girls were in the medium capacity region. In S3, the majority of girls was in the medium category overall, with slightly less than half of boys reaching the same level. There were some notable differences between the two gender groups, with more girls in the high capacity region at P1, and more boys in the high capacity region at P4, P7 and S3. Small proportions of girls and boys were in the low capacity region across all SNSA year groups.

At P1, girls showed slightly higher levels of capacity in each individual organiser and overall. While the difference between the results for boys and girls was small across all organisers, it was slightly more noticeable when considering only assessment content related to the organiser Fractions, decimal fractions and percentages. Both boys and girls mostly gained results in the high and medium capacity regions across all organisers, with very few learners recorded within the low capacity region.

At P4, slightly more boys than girls showed a high overall capacity, while a higher proportion of girls demonstrated an overall capacity in the medium region. These results were also observed when considering the four organisers individually. Whilst the difference between boys' and girls' capacity was small for all organisers, it was slightly more noticeable when considering only assessment content related to the organiser Number.

At P7, a larger proportion of boys demonstrated high capacity overall when compared with girls, and the differences were somewhat larger than among learners at P4. This finding holds for overall and when considering the four organisers separately. The largest difference in capacity between boys and girls within organisers was observed for the organiser Measurement, time and money, in favour of boys.

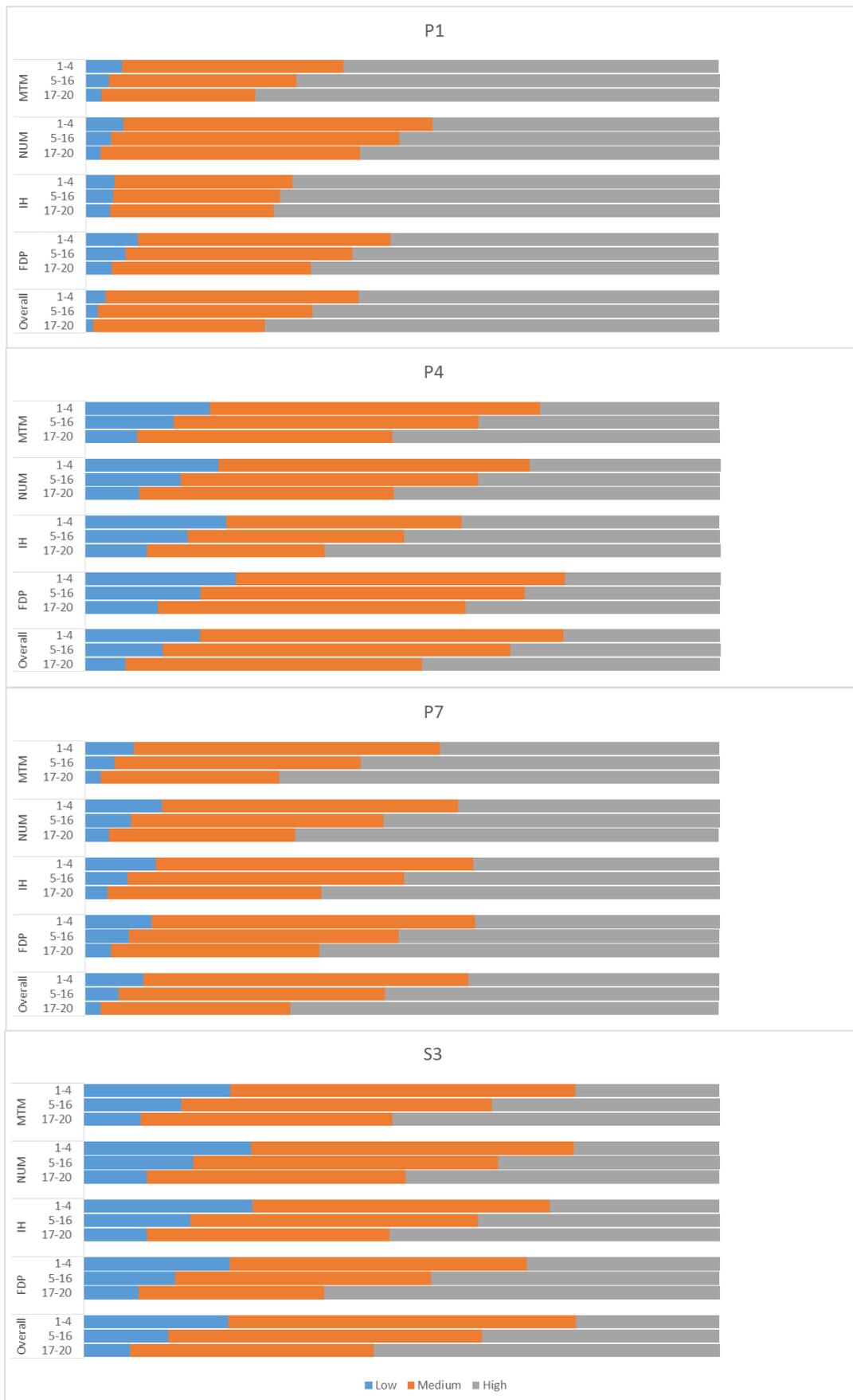
At S3, overall, there were also notably larger proportions of boys when compared with girls in the high capacity region. Larger proportions of girls attained a medium capacity when compared with boys. This difference was most marked when considering only assessment content related to the organiser Fractions, decimal fractions and percentages, where a majority of boys had results in the high capacity region for this organiser, while the results of girls were distributed in similar proportions across the medium and high capacity regions.

### **2.3.3 Scottish Index of Multiple Deprivation**

This section reviews the distribution of learners for all SNSA year groups across categories which reflect the Scottish Index of Multiple Deprivation (SIMD). To simplify the display of results and aid their interpretation, we used three categories to indicate levels of socio-economic background, namely: 1–4, indicating the bottom socioeconomic quintile (that is, the most deprived children and young people, those in vigintiles 1 to 4); 5–16, indicating the three middle quintiles (that is, those in vigintiles 5 to 16); and 17–20, indicating the top quintile (that is, the least deprived children and young people, those in vigintiles 17 to 20).

Chart 4 shows the proportions of numeracy capacity for these SIMD categories for all SNSA year groups, overall and when considering each of the four organisers.

Chart 4: Numeracy capacity distribution by SIMD and SNSA year



At each year group, it can be seen that the proportion of learners in the high capacity category was noticeably larger in the SIMD category that reflects the uppermost socioeconomic status (i.e. less deprivation), while the relatively larger proportions of learners with low capacity were observed in the SIMD category reflecting lower socioeconomic status. This pattern was present in all four year groups, overall and when considering each individual organiser.

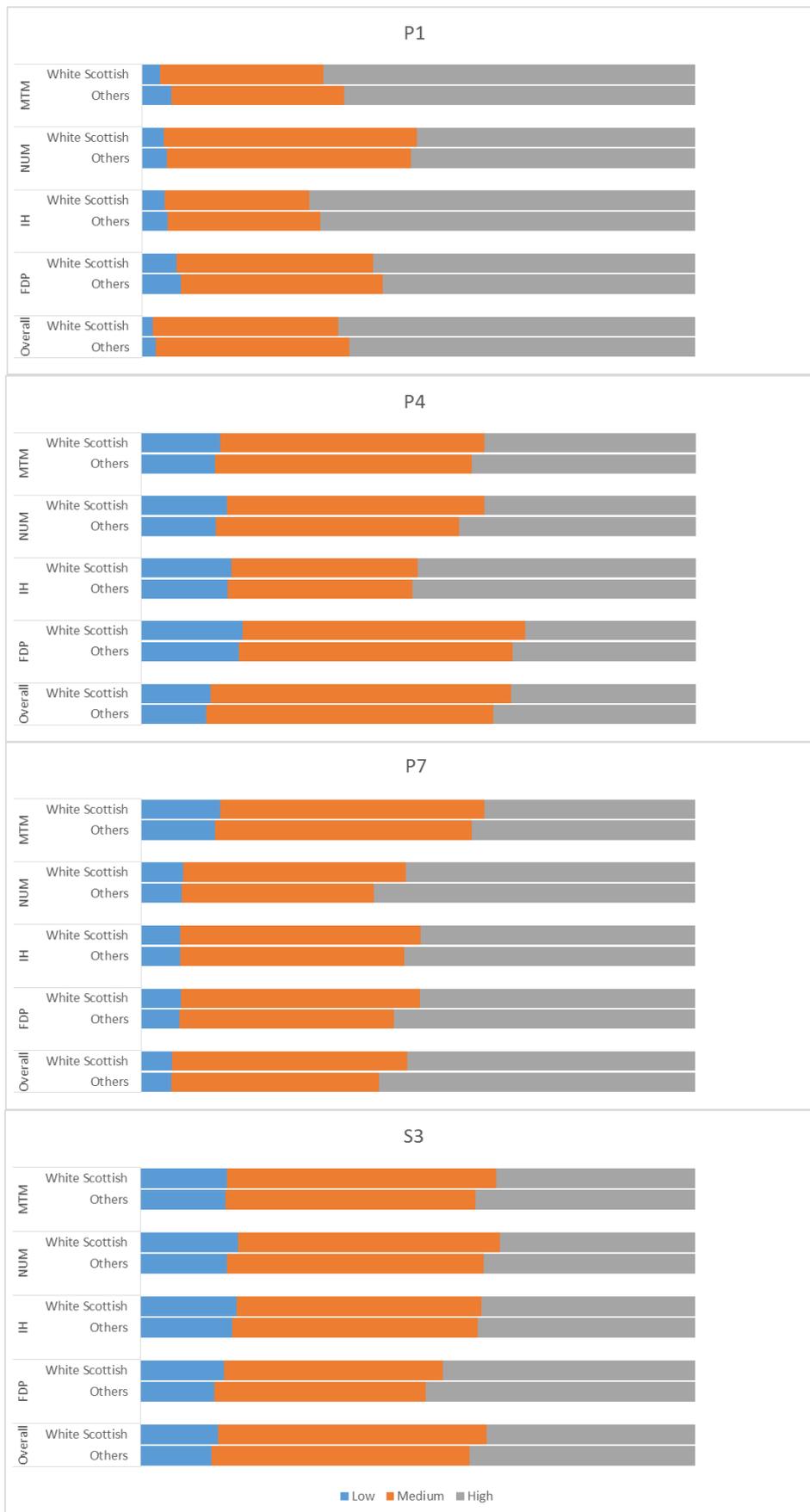
Chart 4 illustrates that the difference in numeracy capacity between children from the bottom quintile and the top quintile of SIMD was relatively smaller at P1, while it was more substantial at P4 and P7, and largest at S3. These observations apply both to overall capacity in numeracy and to each of the organisers in this learning area.

At P1, the majority of children demonstrated capacity in the high region for all organisers except Number, where slightly less than half of children in the bottom quintile demonstrated high capacity. In all other years, both overall and within organisers, high capacity for more than half of learners was mostly observed for those in the top quintile group. At S3, the year group where the largest proportion of learners was recorded in the low capacity region overall and for each organiser, among learners from the bottom quintile there tended to be roughly similar proportions in the low capacity category and the high capacity category overall and for all organisers except Fractions, decimal fractions and percentages.

#### **2.3.4 Ethnic background**

This section looks at differences in capacity between learners from 'White Scottish' and other ethnic backgrounds. Chart 5 shows the SNSA numeracy results for these two groups.

Chart 5: Numeracy capacity distribution by Ethnic Background and SNSA year



The results show that, generally, there were only very small differences across the two comparison groups, both in terms of overall capacity and when considering results for each of the organisers. At P1, among children from a 'White Scottish' background there were slightly higher proportions of learners with high capacity than among others. However, the proportions were of a similar size when considering only assessment material related to the organiser Number. Among learners at the higher year groups (P4, P7 and S3), both overall and for most of the organisers, there were slightly larger proportions with high capacity among learners from other ethnic backgrounds than among those from a 'White Scottish' background.

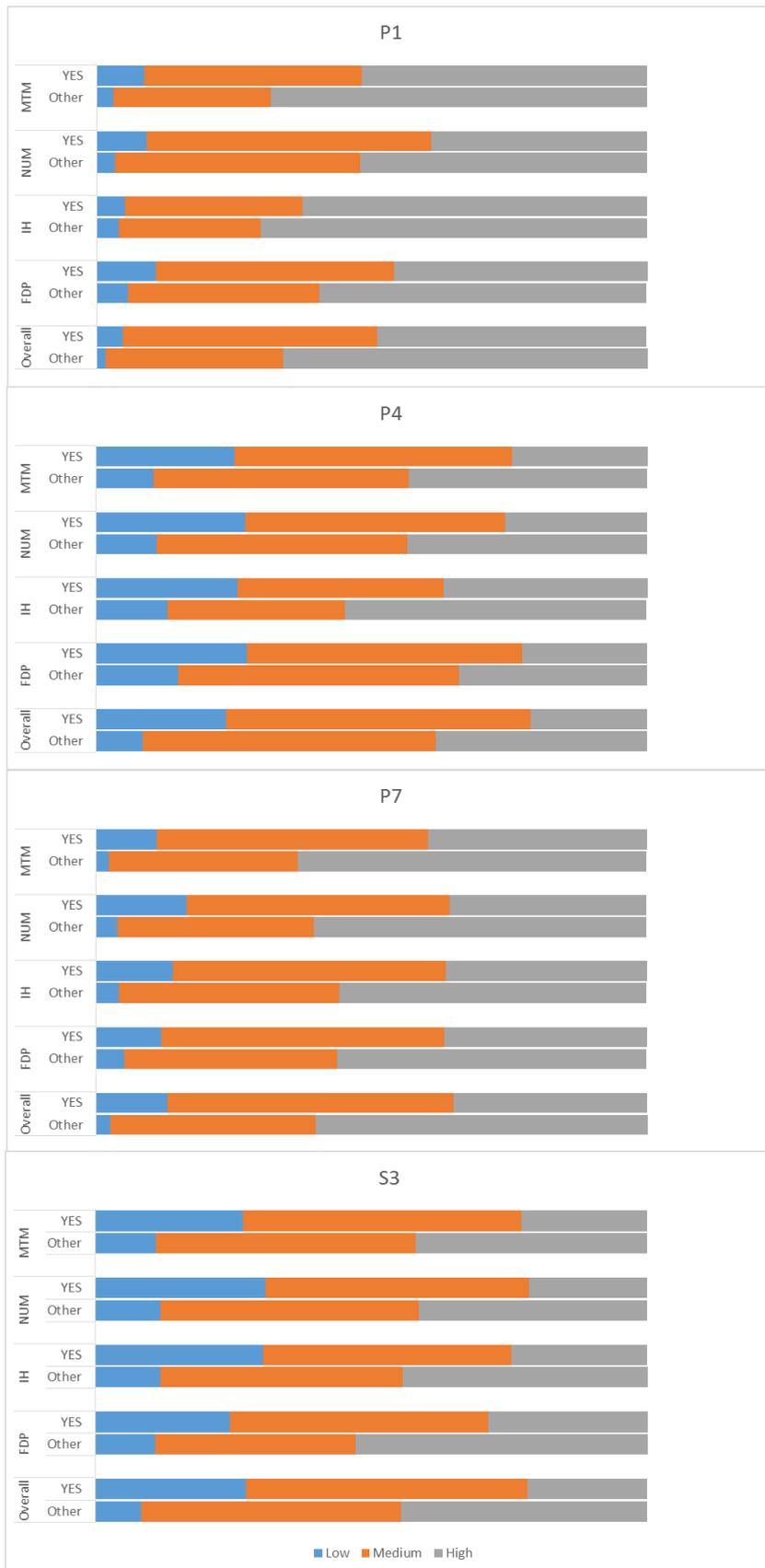
### **2.3.5 Free School Meal Registered**

Chart 6 shows the numeracy capacity of learners according to groups defined by registration for free school meals (FSE). This chart distinguishes those with registered entitlement from all other learners.<sup>5</sup>

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<sup>5</sup> The category 'Yes' refers to those learners whose record in SEEMiS, the national database, showed that they were registered for Free School Meals. The 'Other' category comprises both learners for whom there was a 'not registered' entry and those for whom there was no entry regarding free school meals.

Chart 6: Numeracy capacity distribution by Free School Meal Registered and SNSA year



In each of the four year groups, there were notably larger proportions in the high capacity group among learners without entitlement than among those with FSE, and there were correspondingly higher proportions in the low capacity group among learners with FSE. This pattern is similar across all year groups and also when considering results by organisers.

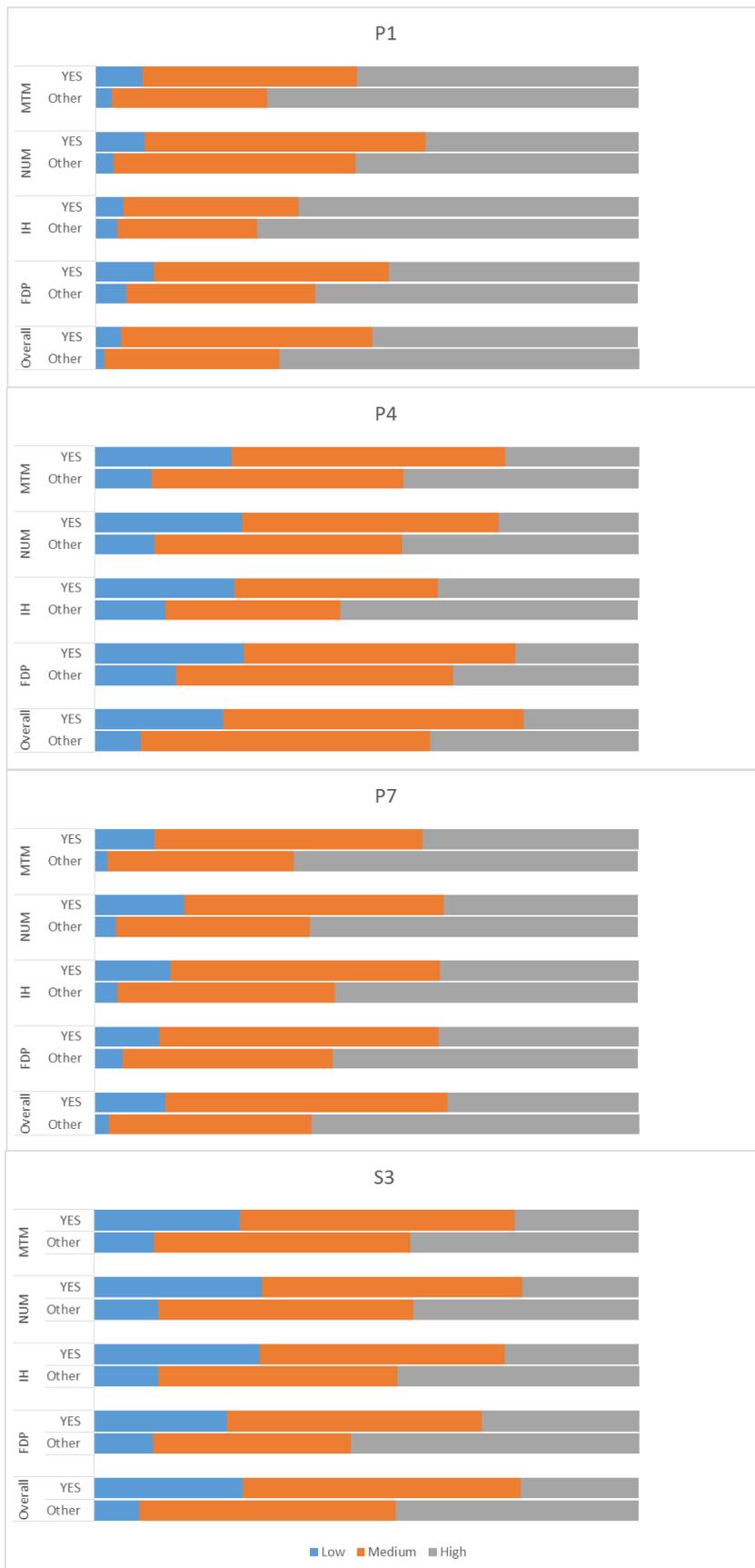
At P1 and P7, the majority of children without FSE showed high capacity, while for learners with this entitlement around a half for P1 and less than a half for P7 demonstrated capacity in this category. Differences between the two groups were roughly similar when considering each of the four organisers within these year groups. However, among P1 learners, the difference was somewhat smaller when considering only assessment content related to the organiser Information handling.

At P4 and S3, differences in proportions with high capacity between learners with and without FSE were similar to those in the other year groups, although at both year groups there were generally lower proportions of learners in this capacity region. The pattern was similar when reviewing results by organisers. At S3, overall and across organisers, the proportion of learners with FSE in the low capacity region tended to be equal to or larger than those with results in the high capacity region.

### **2.3.6 Additional Support Needs**

Chart 7 shows the proportions of learners with high, medium and low capacity across SNSA year groups, according to whether or not learners were identified as having Additional Support Needs (ASN).

Chart 7: Numeracy capacity distribution by ASN and SNSA year



Across all year groups, it can be seen that the proportions of learners in the high category were notably larger among learners with no ASN, and similarly, there were larger proportions of learners with ASN in the low capacity category. This pattern is present in all year groups.

At P1, differences in overall capacity between the two groups were somewhat smaller than in the higher year groups: the majority of learners without support needs showed high capacity but about half of learners with ASN also showed high capacity. In P1 at organiser level, a large proportion of ASN learners showed high capacity in two of the organisers (Measurement, time and money and Information handling). Less than half of learners identified as having ASN had results in the high capacity category for the other two organisers (Number and Fractions, decimal fractions and percentages). Additionally, there were more learners with ASN in the low capacity category in all organisers.

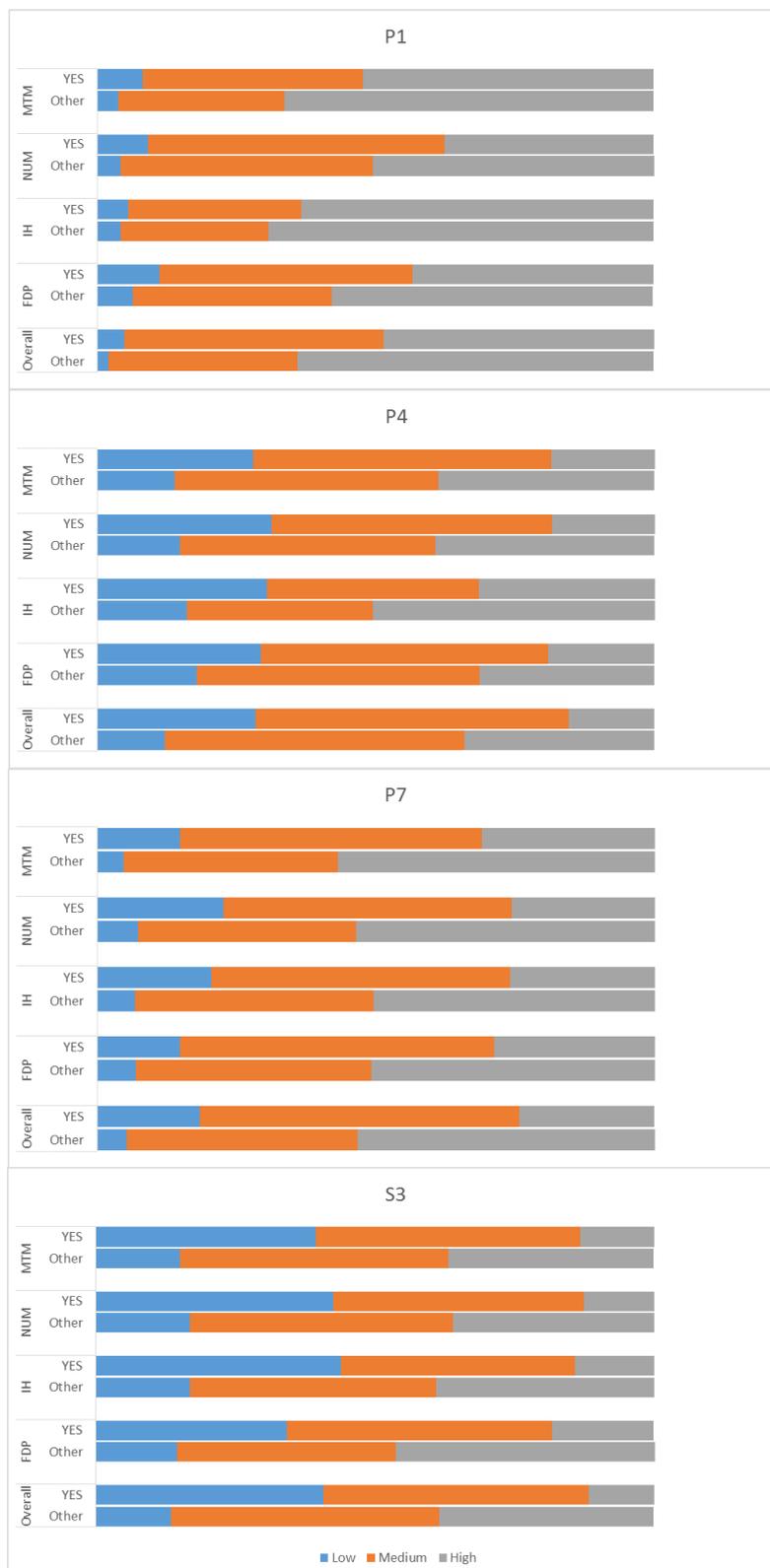
At P4 and S3, most learners with and without ASN demonstrated medium capacity overall, and this was the general tendency also when considering only assessment material for each of the individual organisers. However, the proportion of learners with ASN in the low capacity category was notably larger than for learners without ASN, and notably smaller in the high capacity category than in the comparison group.

At P7, the majority of learners without ASN demonstrated high capacity, while learners with ASN mostly fell within the medium capacity category. These learners were also more prominent, proportionally, in the low capacity category.

### **2.3.7 Looked After Children at Home and Looked After Children Away from Home**

Chart 8 shows the proportions of learners with high, medium and low capacity by categories of Looked After Children at Home (LAH) and Looked After Children Away from Home (LAA), in comparison with other learners, as classified within SEEMiS (the national database).

Chart 8: Numeracy capacity distribution by LAH/LAA status and SNSA year



Across all four year groups, it can be seen that among those learners who identified as LAH and/or LAA, there were notably smaller proportions demonstrating high capacity, while among other learners there were larger proportions demonstrating high capacity. Similarly,

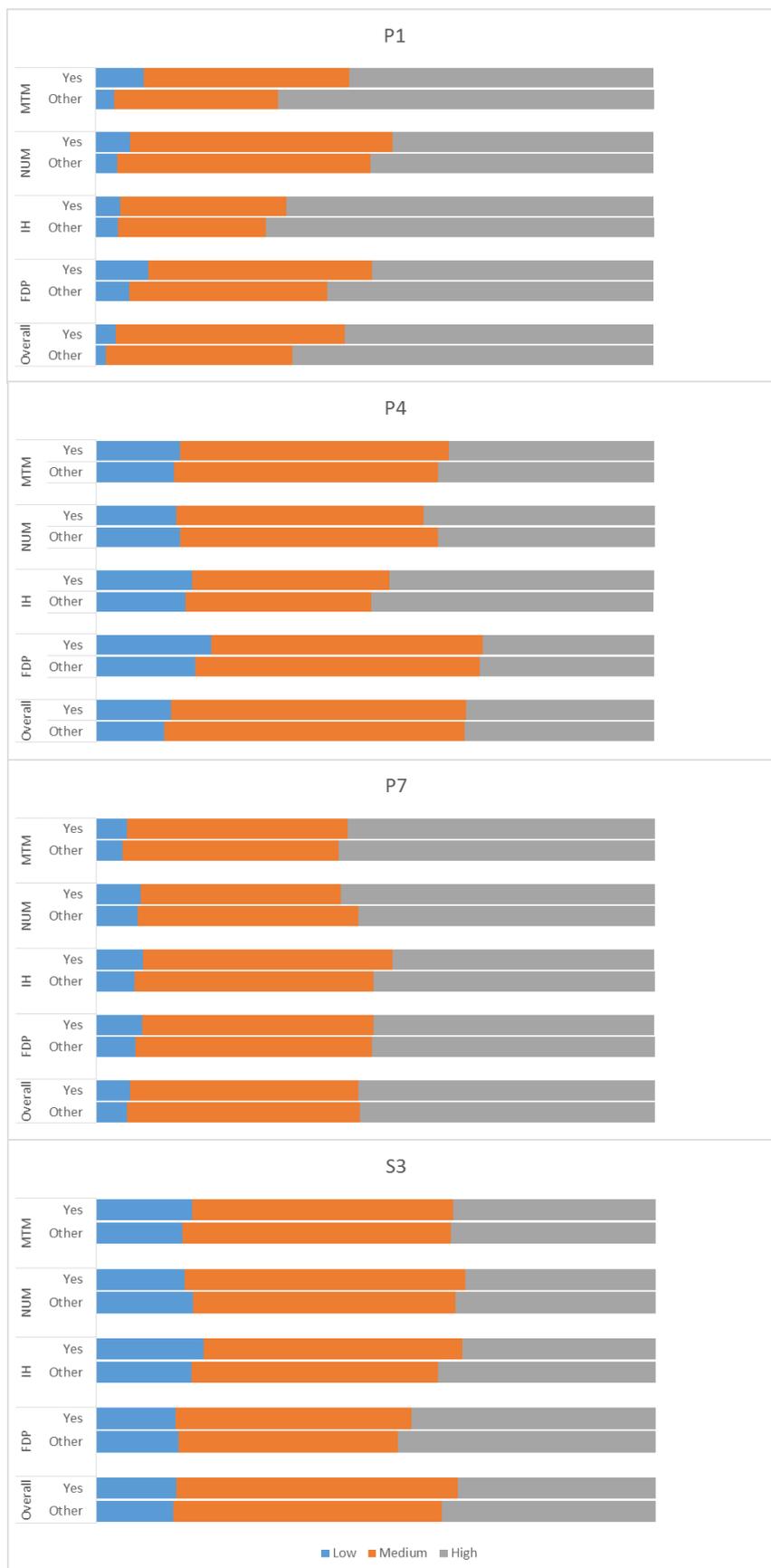
among learners who are LAH or LAA, there were higher proportions demonstrating low capacity than among other learners. This pattern is similar across all four year groups, both overall and when only considering assessment content related to individual organisers.

At P1, the differences between learners registered as LAH and/or LAA were somewhat smaller than in the other year groups, in particular, when considering only the organiser Information handling, where majorities in both groups of learners had results in the high capacity region. Differences among the two comparison groups were greatest at S3, where only few learners registered as LAH and/or LAA had results in the high capacity region.

### **2.3.8 English as an Additional Language**

Chart 9 shows the numeracy capacity of learners according to groups defined by language background: English as an Additional Language (EAL) and all other children and young people. The category 'Yes' refers to those learners whose record in SEEMiS showed that they had English as an additional language. The 'Other' category comprises both learners for whom there was a 'No' as the entry for EAL, and those for whom there was no entry in this field.

Chart 9: Numeracy capacity distribution by English as an Additional Language (EAL)



When comparing proportions of high, medium or low capacity between groups of learners for whom English is an additional language (EAL) and those for whom English is their first language, we observed relatively small differences in favour of learners in the latter group, both in terms of overall capacity and when considering only individual organisers (Chart 9). Similar patterns were observed across all four year groups.

At P1, differences between the two groups were slightly larger than in higher year levels (P4, P7 and S3). When comparing proportions across the organisers, similar differences between the two groups in favour of P1 learners for whom English is their first language were observed. The largest difference was recorded when considering only content related to the organiser Measurement, time and money.

## 3 Reading/Literacy

### 3.1 The scope of the reading/literacy assessment

#### 3.1.1 Reading and literacy for P1, P4, P7 and S3

For P4, P7 and S3, the assessments of reading and writing were delivered separately, while for P1, children were presented with a single assessment combining elements of reading and writing. This is referred to as the P1 literacy assessment. There were two reasons for combining reading and writing at P1. First, literacy skills tend to be quite integrated at this early stage of development (and may be referred to as ‘precursor’ or ‘component’ literacy skills). Secondly, a combined literacy assessment reduced the burden of the assessment, which was an important consideration for the very young children in this year group. The P1 literacy assessment was scaled with the reading assessments for higher stages, using the same set of curriculum organisers, and is therefore discussed in this section in conjunction with the results of the P4, P7 and S3 reading assessments.

The P1 literacy assessment comprised both stand-alone questions and units: groups of questions focusing on a single stimulus text. At P4, P7 and S3, all the reading questions were grouped into units of four or five questions, to economise on the reading load. Using this unit structure, questions of differing difficulty and covering different organisers could be asked with reference to the same text.

#### 3.1.2 Alignment with Curriculum for Excellence

In the SNSA academic year 2017 to 2018, the assessments of reading and P1 literacy were based on elements of Curriculum for Excellence (CfE), as articulated in the literacy elements of the *Benchmarks: Literacy and English*, published as a draft in August 2016. It should be noted that for the academic year 2018 to 2019, the final version of the *Benchmarks* (published in June 2017) is used as the reference point for the assessments.

#### 3.1.3 A note on texts used in SNSA reading assessments

For SNSA reading, a broad definition of texts was used, in line with the statement in *Benchmarks: Literacy and English* (draft August 2016): ‘Challenge in literacy ... involves engaging with a wide range of increasingly complex texts which are suitable to the reading age of each learner.’ In SNSA, this range includes narrative fiction and non-fiction, description, exposition, argument and instructions. A further dimension to the definition of texts in SNSA reading relates to format, as described in *Curriculum for Excellence: Literacy and English, Principles and Practice*: ‘Texts can be in continuous form, including traditional formal prose, or non-continuous, for example charts and graphs.’

### 3.2 Coverage of the Curriculum for Excellence: benchmarks and organisers

SNSA are just one part of the range of assessments that teachers use in making their evaluations of children’s and young people’s learning. As a standardised assessment to be completed within a limited time, and using questions capable of being scored automatically, only some parts of the specified reading benchmarks could be addressed. In consultation with Scottish literacy experts, it was agreed that the reading and P1 literacy assessments should be based on the organisers Tools for reading (TFR), Finding and using information (FUI), and Understanding, analysing and evaluating (UAE). Each of the questions selected for

inclusion in SNSA reading and literacy assessments for the academic year 2017 to 2018 was aligned with a benchmark statement from one of these organisers.

Although all three organisers are represented in the P1, P4, P7 and S3 reading assessments, there were different proportions across the year groups. In the reports provided to schools, teachers received information about organiser-level capacity if the learner was presented with at least five questions from the organiser. Similarly, in this report, results for organisers that were addressed by at least five questions in the year group's full set are analysed. The organisers included in the reports are shown by stage, in Table 1.

Table 1: Reporting organisers for reading by stage, academic year 2017 to 2018

Stage	Organisers
Primary 1	Tools for reading Understanding, analysing and evaluating
Primary 4	Finding and using information Understanding, analysing and evaluating
Primary 7	Finding and using information Understanding, analysing and evaluating
Secondary 3	Finding and using information Understanding, analysing and evaluating

The following sections provide more information on each of the reading organisers in SNSA 2017 to 2018, along with some example items. These items are not used in SNSA 2018 to 2019, and they will not be used in future Scottish National Standardised Assessments.

### 3.2.1 Tools for reading

In the P1 assessment, this organiser comprised questions related to phonological awareness, word decoding and word recognition; in the assessments for the higher year groups, assessment content mainly referred to learners' use of strategies to work out the meaning of words. The P4, P7 and S3 assessments contained relatively small numbers of questions from this organiser in the academic year 2017 to 2018.

Figure 10 shows a typical question from the 2017 to 2018 academic year P1 literacy assessment, which reflects the organiser Tools for reading. It is designed to assess children's knowledge of sounds (phonological awareness). Note that the 'mouth' icon indicates to the learner that there is a voiced component to the question, enabling the child to listen to the instruction and response options.<sup>6</sup> In this case, clicking on the icon prompts a reading of the question text to the child, including the answer options.

<sup>6</sup> P1 children were shown how to use the 'mouth' icon in practice assessments and it is used throughout the literacy and numeracy assessments for this stage.

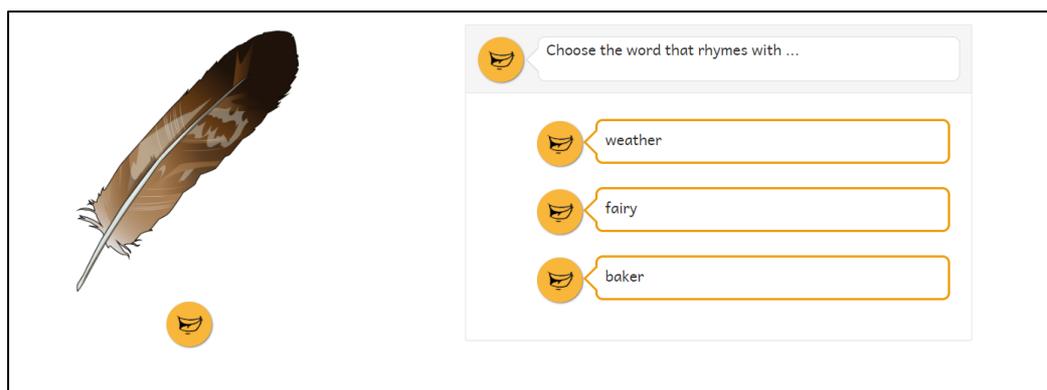


Figure 10: Example of a P1 Tools for reading question, 'Rhyming word – feather'

This question asks the child to identify aurally presented rhyming words, a skill which, in English, is a key precursor to mastery of reading. While children might have used decoding skills to read the words 'weather', 'fairy' and 'baker', they are not expected to do so; this is a question designed to assess whether children can hear and recognise rhyming sounds. Hence, the word 'feather' is only presented aurally, with pictorial support. This means that the focus of the question is unambiguously on phonological awareness rather than decoding. This question was classified as of medium difficulty. It was presented to children who were progressing relatively successfully through the assessment, and of these learners, the majority was able to answer it correctly.

Figure 11 shows another example of a P1 Tools for reading question.

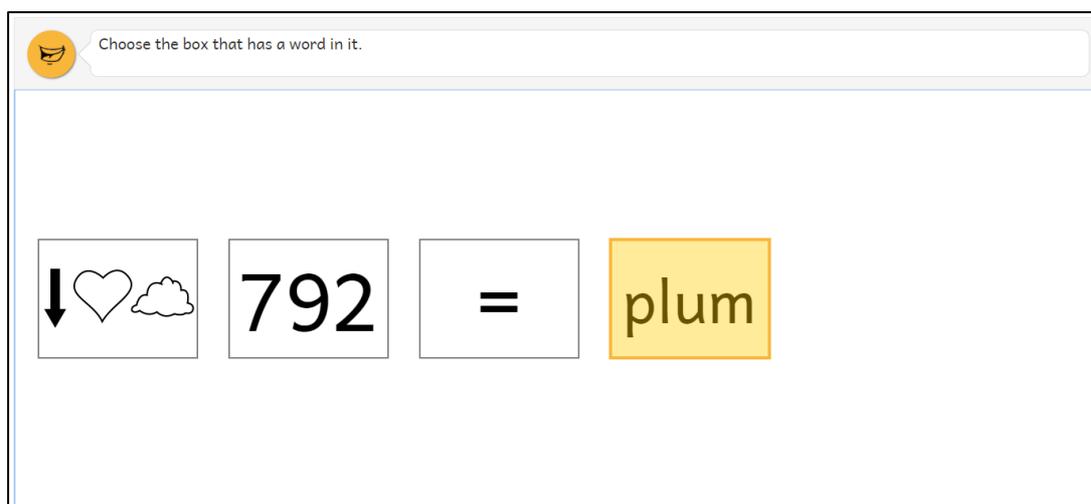


Figure 11: Example of a P1 Tools for reading question, 'Select the word'

This question draws on a child's word recognition skills, which is part of very early literacy development. It required learners to identify a word from a set of options including numbers and symbols. An audio prompt provided support to the onscreen instruction. In this case, learners were not required to decode the word, or demonstrate understanding of its meaning. This question was answered correctly by almost all the learners presented with it in the assessment.

### 3.2.2 Finding and using information

This organiser focuses on the critical literacy skills of locating information in a text and employing the information to meet a purpose. These skills are often applied in the context of non-fiction texts but can also be applied to fiction. In SNSA, questions for P1 and P4 learners that corresponded to this organiser generally focused on finding information that was literally stated, or required a low level of inference (for example, recognising synonyms linking the question with the text). More advanced questions addressing similar skills – for P7 and S3 – were likely to be applied to longer and more complex texts. At P7, the organiser Finding and using information also included questions requiring learners to sort information in a text into relevant categories. The S3 reading assessment presented Finding and using information questions that asked young people to find key information in one or more texts, or to make connections between the information they located, sometimes across more than one text.

Figure 12 shows a typical question from the P4 reading assessment for academic year 2017 to 2018, from the organiser Finding and using information. The stimulus for this question is a narrative fiction text of typical length within the context of the P4 reading assessment, and mainly uses relatively simple vocabulary and language structures. The question presented here required children to find information in the fiction text.

## Cawky

My best friend is a big, black crow. He is the type of bird that farmers, amazingly, want to scare away.

I call him Cawky because every morning he wakes me up screeching, "Caw! Caw! Caw!" outside my window.

This morning, he left a small stick for me on the window ledge. It's of no use to me, but it's a gift from Cawky and I will cherish it, just like the stones and leaves that he has brought me. I keep them all in a box under my bed. I call it my treasure box.

Cawky always seems to know how I am feeling. One time when I was sad, he did a little dance for me with a feather in his beak. It was so funny and it made a big difference to my mood that day.

Last week I was in a panic before school because I couldn't find my bag. Then Cawky tapped on the window and pointed with his beak towards my desk. My bag was under the desk! I am so happy that Cawky is my friend.



How did Cawky get his name?

from the gifts he brings

from the dance he does

from the sound he makes

from the colour of his feathers

Figure 12: Example of a P4 reading text with a Finding and using information question, 'Cawky Question 1'

This question asks the child to locate a paraphrased detail in the text. The information is located near the beginning of the text, and uses familiar synonymous language as support to help the child link the information in the text to the correct answer. The word 'screeching' relates to the answer option 'sound'. The onomatopoeic word 'Caw' is shown to be a sound both through the introductory 'screeching' and the use of quotation marks. Finally, 'Caw' has a clear link to the name Cawky in the question stem. This question was classified as having low difficulty for P4 learners and was answered correctly by most learners who were presented with it.

A more difficult question from the Cawky unit is presented below, in the section on Understanding, analysing and evaluating.

Figure 13 shows a Finding and using information question from the P7 reading assessment for 2017 to 2018. The stimulus for this question is a descriptive, non-fiction text. While the text is still relatively short, in comparison with the P4 example text in Figure 12, it uses more

complex vocabulary, including some technical terminology, and the sentences are longer and use more complex structures, providing children in P7 with greater challenge.

### Aphids

Aphids are small plant-eating insects, sometimes referred to as plant lice or green flies. They have existed for an estimated 280 million years. There are about 4000 different kinds of aphid.

Aphids are among the world's most destructive insect pests. They are often infected by bacteria or viruses that weaken or infest the plants the aphids feed on. This has made them enemies of farmers and gardeners worldwide.

Because aphids are weak fliers they generally only migrate when they are forced to by the death of a host plant, environmental changes or enemy attack. Then, they often take advantage of favourable winds to enhance their flight efficiency.

Most aphids have soft, green bodies. They use their needle-like mouthparts to suck sap from stems or leaves of plants. Plant sap is rich in sugar, which results in aphids secreting large amounts of sugary liquid, called honeydew, from their cornicles.

Honeydew is the perfect food for adult ants, which is why some ants "farm" aphids. These "dairying ants" use their antennae to stroke the aphids to make them release the honeydew. This does not harm the aphids. Some dairying ants even build shelters for the aphids. The ants also protect the aphids from enemies, such as ladybirds, which feed on aphids. Ladybirds are much bigger than ants, but the ants try to make them leave by biting them and spraying them with acid.



What does the text say about aphid migration?

Aphids migrate regularly.

Aphids stay in the same place if they can.

Aphids rely on other insects to help them migrate.

Aphids are most easily attacked when they migrate.

Figure 13: Example of a P7 reading stimulus text with a Finding and using information question, 'Aphids Question 4'

The question presented here required children to select relevant information from a non-fiction text. Despite the very clear link between the key term 'migration' in the question prompt and 'migrate' in the text, which draws the learner to the location of the relevant information, in other ways this question is considerably more difficult than the P4 example provided in Figure 1312. It is not only the text that is more complex, but the question itself, which relies on more sophisticated skills and understanding than the simple synonymous matching in 'Cawky Question 1'. Although this text quite clearly states that aphids only migrate if they find themselves in unfavourable conditions, learners must infer from this that they otherwise stay where they are. Alongside the need to interpret, a second challenge in this item comes from the need to negotiate strongly competing details both within the same sentence and later in the text. The fourth option in particular proved a strong distractor for learners, possibly because the information about enemy attacks was very close to the correct answer in the text, and because of the repeated reference to 'enemies' at the end of the text.

This unit was only seen by children if they did relatively well in the first phase of the assessment and the question was classified as having high difficulty. Of the learners presented with this question, a large minority answered it correctly.

A less difficult question from this unit is presented in the discussion of the organiser Understanding, analysing and evaluating which follows.

### 3.2.3 Understanding, analysing and evaluating

The essence of this organiser is comprehension, beginning with word and sentence level texts (for learners at P1) and with progressively longer and more complex passages of text providing greater challenge across all the reading assessments. While questions for the P4 assessment tended to focus on main or prominent ideas, learners at P7 and S3 were asked to answer a range of literal, inferential and evaluative questions that, for example, might require learners to distinguish between fact and opinion, recognise persuasive language,

use evidence from a text to support answers, or evaluate the reliability and credibility of texts.

Figure 14 is an example of a P1 question from the organiser Understanding, analysing and evaluating. It assesses reading comprehension at sentence level. In this kind of question, the child chooses an answer by clicking on a word in the sentence. This skill was modelled in the practice assessment.



Figure 14: Example of a P1 Understanding, analysing and evaluating question, ‘Sentence comprehension’

This item was rated as having high difficulty. While the instruction (‘Read the sentence below ...’) can be read to the learner using the audio button, the sentence itself has no audio support. In contrast to the Tools for reading question ‘Rhyming word – feather’ presented in Figure 10, the child is required to read independently. As well as being able to decode the words, the child needs to track the pronoun reference ‘she’ and interpret the meaning of ‘but’. This question therefore relies on understanding information, rather than just finding and using it. The majority of P1 children presented with this question was able to complete it successfully.

It can be seen that the example question shown in Figure 14 requires the child both to decode the words (that is, to read independently) and to understand the meaning of the sentence. Another approach to assessing the development of reading comprehension at the earliest stages is to present written texts orally. This is because young children may have higher skills in comprehension than their decoding skills allow them to demonstrate. Accordingly, at P1, a combination of written texts with audio support and without audio support was used to assess the skills, knowledge and understanding associated with the organiser Understanding, analysing and evaluating.

Figure 15 shows a P4 Understanding, analysing and evaluating question. This was the last of the five questions related to the text Cawky, which is included in Figure 12 above.

What is this story mainly about?

what games Cawky and the child play together

how Cawky and the child became friends

how Cawky makes the child happy

what farmers think about Cawky

Figure 15: Example of a P4 Understanding, analysing and evaluating question, 'Cawky Question 5'

This question asks children to identify the main idea in a narrative, one of the key skills included in Understanding, analysing and evaluating in the P4 reading assessment. This question, rated as having high difficulty, was the most challenging question asked about the Cawky text. The most commonly chosen incorrect answer was the second option, and this is likely to be because of the explicit references to friendship both at the beginning and end of the passage. A large minority of the learners who saw this question answered it correctly but the majority of those who demonstrated higher overall capacities on the P4 reading assessment responded successfully.

Figure 16 shows a P7 reading question that addresses the organiser Understanding, analysing and evaluating. It was the third question presented to children about the information text Aphids, presented in Figure 13 above.

Which of these best describes the relationship between dairying ants and aphids?

Only the aphids benefit.

Only the dairying ants benefit.

Both the dairying ants and aphids benefit.

Neither the dairying ants nor the aphids benefit.

Figure 16: Example of a P7 Understanding, analysing and evaluating question, 'Aphids Question 3'

This question asks children to identify the nature of an unusual relationship in a scientific text. To answer this question successfully, children must understand and synthesise information contained across all sentences in the final paragraph of the text, before evaluating the relationship that is suggested. This question was rated as having medium difficulty in the assessment. It was presented to learners who had done relatively well in the first phase of the assessment and was answered correctly by the majority of these learners.

Reflecting the importance of the skills in this organiser within CfE, the majority of questions in the S3 reading assessment for 2017 to 2018 focused on Understanding, analysing and evaluating. Like the reading assessments for P4 and P7, the texts used for the S3 assessment covered a range of text types, contexts and topics, from narrative through to information or persuasive texts, and fiction through to scientific texts or blogs. As would be expected, the texts for S3 were generally longer and more complex than for the lower stages. The text in Figure 17 is an example of a typical text for S3.

## Shill Reviewing

Customers who shop online cannot inspect the products to check their quality. Other customers' reviews can provide some guidance. But are these reviews reliable? It is possible that some of these reviews were written by the company that makes the product. This process is called "shill reviewing" and it is commonly found on websites.

### Customer Reviews

**88 Reviews**

5 star:	(64)	<b>Average Customer Review</b> ★★★★☆ (88 customer reviews)
4 star:	(14)	
3 star:	(5)	
2 star:	(1)	
1 star:	(4)	

★★★★☆ **High Comfort, September 18, 2016**

By **Bryon** - [See all my reviews](#)

I just bought my second pair of this wonderful design. These shoes feel great, forever.

The following advice from Internet shopping guru Kristen O'Reilly will help you to identify a shill review.

- Look out for reviews that use over-the-top phrases like "by far the best..." and "the greatest ever". If they appear too good to be true, they probably are.
- When a new product enters the market, the manufacturer will sometimes generate interest by planting a few favourable comments. When there are lots of reviews, the chance of these being shill reviews is reduced.
- The more reviews a particular customer has written, the more likely the reviewer is to be genuine. Customers who have posted just a couple of (overwhelmingly positive) reviews should be treated with caution, particularly if that reviewer has only been reviewing products by the same manufacturer.
- If a product has been receiving only negative reviews and then suddenly receives a run of really amazing comments, these are likely to be shill reviews.
- It is not uncommon for a shill reviewer to write reviews by logging in under different usernames. If two reviews are written in a similar style and are equally glowing, they may have been written by the same person, particularly if they were posted around the same time.

Figure 17: Example of an S3 Understanding, analysing and evaluating text, 'Shill Reviewing'

Shill Reviewing is an example of a non-continuous information text that includes prose, graphical information and a list, and which also includes persuasive language. Although the vocabulary is non-technical and the sentence structures are relatively simple, the different text formats and the overall argument must be integrated by the reader, providing a higher degree of challenge than the texts presented previously in this report.

Figure 18 shows a Shill Reviewing question reflecting the organiser Understanding, analysing and evaluating.

Kristen O'Reilly would probably not believe a reviewer who has written

---

only a small number of reviews.

---

reviews using the same username.

---

both positive and negative reviews.

---

reviews of many different products.

Figure 18: Example of an S3 Understanding, analysing and evaluating question, 'Skill Reviewing Question 4'

Questions in this organiser at S3 asked young people to demonstrate skills such as interpreting main ideas or details of a text, comparing or contrasting elements within it, or reflecting on its audience or purpose. In Skill Reviewing Question 4, an inference must be drawn by comparing and contrasting the range of views expressed in the text. This question was rated as having high difficulty and a minority of those learners to whom it was presented answered it correctly.

In contrast, almost all learners presented with the question shown in Figure 19 below answered it correctly, including a majority of learners who demonstrated lower capacities in the S3 reading assessment overall. This item was also from the Understanding, analysing and evaluating organiser.

Who is the intended audience of this article?

---

online shoppers

---

website developers

---

writers of skill reviews

---

product manufacturers

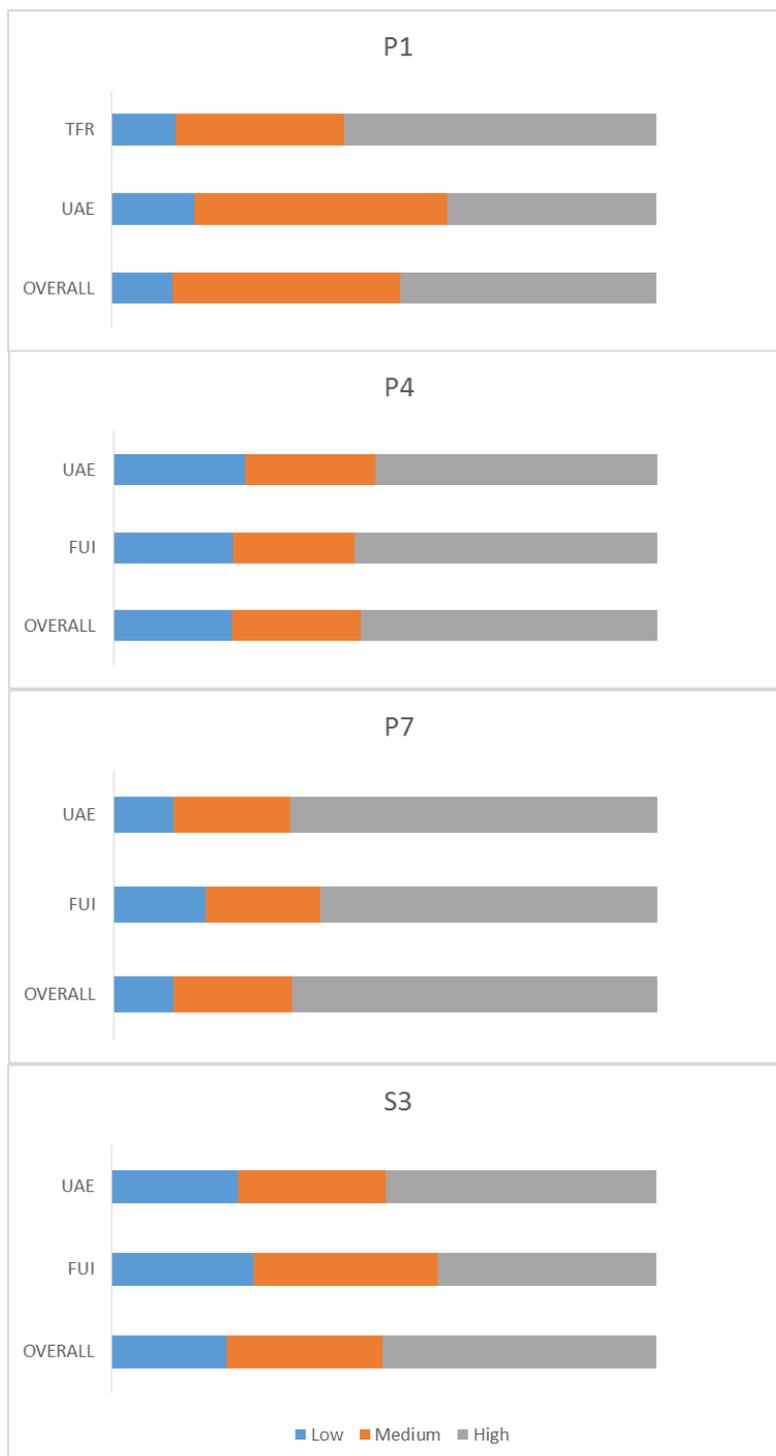
Figure 19: Example of an S3 Understanding, analysing and evaluating question, 'Skill Reviewing Question 2'

### 3.3 National results for reading

#### 3.3.1 Overall capacity

Chart 10 shows the overall capacity for reading across all four year groups (P1, P4, P7 and S3) and capacity in relation to the three reading/literacy organisers Tools for Reading (TFR), Understanding and Evaluating (UAE), and Finding and Using Information (FUI). Regions show high, medium and low capacity, in line with SNSA reports for the 2017 to 2018 academic year, which are specific to each year group.

Chart 10: Reading capacity by SNSA year



At P1, nearly half of the children showed high capacity, with most of the others showing medium capacity. Very few children showed low capacity. A majority of children in P1 showed high capacity with regard to the organiser Tools for reading, while for Understanding, analysing and evaluating, the highest proportion (somewhat less than half) of children showed medium capacity. Across the two organisers, few children were found in the low capacity groups.

At P4, a majority of the learners demonstrated high capacity, while lower proportions showed low and medium capacity. For the two organisers (Understanding, analysing and

evaluating and Finding and using information), the majority of children demonstrated high capacity, with broadly similar proportions in the medium and low capacity categories.

The majority of learners at P7 demonstrated high capacity on their reading assessment, while only relatively small proportions demonstrated low capacity. There was a slightly larger proportion of learners with high capacity for the Understanding, analysing and evaluating organiser compared with proportions for Finding and using information.

At S3, overall, about half of the learners demonstrated high capacity. There was a somewhat lower proportion in the high capacity region when considering only the organiser Finding and using information, compared to the proportion of learners with high capacity in relation to the organiser Understanding, analysing and evaluating.

Evidence from educational research suggests that learning growth differs according to the stage of schooling. Bearing in mind that individuals experience growth spurts and plateaus in different ways, research indicates that, on average, younger learners tend to advance in their learning more rapidly than older ones, where progress typically continues, but at a slower pace. The two SNSA norming studies<sup>7</sup> carried out in Scotland in the academic year 2017 to 2018, in the first and second halves of the academic year, confirmed that these findings also hold for reading and literacy acquisition among Scottish learners.

Chart 11: Reading capacity across norming study time periods

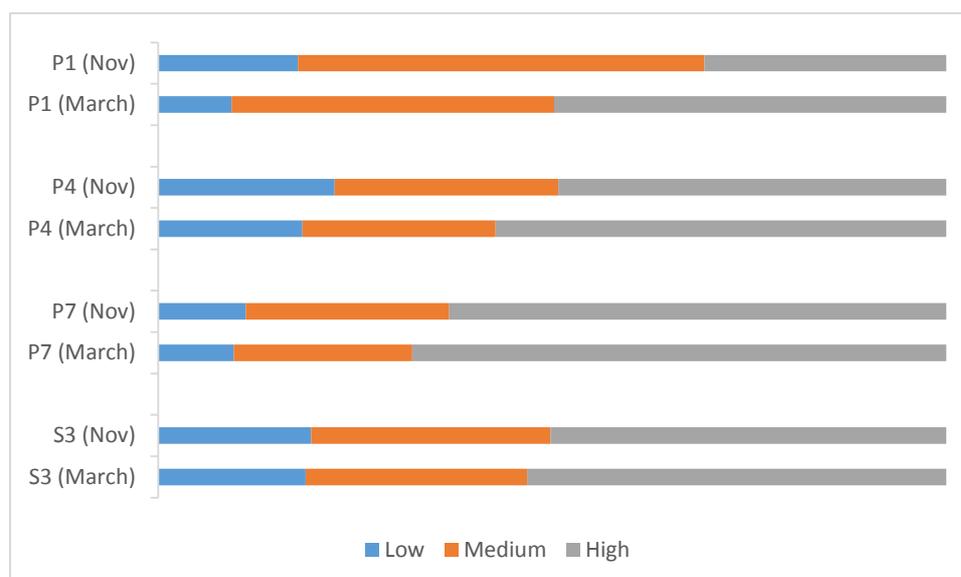


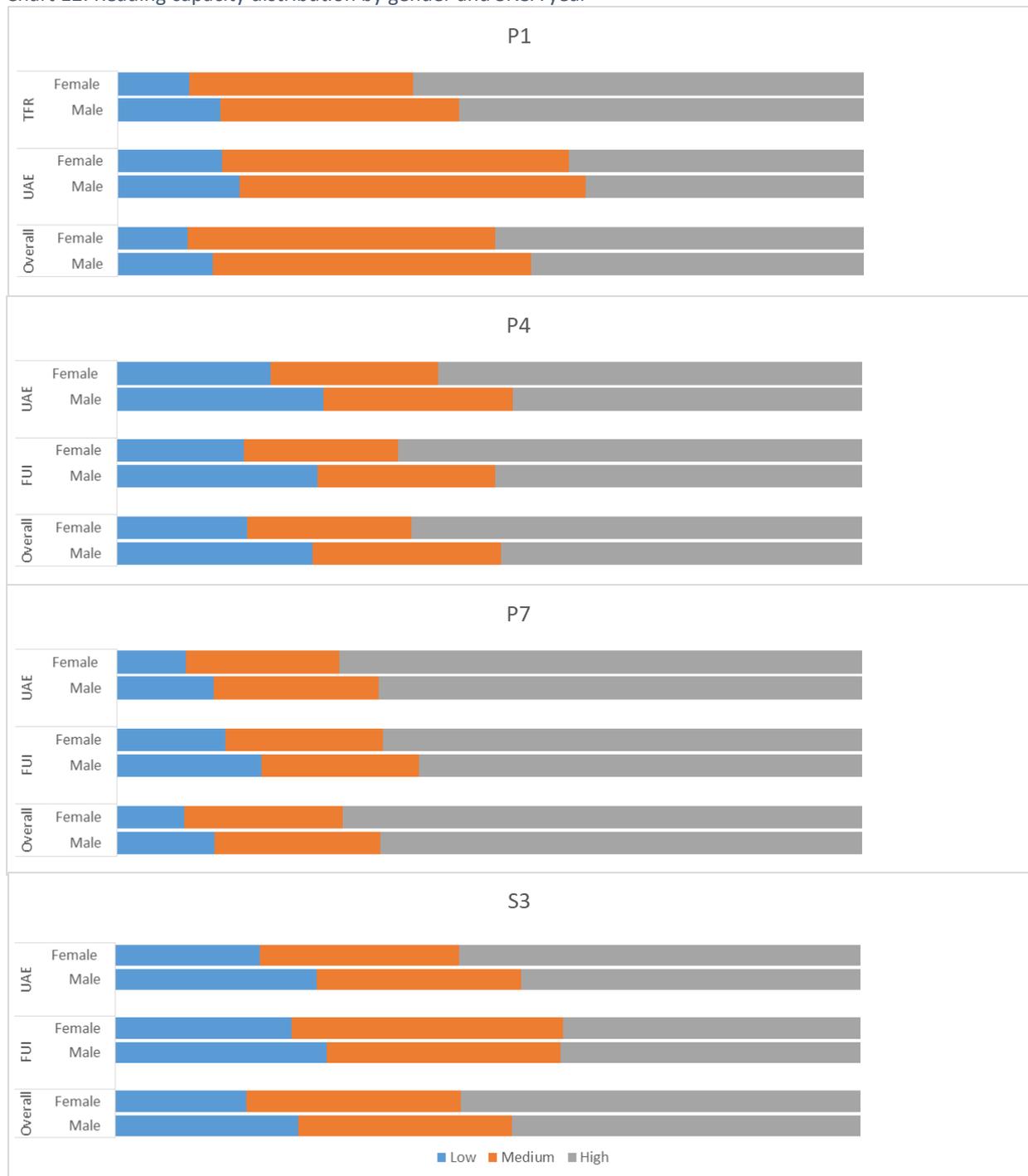
Chart 11 shows that between November and March, in all four year groups, there were increases in the proportions of learners who showed high capacity. This increase was most prominent among learners at P1, with regard to their literacy development, while among learners at P4 there were relatively smaller but still noticeable increases in the proportion of learners with high capacity. These increases between the first and second norming study in high capacity learners were somewhat less marked at P7 and S3.

<sup>7</sup> Results from the norming study were used for the purpose of providing representative sample survey data collected at clearly defined assessment periods during the school year.

### 3.3.2 Gender

Chart 12 shows the proportions of literacy and reading capacity among boys and girls for all SNSA year groups, overall and when considering each of the two organisers.

Chart 12: Reading capacity distribution by gender and SNSA year



For all year groups, capacity among boys and girls was similar in that the largest proportions of learners were found in the high capacity category, both overall and when considering each of the organisers separately. However, there were differences worth noting between the two gender groups, with consistently larger proportions of girls than boys demonstrating high capacity. At P1, while for both organisers there were somewhat larger

proportions of girls in the high capacity region than boys, these differences were smaller when considering the organiser Understanding, analysing and evaluating.

At P4, a notably larger proportion of boys than girls demonstrated low overall capacity and a parallel difference was evident in the high capacity region, where the proportion of girls was larger than boys. These results were also observed when considering separately the two organisers Finding and using information and Understanding, analysing and evaluating.

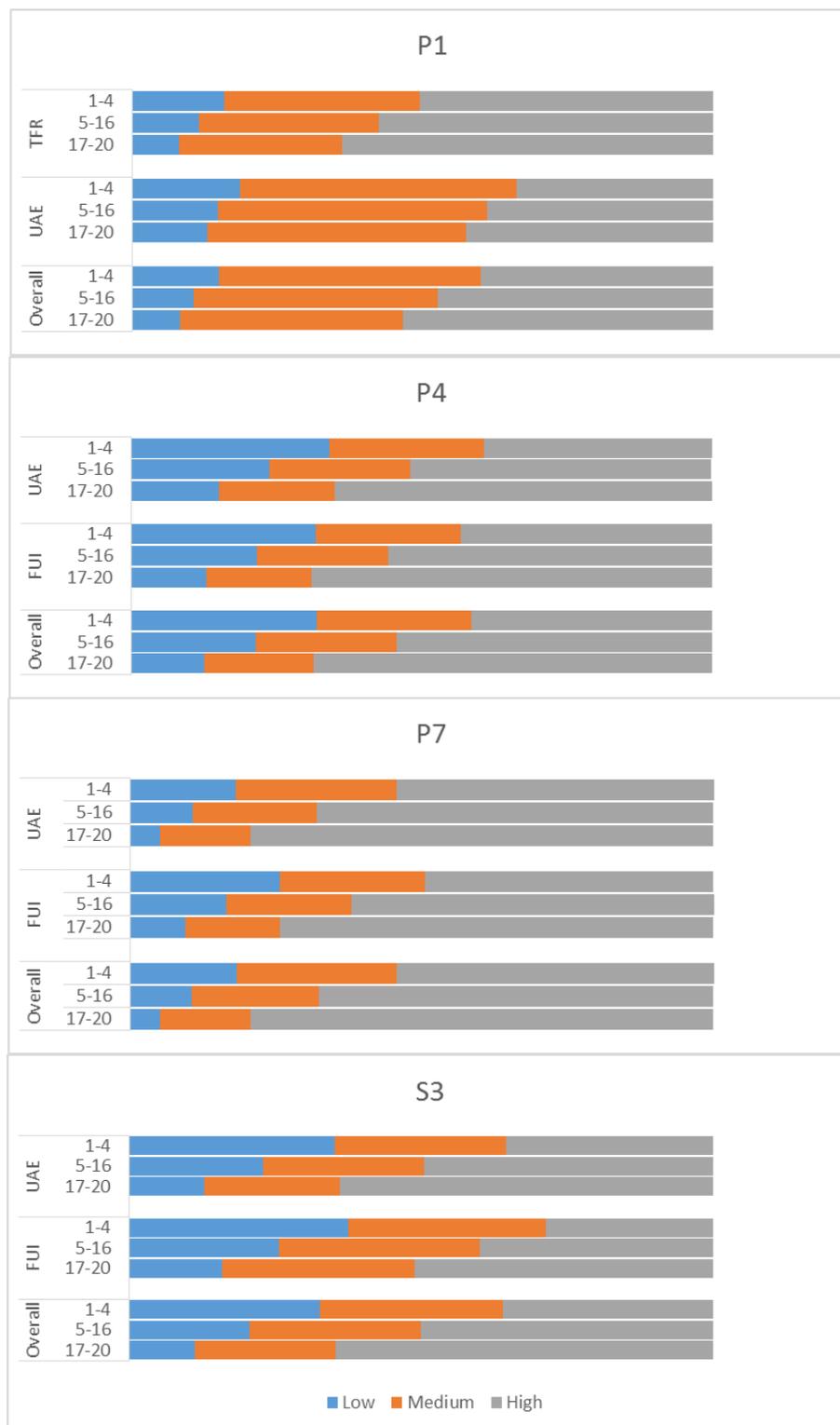
At P7, larger proportions of girls than boys demonstrated high capacity, although the differences were somewhat smaller than among learners at P4. This finding holds overall and when considering the two organisers separately.

At S3, there was also a notably larger proportion of boys than girls demonstrating low capacity overall, while larger proportions of girls than boys demonstrated a high capacity. This gender difference was more marked with regard to the organiser Understanding, analysing and evaluating. However, the proportions of girls and boys demonstrating high capacity were similar with regard to the organiser Finding and using information.

### **3.3.3 Scottish Index of Multiple Deprivation**

Chart 13 shows the distribution of learners for all SNSA year groups across categories reflecting the Scottish Index of Multiple Deprivation (SIMD). To simplify the display of results and aid their interpretation, we used three categories to indicate levels of socioeconomic background, namely: 1–4, indicating the bottom socioeconomic quintile (that is, the most deprived children and young people, those in vigintiles 1 to 4); 5–16, indicating the three middle quintiles (that is, those in vigintiles 5 to 16); and 17–20, indicating the top quintile (that is, the least deprived children and young people, those in vigintiles 17 to 20).

Chart 13: Reading capacity distribution by SIMD and SNSA year



At each year group, it can be seen that the proportions of learners in the group with high capacity was much larger in the SIMD category which reflects a higher socioeconomic status (i.e. less deprivation), while the relatively higher proportions of learners with low capacity were found in the SIMD category reflecting lower socioeconomic status. This pattern was present in all four year groups, overall and when considering only assessment items corresponding to each of the two organisers at each year group.

Chart 13 illustrates that the difference in literacy and reading capacity between children from the bottom quintile and the top quintile of SIMD was relatively small at P1, while it was more substantial at P4 and P7, and greatest at S3. These observations apply both to overall capacity and to each of the reading organisers.

At P1, more children in the bottom quintile than in the top quintile demonstrated capacity in the low region, while larger numbers of children in the top quintile showed high capacity. These differences were somewhat larger when considering only assessment items pertaining to the organiser Tools for reading.

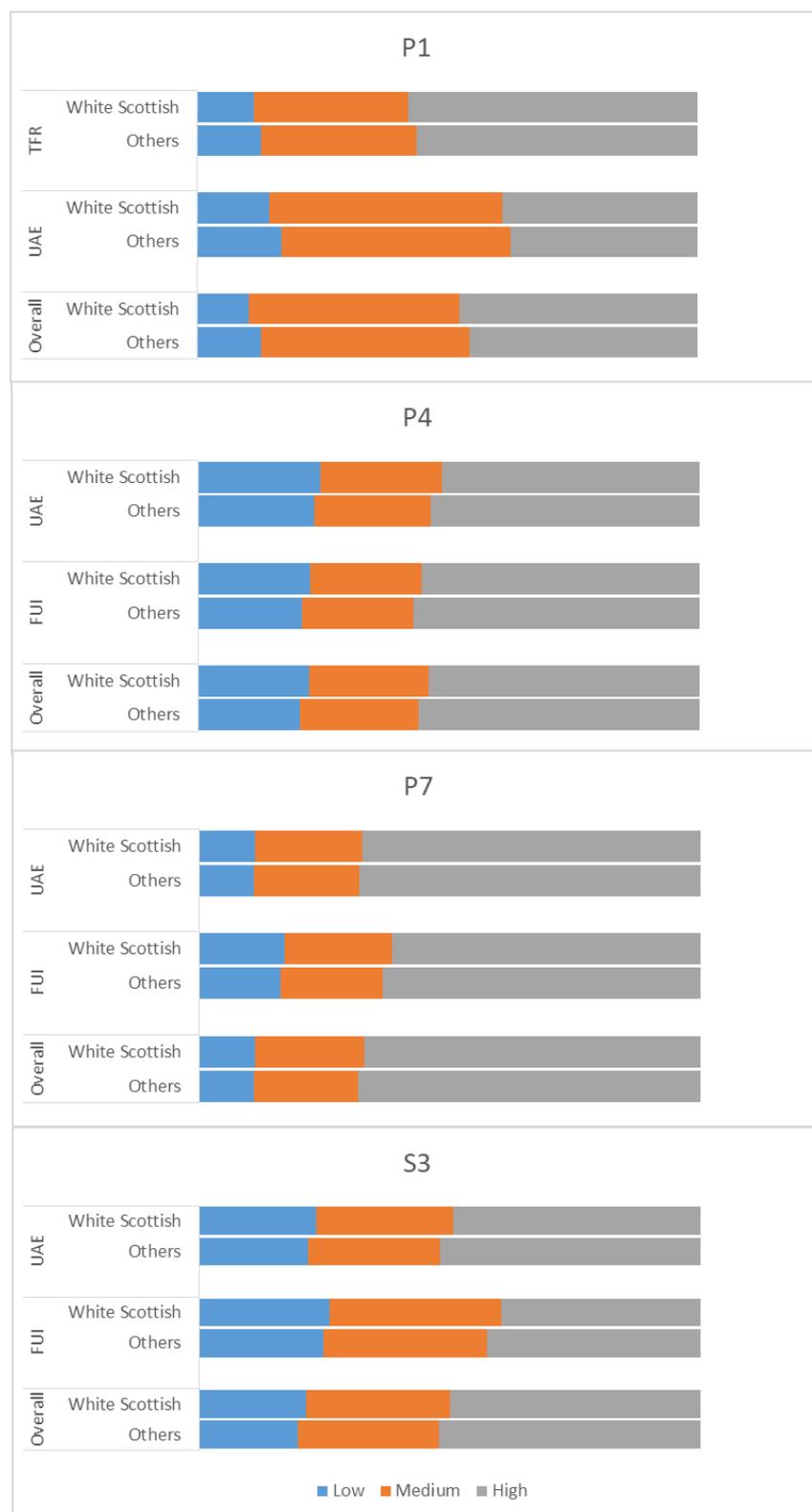
At P4 and P7, a similar picture emerged but there was a more marked difference in the distribution of results than for P1 between children in the bottom and top quintiles. More children from the bottom quintile showed capacity corresponding to the low capacity region, whereas larger numbers of children in the top quintile demonstrated a high capacity. Generally, less than half of learners from the bottom SIMD quintile showed high capacity in P4, compared with majorities among the learners in the top SIMD quintile. Both among P4 and P7 learners, the outcomes were in broadly similar proportions when considering assessment items related to each of the two organisers, Finding and using information and Understanding, analysing and evaluating.

At S3, there was also a relatively large difference in the distribution of results when comparing learners within the bottom and top quintiles of SIMD. There were notably higher proportions of learners from the bottom quintile with low capacity, and larger proportions of learners in the top quintile attaining a high capacity. The differences in the proportions of learners with high capacity among learners in the bottom and top quintiles of SIMD were somewhat larger for the organiser Understanding, analysing and evaluating than for the organiser Finding and using information.

### **3.3.4 Ethnic background**

This section looks at differences in reading capacity between learners with 'White Scottish' and other ethnic backgrounds. Chart 14 shows the reading/literacy results for these two groups.

Chart 14: Reading capacity distribution by Ethnic background and SNSA year

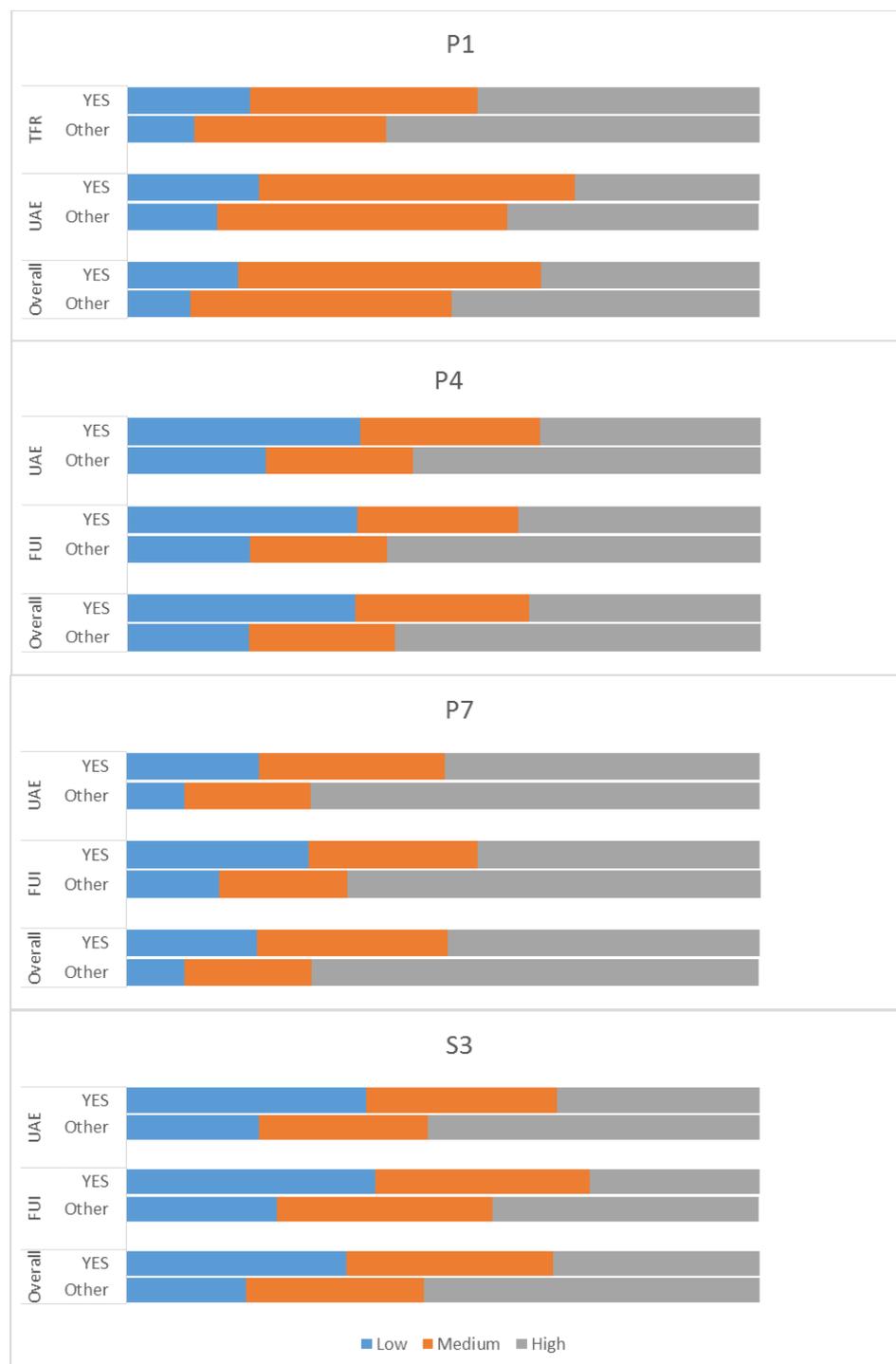


The results show that generally there were minor differences across the two comparison groups, both in terms of overall capacity and when considering results for each of the two organisers. The very small differences in proportions of children with high capacity across the two groups tended to be in favour of children from ‘White Scottish’ backgrounds at P1, and in favour of other ethnic backgrounds at P4, P7 and S3.

### 3.3.5 Free School Meal Registered

Chart 15 shows the reading/literacy capacity of learners according to groups defined by registration for free school meals. This chart distinguishes those with registered entitlement from all other learners.<sup>8</sup>

Chart 15: Reading capacity distribution by Free School Meal Registered and SNSA year



<sup>8</sup> The category 'Yes' refers to those learners whose record in SEEMiS, the national database, showed that they were registered for Free School Meals. The 'Other' category comprises both learners for whom there was a 'not registered' entry and those for whom there was no entry regarding free school meals.

At each of the four year groups, there were noticeably larger proportions in the high capacity group among learners without entitlement than among those with FSE, and correspondingly higher proportions in the low capacity group among learners with FSE. This pattern was similar across all year groups and also when considering results by organisers.

At P1, overall, about half of the children without FSE showed high capacity, while a minority of those with entitlement demonstrated capacity in this category. Differences were also similar when considering each of the two organisers Tools for reading and Understanding, analysing and evaluating.

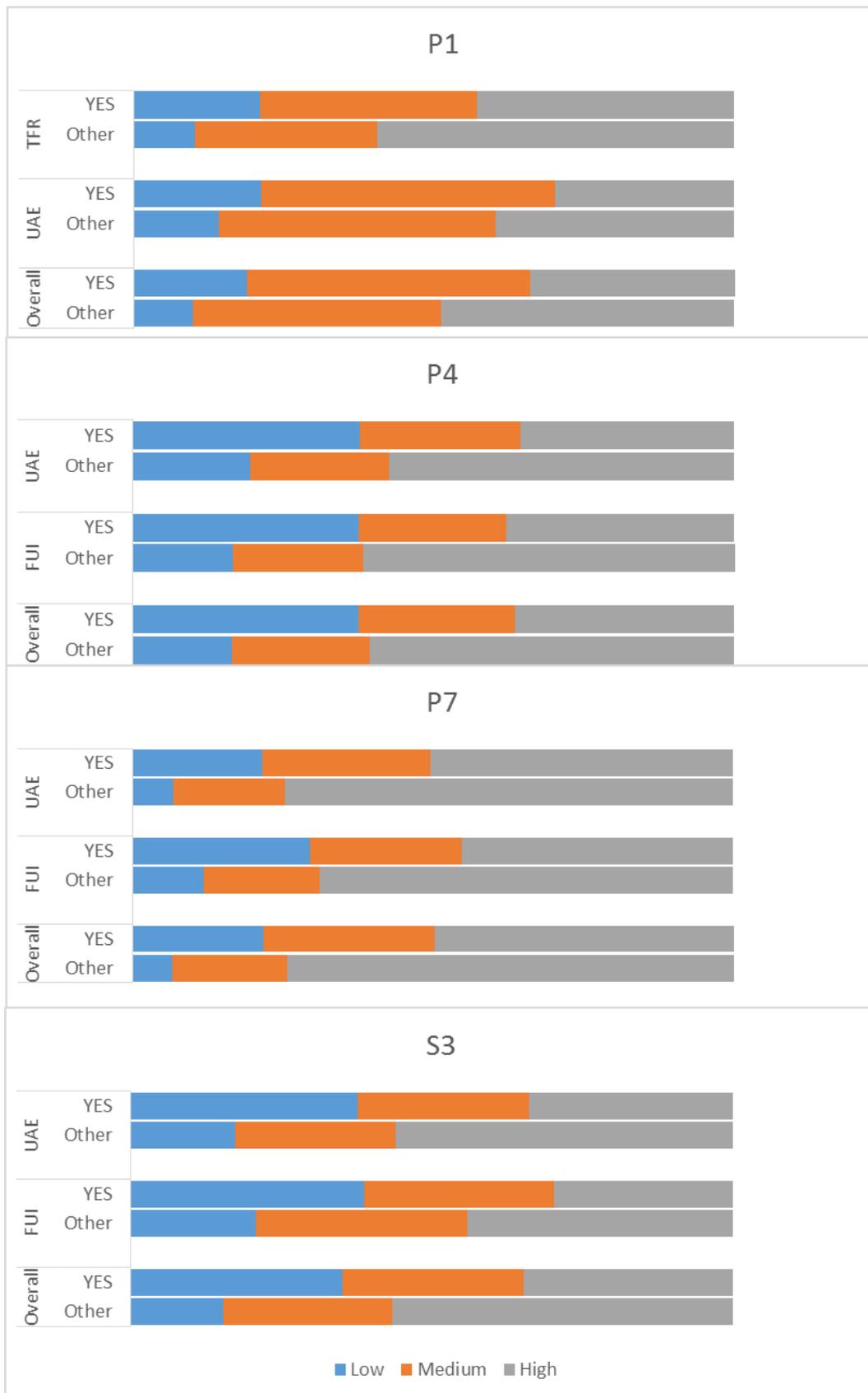
At P4 and P7, even larger differences between the two groups were observed, with similar differences in the proportions at high and low capacity when reviewing results by organisers.

Among learners at S3, the differences between those at high capacity, both with and without FSE, were somewhat smaller (but still notable) when considering only the organiser Finding and using information.

### **3.3.6 Additional Support Needs**

Chart 16 shows the proportions of learners with high, medium and low reading/literacy capacity across SNSA year groups, according to whether or not learners were identified as having Additional Support Needs (ASN).

Chart 16: Reading capacity distribution by ASN and SNSA year



Across all year groups, it can be seen that the proportions with higher capacity were notably larger among learners with no ASN, and similarly, there were larger proportions reflecting low capacity among learners with ASN. This pattern was present in all year groups.

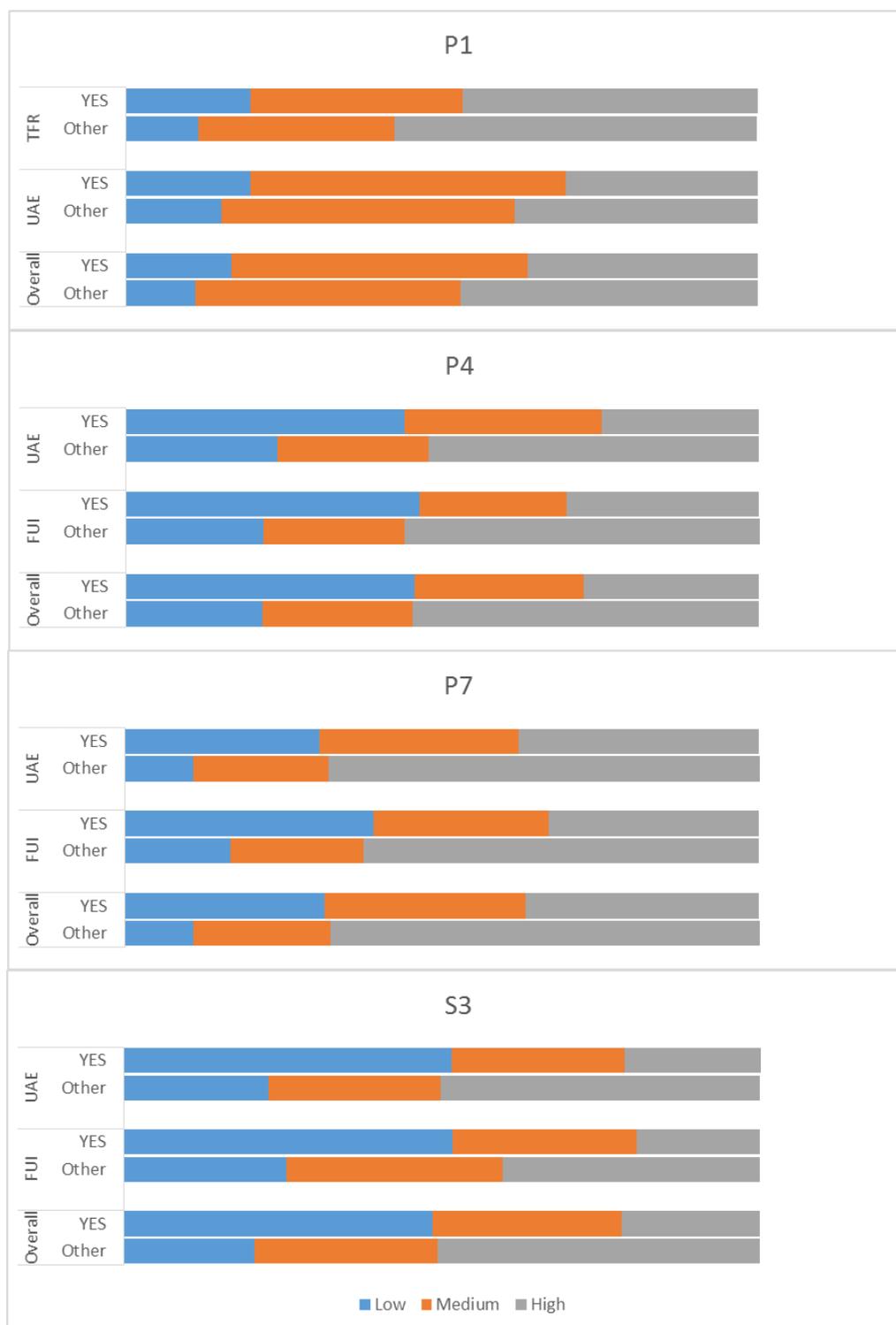
At P1, differences between the two groups were observable, but not as large as for other years. While, overall, about half of the learners without ASN showed high capacity, a minority of those with ASN fell into this category. The differences between the proportions with high capacity among the two groups were somewhat smaller with regard to the organiser Understanding, analysing and evaluating.

At P4 and P7, the majority of learners without ASN demonstrated high capacity, while only half or less than half of the learners with ASN had results corresponding to the high capacity range. This was the case with regard to their overall capacity and also when considering the two organisers separately. At S3, similar differences were found, although for the organiser Finding and using information the differences between groups were slightly smaller.

### **3.3.7 Looked After Children at Home and Looked After Children Away from Home**

Chart 17 shows the proportions of learners with high, medium and low capacity in reading/literacy by categories of Looked After Children at Home (LAH) and Looked After Children Away from Home (LAA), in comparison with other learners, as classified within SEEMiS.

Chart 17: Reading capacity distribution by LAH/LAA and SNSA year



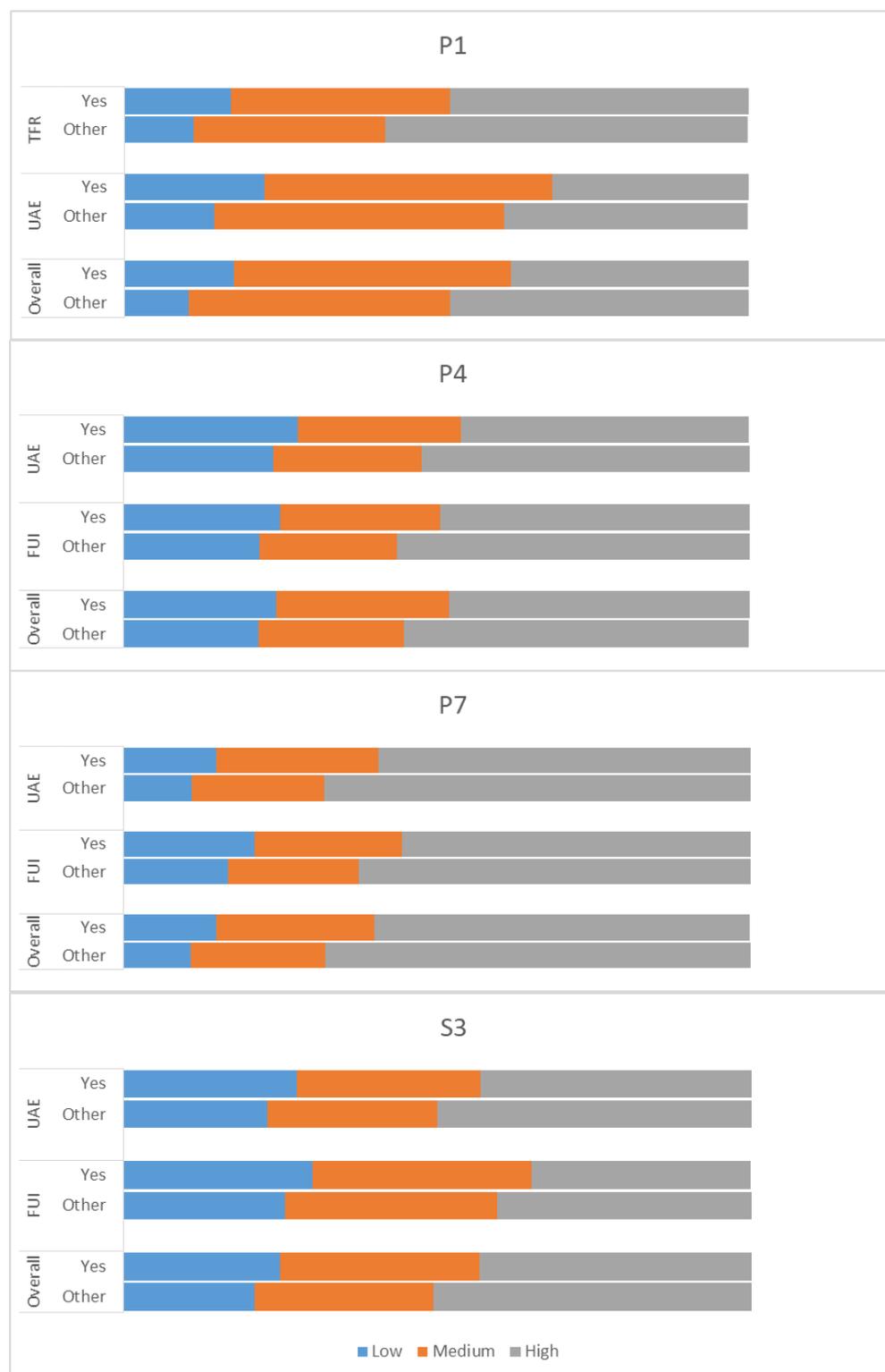
Across all four year groups, it can be seen that among those learners who are registered as LAH and LAA, there were notably lower proportions demonstrating high capacity, while among other learners there were larger proportions in this category. Similarly, among LAH and LAA learners, there were also higher proportions with low capacity, when compared with other learners. This pattern was similar across all four year groups.

At P1, differences among the two comparison groups were less pronounced than at higher year groups (P4, P7 and S3).

### **3.3.8 English as an Additional Language**

Chart 18 shows the reading/literacy capacity of learners according to groups defined by language background: English as an Additional Language (EAL) and all other children and young people. The category 'Yes' refers to those learners whose record in SEEMiS, the national database, showed that they had English as an additional language. The 'Other' category comprises both learners for whom there was a 'No' as the entry for EAL, and those for whom there was no entry in this field.

Chart 18: Reading capacity distribution by English as an Additional Language (EAL)



When comparing proportions of high, medium or low capacity between groups of learners for whom English is an additional language (EAL) and those with English as their first language, we observe in Chart 18 relatively small but notable differences in favour of learners in the latter group, both in terms of overall capacity and when considering individual organisers. Similar patterns were observed across all four year groups.

At P1, differences between the two groups were slightly larger than in higher years (P4, P7 and S3). When comparing proportions separately for the two organisers, similar differences between the two groups were observed, with learners with English as their first language showing somewhat larger proportions with high capacity.

## 4 Writing

### 4.1 The scope of the writing assessment

In the 2017 to 2018 academic year, Scottish National Standardised Assessments in writing were available for P4, P7 and S3. At P1, children were presented with a single assessment combining elements of reading and writing. This is referred to as the P1 literacy assessment. For more information on the P1 literacy assessment, please see Section 3: Reading/Literacy.

The assessments of writing were based on elements of Curriculum for Excellence (CfE), as articulated in the *Benchmarks: Literacy and English*, published as a draft in August 2016. It should be noted that for the 2018 to 2019 academic year, the final version of the *Benchmarks* (published in June 2017) is used as the reference point for the assessments.

### 4.2 Coverage of the Curriculum for Excellence: benchmarks and organisers

SNSA is just one part of the range of assessments that teachers use in making their evaluations of children's and young people's learning. As a standardised assessment to be completed within a limited time, using questions capable of being scored automatically, only some parts of the writing benchmarks could be addressed. It was agreed that the writing assessments should be based on the assessment organisers Spelling, Grammar and Punctuation, which all fall under the curriculum organiser Tools for writing. Each of the questions selected for inclusion in SNSA writing assessments for the 2017 to 2018 academic year was aligned with a benchmark statement from Tools for writing.

Spelling, Grammar and Punctuation were all substantially represented in the writing assessments for P4, P7 and S3, with Spelling having a slightly higher weighting in comparison with Grammar and Punctuation. This reflected the importance placed on this area of Tools for writing by the Scottish education experts involved in defining the basis of the assessment. The weighting across the three organisers for each year group in SNSA was roughly the same, and all three assessment organisers were addressed by at least five questions in the year group's full set, and in each learner's assessment, regardless of which path they took through the adaptive system. As such, in the school-level reports, teachers received information about the relationship between the learner's overall result and organiser level result for each of these areas at an individual learner level. In the rest of this section, features of the assessments of Spelling, Grammar and Punctuation for the three year groups are described, with examples of questions for illustration.

#### 4.2.1 Spelling

The writing assessment in the 2017 to 2018 academic year was designed to assess spelling words and strategies, covering the range of skills and the progression articulated in the *Benchmarks*. At the lower levels, learners were assessed on their ability to spell relatively simple and commonly used vocabulary. As the difficulty of the spelling questions increased, and in the higher stage assessments, children and young people were also asked questions to assess their knowledge of less familiar words. To answer the questions correctly, learners may have needed to rely on strategies, such as their knowledge of phonics, spelling patterns and rules, and at the highest level may have been asked to spell specialised vocabulary.

Throughout, spelling was assessed in context, using a range of formats. One format was the cloze style, in which learners had to select the correct spelling from a range of options, either in a single sentence or in a short passage. In a second question format, learners were

asked to type in the correct spelling of a given word, also in context. In a third format, learners had to identify the incorrectly spelt word in a sentence.

Figure 20 shows a typical Spelling question from the P4 writing assessment.

Which word in the following sentence has a spelling mistake?	
The class neaded a large sheet of plastic for the project.	
<input type="radio"/>	class
<input type="radio"/>	neaded
<input type="radio"/>	large
<input type="radio"/>	plastic
<input type="radio"/>	project

Figure 20: Example of a P4 Spelling item, 'Choose the incorrectly spelt word'

The question presented here required children to identify the incorrectly spelt word in a sentence, from a range of options. This question draws on the writing strategy of proofing and editing, which models for learners the importance of checking their writing to identify errors.

As can be seen in this P4 question, the context provided is a familiar classroom activity and all the words in the brief, grammatically simple sentence are common and relatively short. To answer this question correctly, the learner must know the correct spelling of the common word 'need', or know that the other options given are all spelt correctly. The incorrect options increase the difficulty of this item, as the third and fourth options include some slightly less familiar words ('plastic' and 'project'). This question was rated as having low difficulty in the 2017 to 2018 SNSA. It was presented to learners that had found the first phase of the assessment relatively challenging. A minority of these learners answered it correctly.

#### 4.2.2 Grammar

This organiser focuses on general grammar points, addressing the skills, knowledge and understanding articulated in the *Benchmarks*. At P4, for example, it assessed children's ability to link sentences using common conjunctions, such as 'and', 'because' or 'but', while at the higher stages, a fuller and more complex range of conjunctions was assessed. Questions addressing the Grammar organiser also assessed usage of prepositions, verb forms, adjectives and pronouns. At P4, the questions tended to relate to simple sentences. At P7 and S3, the challenge was increased by introducing longer, more complex language structures, such as compound sentences, conditionals and negative clauses; or by asking questions for which the child or young person needed to identify the relationship between two pronouns, where there was some ambiguity. In summary, as well as the grammar itself becoming more challenging, the contexts in which learners were asked to demonstrate their skills became more complex in the higher stage assessments.

Figure 21 presents an example of an S3 Grammar question, a typical example of the cloze (or gap fill) writing questions. As in the reading assessments, SNSA writing questions were often presented as ‘units’: a group of questions based on a single piece of stimulus. These units enabled more sustained context to be provided, and were used to assess all three writing assessment organisers. This stimulus text uses quite commonplace, simple vocabulary, but the sentence structures are relatively complex, allowing for a range of grammatical forms to be addressed.

Choose the best option for each blank space.

**Oh, Brother!**

It would have been easier if she had done it herself, but   1   she let her brother have a go.   2   the urge to tell him that he was messing things up.

  3   polite to say anything, she sat there   4   silence and bit her tongue.



Choose the best option for space 1.

instead

---

therefore

---

though

---

just

Figure 21: Example of an S3 writing unit with a Grammar question, ‘Oh Brother Question 1’

In this question, young people were asked to identify the correct adverb to fill the first space in the text, from a given range of options. Since all the options provided would be grammatical matches for the sentence and, apart from the last option (just), fit syntactically in the sentence, this question assesses the learners’ knowledge of the meaning of these cohesive devices and their correct application in context. This question was rated as having low difficulty in the S3 assessment. It was presented to learners who had found the first phase of the assessment relatively challenging. Most of these learners were able to answer this question correctly.

The question in Figure 22 is based on the same text as that in Figure 21, and asks about the second space in the given paragraph. In contrast to the first question, which requires an understanding of the meaning of the options presented, this second question clearly addresses knowledge of the correct lexical form, rather than meaning. Learners were asked to choose the participle required by the sentence structure.

Choose the best option for space 2.

resist

resisted

resisting

resistance

Figure 22: Example of an S3 writing unit with a Grammar question, 'Oh Brother Question 2'

This question was rated as having medium difficulty in the S3 writing assessment and was answered correctly by a majority of those learners to whom it was presented.

#### 4.2.3 Punctuation

The 2017 to 2018 SNSA assessed the organiser Punctuation in a variety of ways. These included asking learners to identify the location of a given punctuation mark, to choose between sentences to identify the correctly punctuated example, and to choose the missing punctuation in a sentence from a range of options.

In the P4 assessment, questions from this organiser focused mainly on the full stop, question mark and exclamation mark, and the correct use of capital letters. This punctuation was assessed in relatively simple sentences. At P7, the range of punctuation was extended to include commas, parentheses and the uses of inverted commas and punctuation within speech, in more complex sentences. At S3, colons and semi-colons were added to the range of punctuation marks addressed, and learners were asked to identify correct usage of punctuation marks in increasingly complex sentences.

As for the other writing organisers, questions targeting the Punctuation organiser were presented either using stand-alone sentences, or in units that used a passage of text with several questions attached to it.

Figure 23 presents an example of a P7 writing question from the Punctuation organiser. It is a typical example of a question in which children were asked to choose the sentence with the correct punctuation from a range of four or five options.

Which sentence has the correct punctuation?

"I like computer games Monika said especially when I win."

"I like computer games. Monika said, especially when I win."

"I like computer games," Monika said. "especially when I win."

"I like computer games," Monika said, "especially when I win."

Figure 23: Example of a P7 Punctuation question, 'Choose the sentence with the correct use of inverted commas'

In this question, children had to identify the correct punctuation, where a single sentence of direct speech is broken up by information about who is speaking. To answer this question correctly, learners had to work through several steps: first, to recognise that Monika is the speaker and not part of the quoted speech; second, identify that the second quoted phrase is a fragment that forms part of a single quoted sentence; and third, show their knowledge of how to use punctuation to link a single sentence broken up by the internal placement of the speaker. This question was answered correctly by a minority of those learners who encountered it. Of the incorrect answers, learners were more likely to select the third option than either of the first two, suggesting that while most learners may have recognised that Monika was the speaker, many of them were not able to correctly punctuate the split quoted sentence.

Figure 24 shows another example of a question from the Punctuation organiser. In this question type, young people were presented with a sentence and asked to identify the correct location of the missing punctuation: in this case, parentheses. The question is from the S3 writing assessment.

Which part of the following sentence should have parentheses ( ) around it?

**Donald Dewar 1937–2000 was the First Minister of Scotland from May 1999 until October 2000.**

1937–2000

First Minister

Scotland

from May 1999 until October 2000

Figure 24: Example of an S3 Punctuation question, 'Identify the location of parentheses'

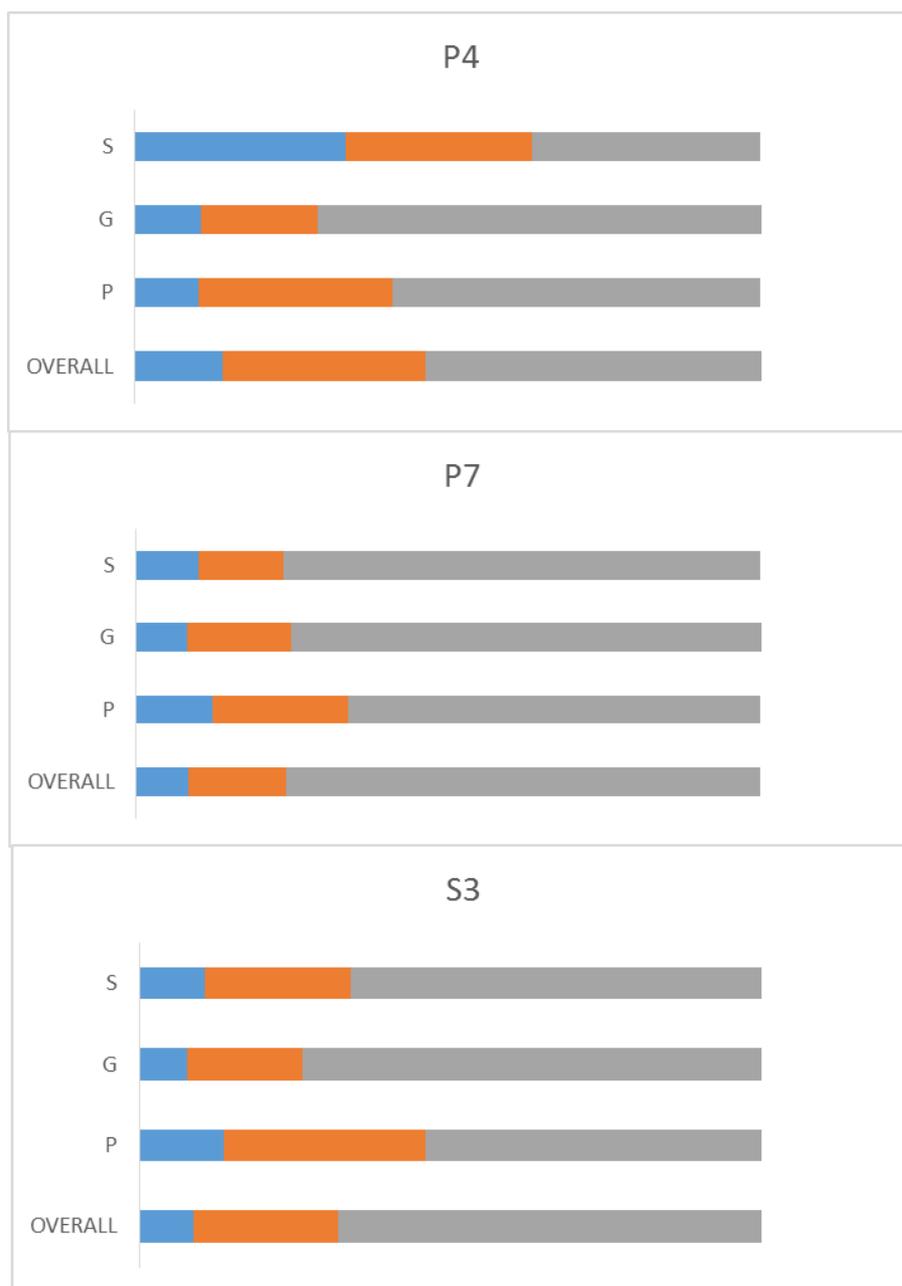
In this question, a relatively simple sentence uses the context of Scottish history. To answer this question correctly, young people had to identify that lifespan numerals should be put in parentheses. Of the incorrect answers, young people were most likely to select the fourth option. While these learners may have correctly identified that this phrase was not grammatically required by the sentence, they did not recognise the need for parentheses around the lifespan. This question was rated as having low difficulty. It was presented to learners who had found the first two phases of the assessment challenging. Among learners who encountered it, this question was answered correctly by a minority.

### 4.3 National results for writing

#### 4.3.1 Overall capacity

Chart 19 shows the overall capacity for writing across all three year groups (P4, P7, and S3), both overall and when considering each of the three organisers Spelling (S), Grammar (G) and Punctuation (P). Regions show high, medium and low capacity, in line with SNSA reports for the 2017 to 2018 academic year, which are specific to each year group.

Chart 19: Writing Capacity by SNSA year



The chart shows that, with the exception of the results for the organiser Spelling in P4, across all three year groups the greatest proportion of learners tended to be found in the high capacity group, with the second-highest proportion in the medium capacity group. Few learners were observed in the low capacity group.

At P4, a majority of the learners demonstrated high capacity overall and for the Grammar and Punctuation organisers, while smaller proportions of learners showed low and medium capacity. When considering only Spelling, less than half of the learners demonstrated high capacity and a relatively large proportion of learners fell within the low capacity region.

Most learners at P7 demonstrated high capacity on their writing assessment, while only relatively small proportions demonstrated low capacity. There were somewhat smaller proportions of learners with high capacity when considering only the Punctuation organiser, as compared with Spelling and Grammar.

At S3, overall and for the three organisers individually, a majority of learners demonstrated high capacity, while only a few fell into the low capacity ranges. Among the organisers, the proportion of young people in the high capacity region was most pronounced for Grammar, with Punctuation showing a notably lower proportion at high capacity (although, still more than half fell into this category).

Given that learners tend to advance in their learning throughout the school year, but also at a different pace at different stages of schooling, we compared the results from the two SNSA norming studies<sup>9</sup> carried out in Scotland during the 2017 to 2018 academic year, to review the differences in learning between the first and second halves of the year with regard to writing capacity acquisition among Scottish learners.

Chart 20: Writing capacity across norming study time periods

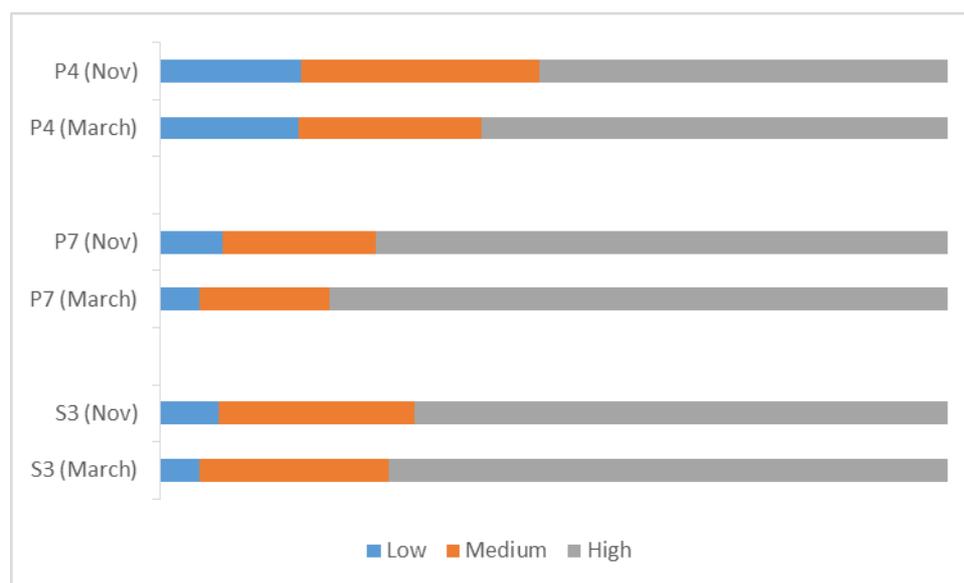


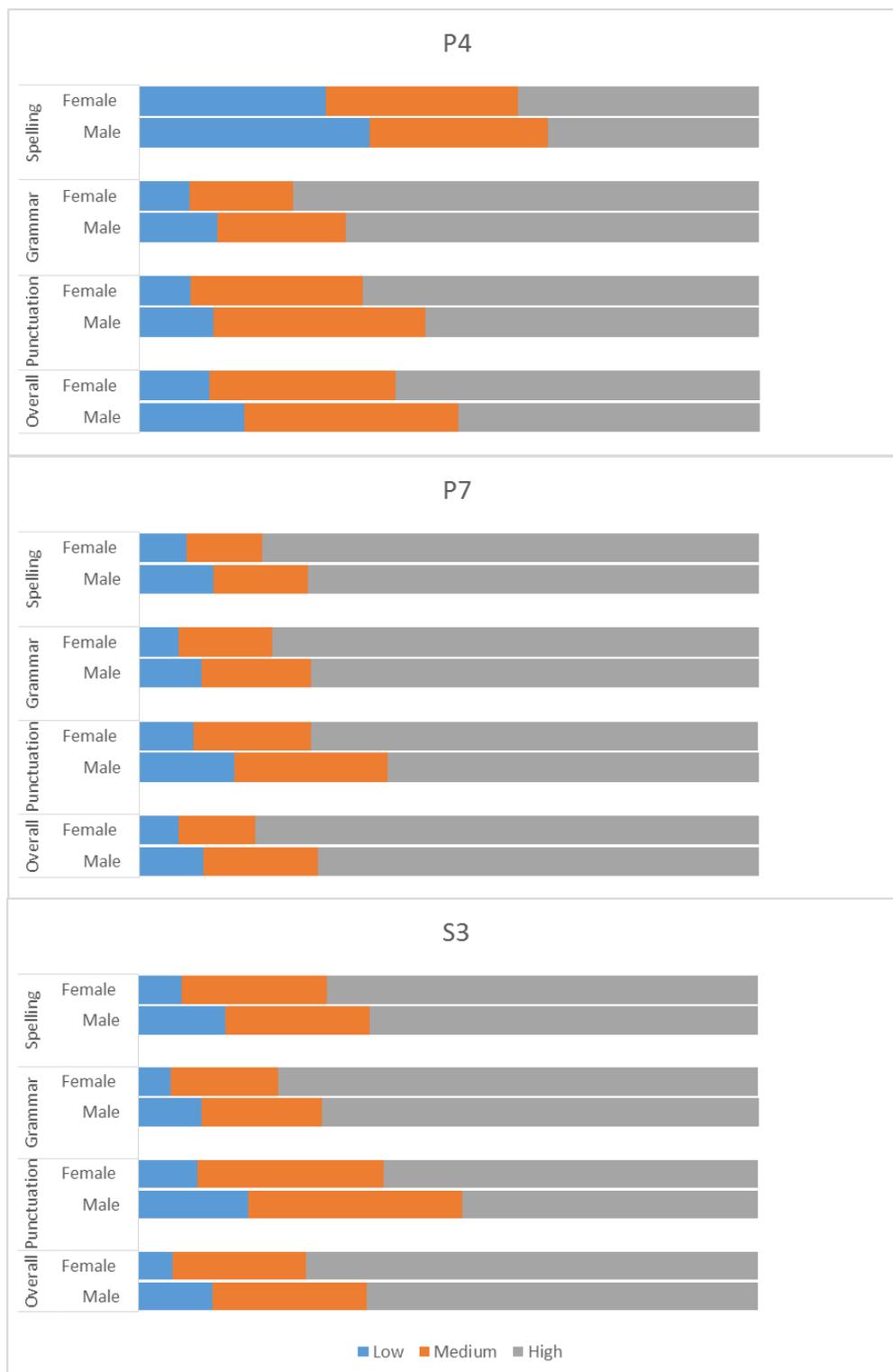
Chart 20 shows that between November and March, among learners assessed in the second norming study, at all three year groups, there were larger proportions with high capacity than among those assessed in the first norming study. Likewise, there were decreases in the proportion of learners with low capacity across the two norming studies in P7 and S3, but not at P4. The differences in the proportions of learners with high capacity between the two norming studies were relatively largest at P4 and smallest at S3.

#### 4.3.2 Gender

Chart 21 shows the proportions of writing capacity among boys and girls for all three SNSA year groups, overall, and when considering each of the three organisers.

<sup>9</sup> Results from the norming studies were used for the purpose of providing representative sample survey data, collected at clearly defined assessment periods during the school year.

Chart 21: Writing capacity distribution by gender and SNSA year



For all year groups, the largest proportions of learners were found within the high capacity range, both overall and when considering each of the organisers separately. The only exception was the distributions for Spelling at P4. However, there were notable differences between the two gender groups, with consistently larger proportions of girls in the high capacity category, as compared with boys, and correspondingly smaller proportions of girls than boys in the low capacity region.

At P4, while a majority of girls attained an overall capacity in the high region, slightly less than half of boys fell into the same category. Similar differences between the two gender groups were observed when considering the three organisers separately, with the largest difference between proportions of high capacity learners in favour of girls recorded for Punctuation.

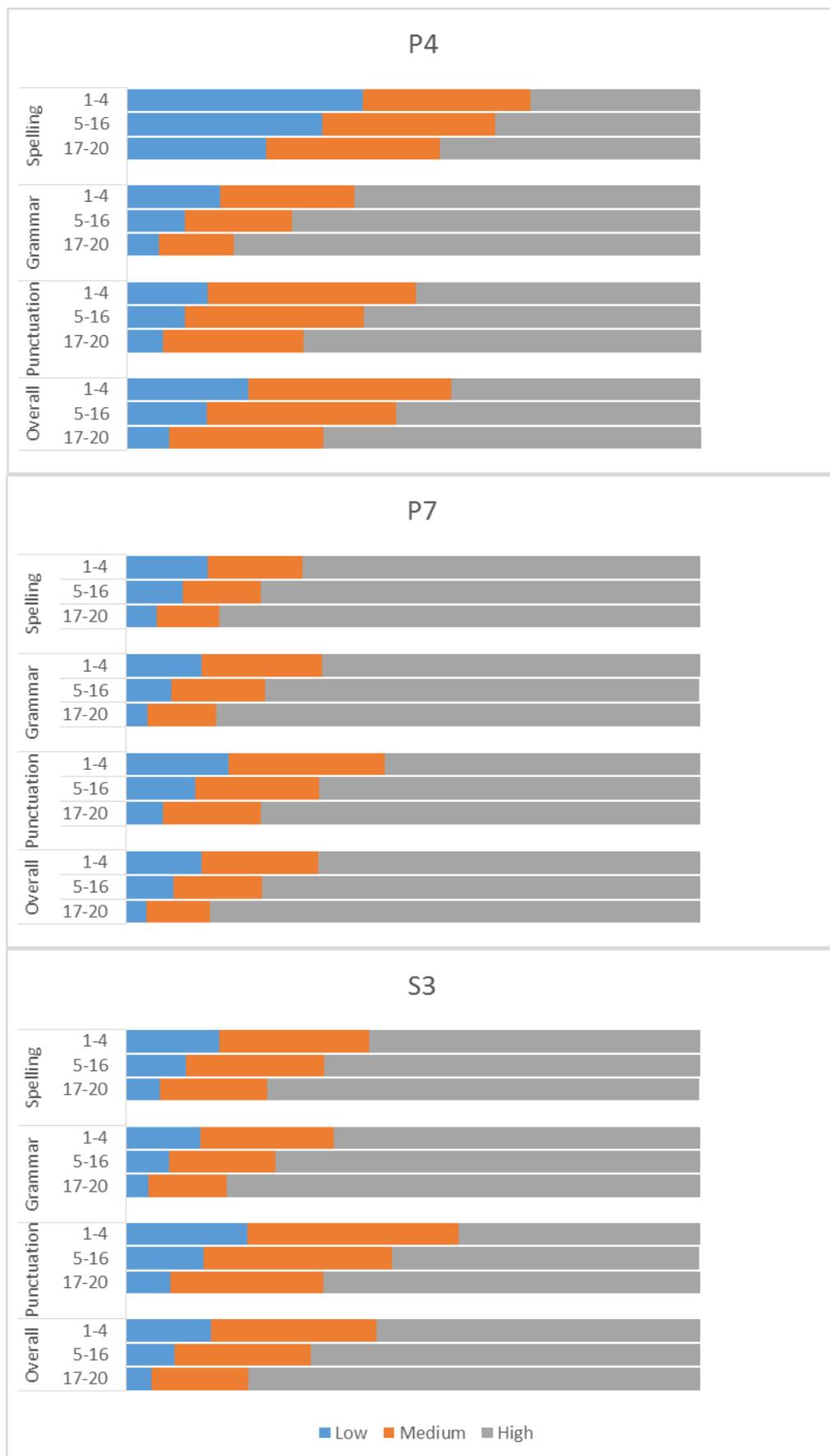
At P7, while in both gender groups most learners demonstrated high capacity, we observed notably higher proportions among girls than among boys. This finding holds overall and when considering the three organisers separately. Again, the largest differences between proportions with high capacity in favour of girls were observed for Punctuation.

At S3, in addition to the tendencies described for other year groups, there was a notably higher proportion of boys as compared with girls demonstrating low writing capacity overall. This difference was more substantial when only considering Punctuation, and the proportion of girls in the high capacity category for this organiser was notably larger than the proportion of boys.

#### **4.3.3 Scottish Index of Multiple Deprivation**

This section reviews the distribution of learners for all SNSA year groups across categories reflecting the Scottish Index of Multiple Deprivation (SIMD). To simplify the display of results and aid their interpretation, we used three categories to indicate levels of socioeconomic background, namely: 1–4, indicating the bottom socioeconomic quintile (that is, the most deprived children and young people, those in vigintiles 1 to 4); 5–16, indicating the three middle quintiles (that is, those in vigintiles 5 to 16); and 17–20, indicating the top quintile (that is, the least deprived children and young people, those in vigintiles 17 to 20).

Chart 22: Writing capacity distribution by SIMD and SNSA year



At each year group, it can be seen in Chart 22 that the proportions of learners in the group with high capacity was noticeably larger in the SIMD category which reflects a higher socioeconomic status (that is, less deprivation), while relatively larger proportions of learners with low capacity were observed in the SIMD category which reflects lower socioeconomic status. This pattern was present in all three year groups, overall and when considering only assessment items corresponding to each of the three writing organisers Spelling, Grammar and Punctuation.

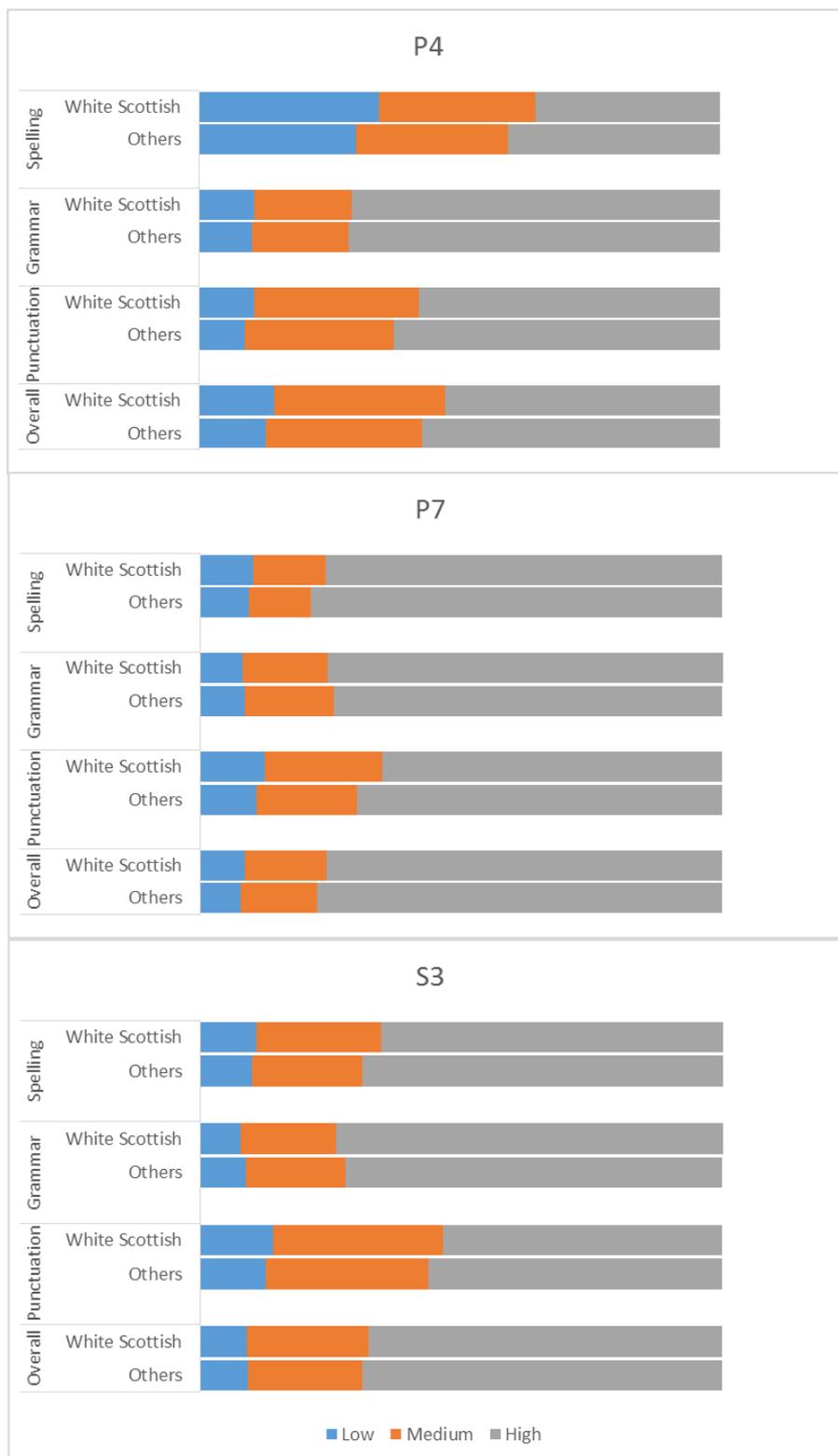
The results illustrate that the differences in writing capacity between children from the bottom quintile and the top quintile of SIMD were similar across all three year groups (P4, P7 and S3). More children from the bottom quintile showed capacity corresponding to the low capacity region, whereas larger numbers of children in the top quintile demonstrated a high capacity. In P4, less than half of learners from the bottom SIMD quintile showed overall high capacity, while a majority of learners in the top SIMD quintile fell into the high capacity category. For the organiser Spelling, while less than half of learners across all SIMD groups demonstrated high capacity, there were marked differences between the lowest and highest quintile, in favour of the latter.

Among both P7 and S3 learners, the majority across all SIMD groups tended to demonstrate high capacity, but among those from the top quintile, there were much larger proportions of learners with high capacity than for the bottom quintile. With regard to Punctuation, a majority of S3 learners in the top SIMD quintile showed high capacity, while this was the case for less than half in the bottom SIMD quintile.

#### **4.3.4 Ethnic background**

This section looks at differences in writing capacity between learners with 'White Scottish' and other ethnic backgrounds. Chart 23 shows the reading/literacy results for these two groups.

Chart 23: Writing capacity distribution by Ethnic background and SNSA year



When comparing writing capacity across groups of learners with ‘White Scottish’ and other ethnic backgrounds, we found relatively small differences, both in terms of overall capacity and when considering results for each of the three organisers (Chart 23). The results show that slightly lower proportions of learners from a ‘White Scottish’ background demonstrated writing capacity in the high category, as compared with those from other ethnic

backgrounds. However, at P7 and S3, in relation to Grammar, among learners from a 'White Scottish' background, there were slightly larger proportions with high capacity as compared with other groups.

#### **4.3.5 Free School Meal Registered**

Chart 24 shows the writing capacity of learners according to groups defined by registration for free school meals. This chart distinguishes those with registered entitlement from all other learners.<sup>10</sup>

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<sup>10</sup> The category 'Yes' refers to those learners whose record in SEEMiS, the national database, showed that they were registered for Free School Meals. The 'Other' category comprises both learners for whom there was a 'not registered' entry, and those for whom there was no entry regarding free school meals.

Chart 24: Writing capacity distribution by Free School Meal Registered and SNSA year

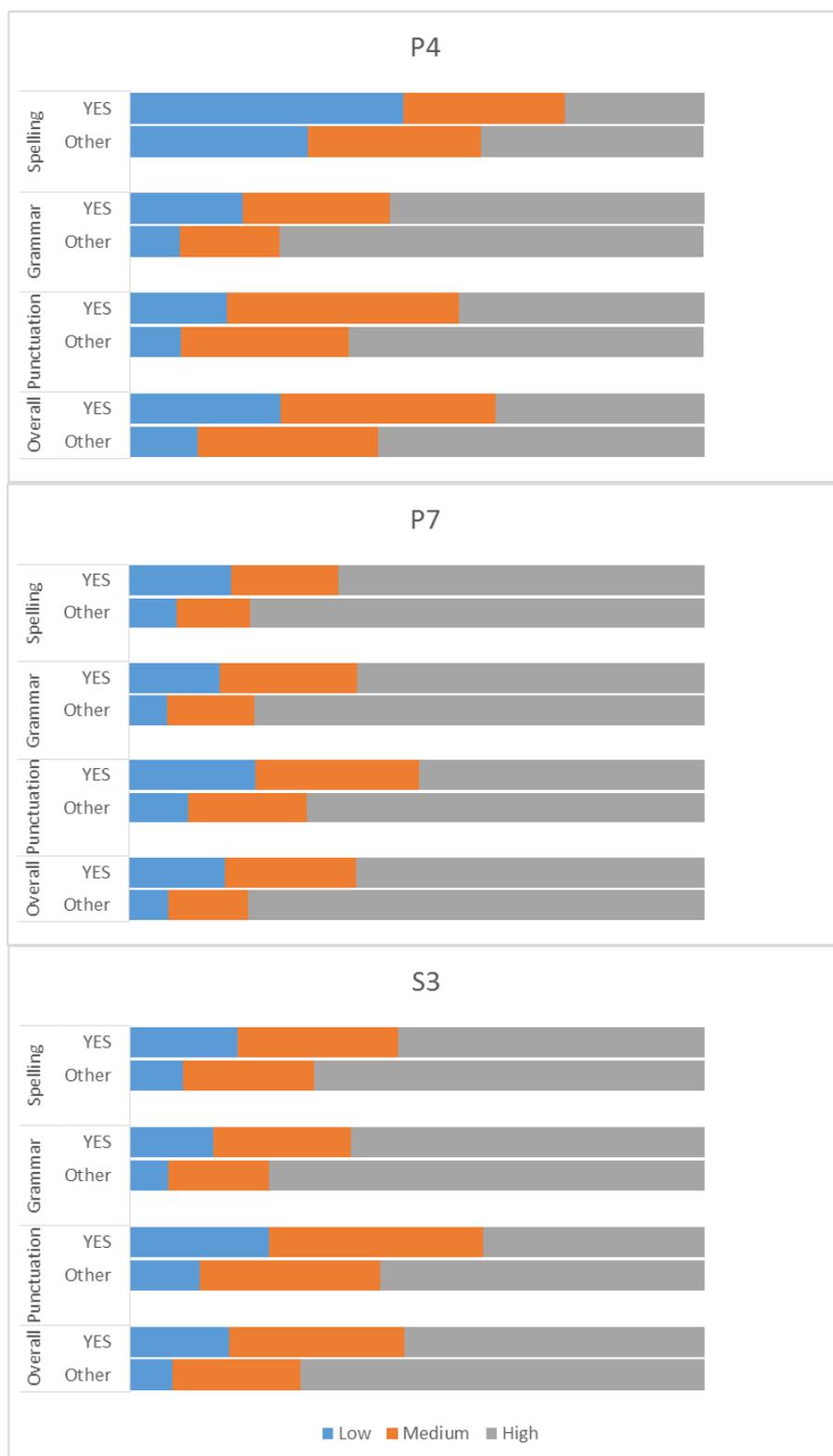


Chart 24 shows that at each of the three year groups there were notably larger proportions in the high capacity group among learners without entitlement than among those with FSE, and correspondingly higher proportions in the low capacity group among learners with FSE. This pattern was similar across all year groups and also when considering results by each of the three organisers.

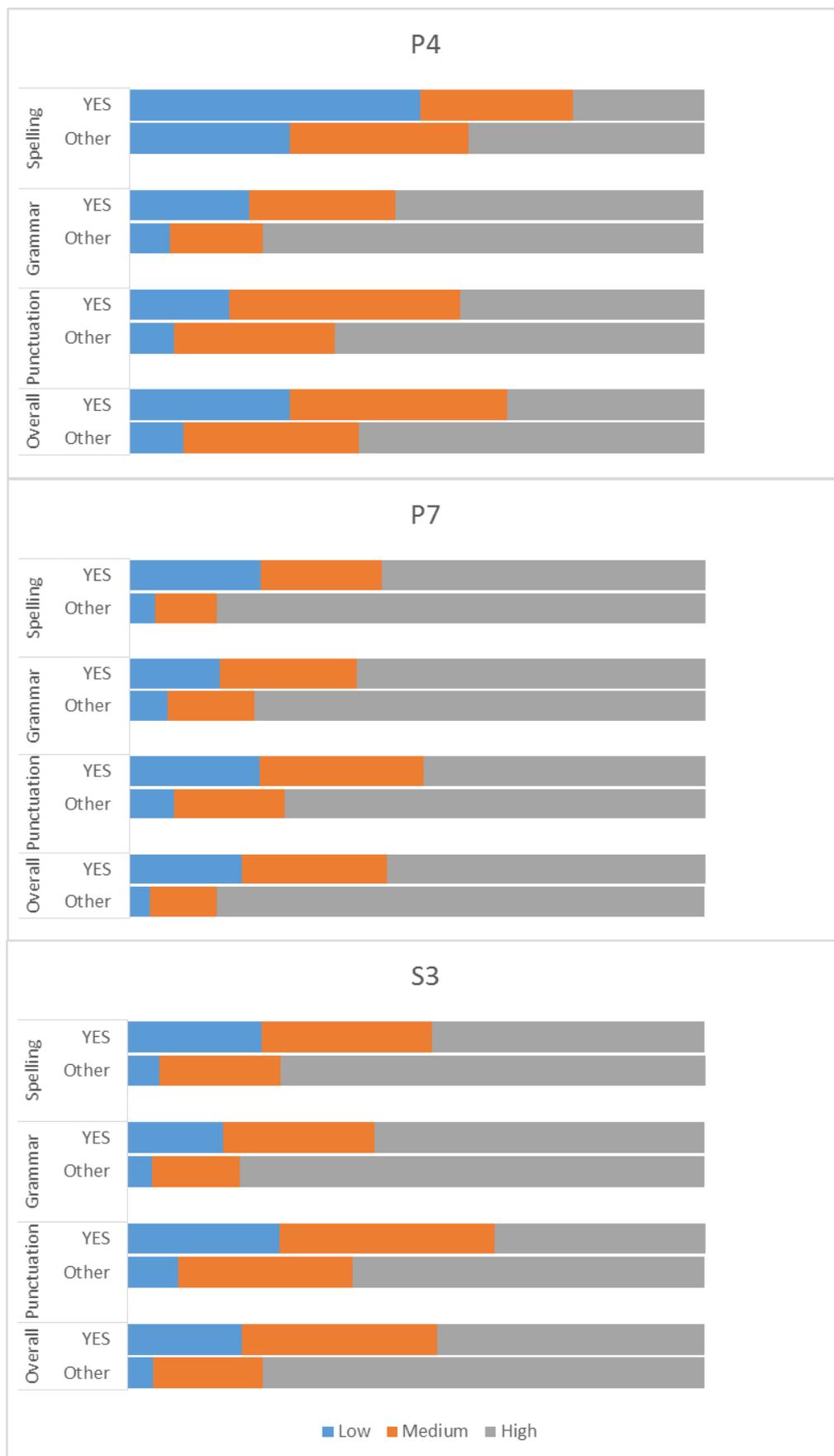
At P4, while overall a majority of the children without FSE showed high capacity, only a minority of those with entitlement demonstrated capacity in this category. Differences were similar also when considering each of the three organisers separately, noting that for Spelling, in both groups, only a minority demonstrated high capacity.

At P7, the majority of learners in both groups demonstrated high capacity, overall and for each of the three organisers. However, we observed marked differences in favour of learners without FSE. Among learners at S3, differences between the proportions of learners with high capacity across the two groups were also similar. When considering only Punctuation, a minority of learners with FSE demonstrated high capacity compared to more than half of the learners without FSE.

#### **4.3.6 Additional Support Needs**

Chart 25 shows the proportions of learners with high, medium and low writing capacity across SNSA year groups, according to whether or not learners were identified as having Additional Support Needs (ASN).

Chart 25: Writing capacity distribution by ASN and SNSA year



Across all year groups, it can be seen that the proportions with high writing capacity were notably larger among learners with no registered ASN, while there were larger proportions reflecting low capacity among learners with ASN. This pattern is present in all year groups, both overall and for each of the three writing organisers.

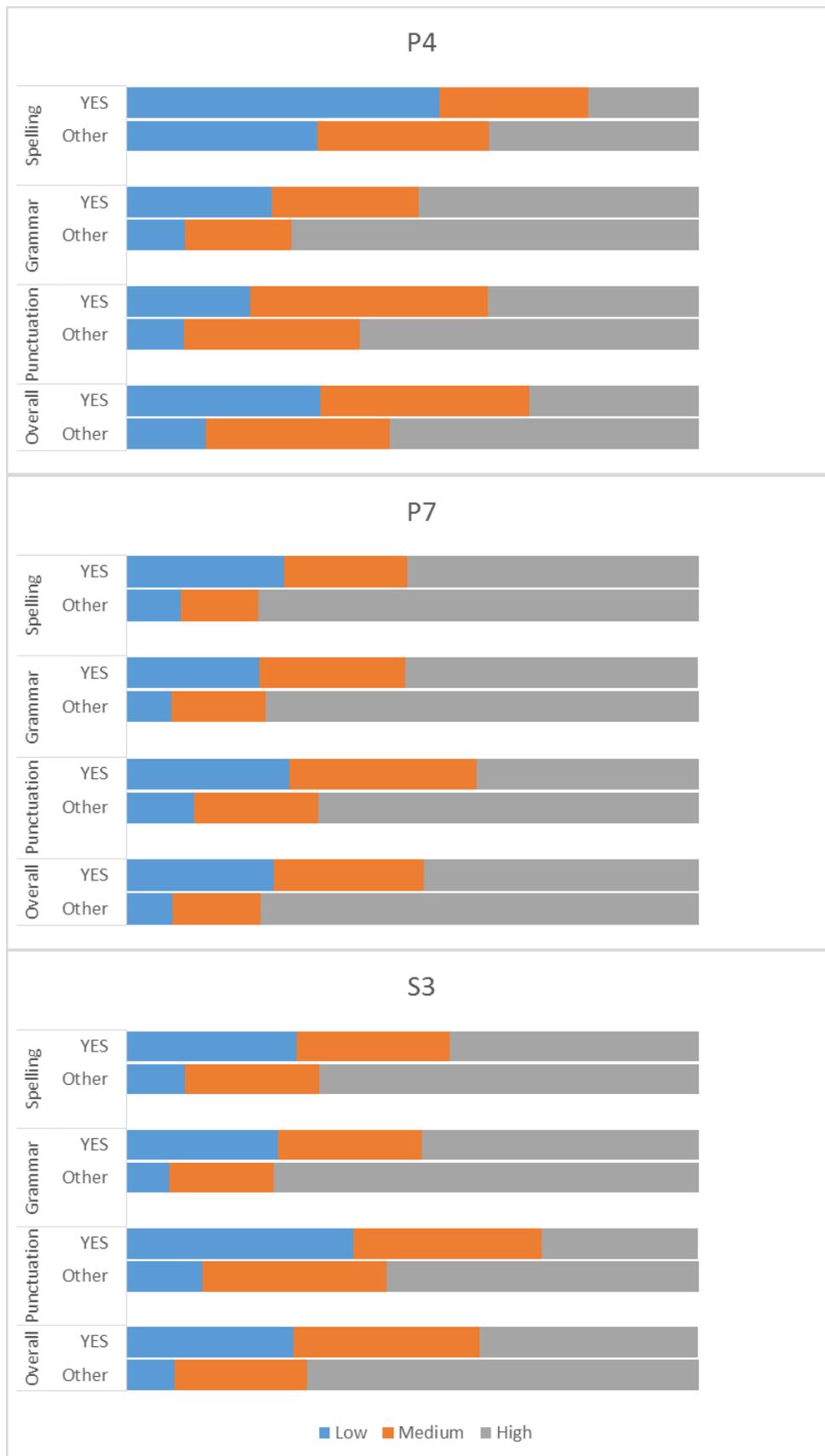
At P4, a majority of learners without ASN had results corresponding to the high capacity range overall, while among learners with registered ASN, only a minority showed high capacity. When considering only Spelling, in both groups, less than half showed high capacity but the proportion of learners with registered ASN was noticeably larger in this category as compared with learners without ASN. Additionally, about half of learners with ASN demonstrated low capacity with regard to this organiser.

At P7, half or more among learners in both groups tended to show high capacity overall. However, there were marked differences in favour of those without registered ASN. Differences in the proportions of learners with high capacity were largest with regard to Spelling. At S3, similar differences were found between the two comparison groups. When considering only Punctuation, less than half of the learners with registered ASN showed high capacity, while a majority among those without ASN had results in this capacity range.

#### **4.3.7 Looked After Children at Home and Looked After Children Away from Home**

Chart 26 shows the proportions of learners with high, medium and low capacity in writing by categories of Looked After Children at Home (LAH) and Looked After Children Away from Home (LAA), in comparison with other learners, as classified within SEEMiS.

Chart 26 Writing capacity distribution by LAH/LAA and SNSA year



Across all three year groups, we found notably lower proportions demonstrating high capacity among those learners with LAH and LAA, while among other learners, there were

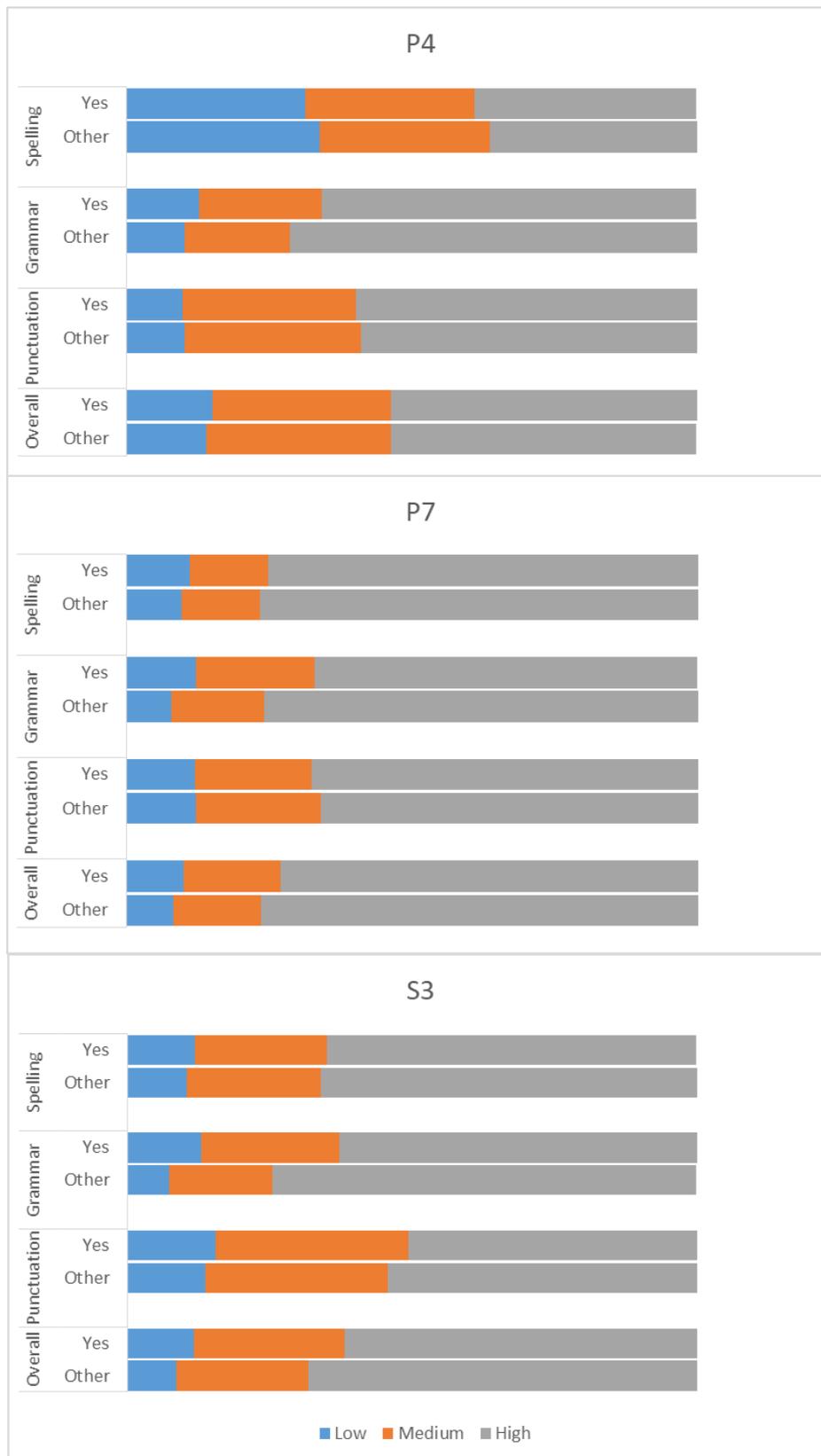
larger proportions demonstrating high capacity. Similarly, among learners with LAH and LAA, there were also larger proportions with low capacity than was the case among other learners. This pattern was similar across all four year groups.

At P4, a majority among learners registered with LAH or LAA showed low capacity, with respect to Spelling, compared to less than half among other learners. Both at P7 and S3, less than half of learners with LAH and LAA demonstrated high capacity, with respect to Punctuation, while a majority of other learners fell within the high category for this organiser. At S3, this difference also held with regard to overall writing capacity for both groups.

#### **4.3.8 English as an Additional Language**

Chart 27 shows the writing capacity of learners according to groups defined by language background: English as an Additional Language (EAL) and all other children and young people. The category 'Yes' refers to those learners whose record in SEEMiS, the national database, showed that they had English as an additional language. The 'Other' category comprises both learners for whom there was a 'No' as the entry for EAL, and those for whom there was no entry in this field.

Chart 27: Writing capacity distribution by English as an Additional Language (EAL)



As Chart 27 shows, when comparing proportions of high, medium or low capacity between groups of learners for whom English is an additional language (EAL) and those with English as their first language, we observed no difference at P4, and only relatively small differences

in favour of learners in the latter group at P7 and S3. Differences in favour of learners with English as their first language were larger when considering only Grammar. Similar patterns were observed across all three year groups.

Differences between the two groups with regard to Grammar were slightly larger at the higher year groups, and were largest at S3. However, at both P7 and S3, in relation to Spelling, there were only very small differences in favour of learners with English as their first language.

## 5 Forward look: national reporting for 2018 to 2019 academic year

This national report on performance of learners on the 2017 to 2018 academic year assessments has been based upon discrete scales for each year group, which all used the broad categorisation of capacity as high, medium or low. This approach was unique to the first year of presentation of the SNSA. Norming studies and a long scale equating study, completed during 2017 to 2018, have enabled a more refined scale for each subject area to be developed. In reporting for 2017 to 2018, a large proportion of children and young people showed capacity in the region labelled 'high'. For the 2018 to 2019 academic year assessments, and in subsequent years, results are described along a series of bands, with reference to the SNSA long scale for each subject. During the course of the 2018 to 2019 academic year, the previous year's results will be transposed onto the long scale and retrospectively reported on the long scale, at school and local authority level. With the more refined long scale in place, the national report for future years will be able to comment on the proportion of learners demonstrating capacity for each of the capacity bands, according to the different organisers and learner characteristics included in this report.

With regard to the capacity regions for 2017 to 2018, it is important to note that each of the descriptors is specific to the P1, P4, P7 and S3 assessments, which means that regions are not comparable across year groups. Therefore, differences in proportions across year groups do not reflect growth in capacity. For the 2018 to 2019 academic year, the newly established bands corresponding to the SNSA long scale will allow comparisons between year groups, in terms of proportions of learners demonstrating capacity at each band.

## 6 Appendices

### 6.1 Appendix 1: Assessments completed during the 2017 to 2018 academic year

The 2017 to 2018 academic year was the first year of implementation for the SNSA. In total, 579,879 assessments were completed across Scotland over the course of the year – about 95% of the possible maximum total of assessments available for children and young people in P1, P4, P7 and S3<sup>11</sup>. Table 2 shows this total, split by assessment.

Table 2: SNSA 2017 to 2018 completion rates by assessment

<b>Assessment</b>	<b>Assessments completed</b>	<b>Number of learners enrolled</b>	<b>Percentage completed</b>
Primary 1 Numeracy 2017–18	55,016	57,332	96%
Primary 1 Literacy 2017–18	54,723	57,332	95%
Primary 4 Numeracy 2017–18	56,502	58,299	97%
Primary 4 Reading 2017–18	56,338	58,299	97%
Primary 4 Writing Skills 2017–18	56,451	58,299	97%
Primary 7 Numeracy 2017–18	53,681	55,718	96%
Primary 7 Reading 2017–18	53,561	55,718	96%
Primary 7 Writing Skills 2017–18	53,351	55,718	96%
Secondary 3 Numeracy 2017–18	46,842	51,857	90%
Secondary 3 Reading 2017–18	46,863	51,857	90%
Secondary 3 Writing Skills 2017–18	46,551	51,857	90%
<b>Total</b>	<b>579,879</b>	<b>612,286</b>	<b>95%</b>

<sup>11</sup> Note that this figure and those quoted in the table below include out-of-stage assessments.

## 6.2 Appendix 2: Timing of assessments and factors influencing attainment

SNSA are designed to allow children and young people to be assessed at any time in the school year that is deemed suitable for the school, class and individual learner. A consequence of the flexible timing is that, when interpreting the results of the assessment at individual, class, school or local authority level, the time in the school year that the assessment was done needs to be taken into account.

There is clear evidence from the norming studies conducted during the course of the 2017 to 2018 academic year, in November and March, and from the whole year's attainment levels per stage, that children's and young people's capacity, on average, develops progressively in their literacy and numeracy skills, knowledge and understanding, as measured by SNSA, over the 10 (effective) months of an academic year. Amongst the year groups presenting for SNSA, children in Primary 1 showed a marked increase in capacity in both literacy and numeracy when comparing results from 2017 (August to December) with those from 2018 (January onwards). The same pattern was observed for Primary 4, Primary 7 and Secondary 3, across all subject areas, but with diminishing increases in performance in 2018, for each successive year group. Within each year group, the rate of improvement between the first half and second half of the 2017 to 2018 academic year was similar, regardless of subject area. The only exception to this general pattern of improvement from 2017 to 2018 was for S3 reading, where the overall result was the same.

While the findings described above might be as expected, they are also reassuring, in that they appear to demonstrate empirically that, overall, children's and young people's literacy and numeracy do progress over the course of a school year. However, given the possibility of administering SNSA at any time during the school year, results from all learners should be interpreted with some caution when making any comparative judgements about individuals or groups. Sections 2, 3 and 4 include details of the changes in performance evidenced by the two norming studies. However, for ease of understanding, reporting on performance by organisers and learner characteristics, which is displayed later in each subject-area section, draws on data from the whole year. As such, when reviewing the information in these latter parts of each section, consideration should be given to the information that the norming studies provide regarding changes in performance between the first and second halves of the year.

### 6.3 Appendix 3: Composition of the SNSA assessment instruments

The tables in this appendix provide details of the allocation of items to each organiser within the assessments for the 2017 to 2018 academic year. Additionally, Table 3 shows the number of items presented to each learner, in relation to the total number of items available within the adaptive model for the assessment.

In each assessment, in each year group, all of the available organisers were represented. However, there were different proportions across the year groups. In the school-level reports, teachers received information about the relationship between the learner's overall result and their result at organiser level. This was provided at the individual learner level for each organiser that was addressed by at least five questions in the learner's adaptive assessment. Organisers addressed by at least five questions in the year group's full set have been reported on as a group in this national report. Where there were fewer than five items allocated to an organiser within an assessment, results are not reported, since outcomes are not considered sufficiently reliable to be used in reporting overall national performance on the organiser.

Table 3: SNSA 2017 to 2018 number of items per learner and assessment

Year Group	Learning Area	Total scored items per learner assessment	Total number of scored items in assessment
P1	numeracy	30	60
P1	literacy	30	70
P4	numeracy	30	70
P4	reading	30	70
P4	writing skills	30	70
P7	numeracy	33	76
P7	reading	33	71
P7	writing skills	33	77
S3	numeracy	36	84
S3	reading	34	78
S3	writing skills	36	84

Table 4: SNSA 2017 to 2018 number of numeracy items by organiser

<b>Organiser</b>	<b>P1</b>	<b>P4</b>	<b>P7</b>	<b>S3</b>
Number	25	28	30	25
Fractions, decimals and percentages	6	11	12	17
Measurement, time and money	22	20	23	25
Information handling	7	11	11	17
<b>Total</b>	<b>60</b>	<b>70</b>	<b>76</b>	<b>84</b>

Table 5: SNSA 2017 to 2018 number of reading items by organiser (including P1 literacy)

<b>Organiser</b>	<b>P1</b>	<b>P4</b>	<b>P7</b>	<b>S3</b>
Tools for reading	40	3	3	1
Finding and using information	2	33	24	21
Understanding, analysing and evaluating	28	34	44	56
<b>Total</b>	<b>70</b>	<b>70</b>	<b>71</b>	<b>78</b>

Table 6: SNSA 2017 to 2018 number of writing items by organiser

<b>Organiser</b>	<b>P4</b>	<b>P7</b>	<b>S3</b>
Spelling	29	31	33
Grammar	20	23	25
Punctuation	21	23	26
<b>Total</b>	<b>70</b>	<b>77</b>	<b>84</b>

## 6.4 Appendix 4: Quality assurance

In preparation for first presentation of the assessments in the 2017 to 2018 academic year, quality assurance activities took place both in relation to the proposed assessment construct and the questions proposed for inclusion within the assessments. The assessments and resulting data on learner results, which is summarised within this report, are underpinned by thorough quality assurance processes that were completed prior to the 2017 to 2018 academic year. These processes are summarised below.

### 6.4.1 Scottish Government and Education Scotland reviews

Several meetings and workshops were held between Scottish Government (SG), Education Scotland (ES) and the ACER Partner Group (ACER UK in conjunction with ACER Group, SCHOLAR and TWIG) during the last months of 2016, to agree on refinement of the structures to be used in delivering the assessment instruments for P1, P4, P7 and S3. Among these meetings was a workshop held in Edinburgh, on 15 November 2016, to agree the approach, targeting, construct and number of clusters to be used in the adaptive design. Further refinements to the construct took place in meetings subsequent to this.

An SNSA Assessment Content Design workshop was held in Glasgow, on 13 December 2016. Following this discussion, a table of weightings comprising organisers and subcategories drawn from the provisional benchmarks<sup>12</sup> for Literacy and English, and for Numeracy and Mathematics, was forwarded to ACER by ES, on 16 December 2016. During the course of reviewing items with ES and SG literacy and numeracy nominees, and other SG-sponsored discussions with Scottish literacy and numeracy experts, several suggestions about adjustments to the construct received on 16 December emerged, and adjustments to the construct were progressively agreed.

On the basis of a review of Curriculum for Excellence and an audit of items in the ACER pool, ACER initially selected items for review by literacy and numeracy panels assembled by ES and SG. Two intensive face-to-face workshops were held at ES's Glasgow offices, to undertake the review of prospective items for the 2017 to 2018 scored assessments. The first workshop was held from 9 to 13 January 2017 and the second from 27 to 30 March 2017.

Table 7 shows the main activities undertaken in the development, review and customisation of items for the first live assessments, and development and review of replenishment items for trialling in the 2017 to 2018 academic year, in the period up to the end of June 2017.

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<sup>12</sup> Given the delivery date for the first year's assessments – August 2017 – the provisional benchmarks, published for consultation in August 2016, were used as the reference point for the first year of implementation of SNSA. The finalised benchmarks, published in June 2017, were used as the reference for the assessments constructed for the second year of implementation, delivered in August 2018.

Table 7: Development and review of SNSA item pool, October 2016 to June 2017

Date	Activity
October 2016 to January 2017	Assessment construct review and development
January to March 2017	SG/ES item review for 2017 to 2018 instruments, including inspection of items' alignment with CfE and Scottish culture and language; subsequent revision and customisation by ACER
April 2017	Blueprint with target ranges for CfE organisers agreed with SG
April to May 2017	Selection of items / construction of clusters / branching rules for 2017 to 2018 adaptive instruments by ACER

#### 6.4.2 Small-scale trialling – Local authority trialling phase

A 'Local Authority Trialling Phase', comprising a trial of assessments in reading, numeracy, spelling, and grammar and punctuation was conducted in five local authorities, from 13 February to 3 March 2017.

The purposes of this trialling were:

- to check the appropriateness of prospective assessment material for Scottish learners, particularly in terms of targeting difficulty levels
- to field trial the technical characteristics of the online system and its use in schools
- to collect local authority and teacher feedback on different aspects of the assessments.

Additionally, local authorities were asked whether they were willing to approach schools, asking whether some pupils might participate in 'cognitive laboratories' (sometimes known as 'usability testing'). The purpose of the cognitive laboratories was to gather information on learners' interaction with the assessments and assessment platform, including information at individual item level.

By the end of June, usability testing had been held in nine local authorities. The sessions were conducted by ACER Partner Group staff, on some occasions accompanied by an SG accessibility expert.

## 6.5 Appendix 5: Statistical reliability of the SNSA for academic year 2017 to 2018

To evaluate whether a set of items is psychometrically sound, it is necessary that each item discriminates effectively between learners who have the knowledge or skill that underpins the item and those who have not, and that the set of items as a whole measures a unified latent trait (for example, numeracy). One key summary statistic that is usually used to indicate whether items in an assessment are working well as a set is a reliability statistic, such as Cronbach's Alpha. According to this metric, reliabilities above 0.75 are typically considered as satisfactory and above 0.80 as excellent.

Table 8 shows Cronbach's Alpha reliability statistics for the 11 SNSA administered in the academic year 2017 to 2018.

Table 8: Assessments' reliability results

Assessment	Reliability
P1 numeracy	0.865
P1 literacy	0.861
P4 numeracy	0.868
P4 reading	0.899
P4 writing	0.864
P7 numeracy	0.879
P7 reading	0.872
P7 writing	0.802
S3 numeracy	0.905
S3 reading	0.888
S3 writing	0.823

The summary of the results presented in Table 8 shows that the reliabilities of all assessment forms were excellent (more than 0.80).

## 6.6 Appendix 6: Region descriptions from the 2017 to 2018 individual reports

For SNSA, in its first assessment year (2017 to 2018), each year group's capacity was reported in three broad regions: high, medium and low. The capacity of learners who achieved only a small degree of success on the assessment was labelled 'low'. Similarly, the capacity of learners who achieved a substantial degree of success on the assessment was labelled as 'high'.

Each broad region for the 11 Scottish National Standardised Assessments for the 2017 to 2018 academic year had an accompanying 'region description'. These descriptions were based on a summary of the skills, knowledge and understanding assessed in the questions used in this first assessment, which, in turn, were aligned with CfE benchmarks. The region descriptions for each stage are shown in Tables 9 to 19 below.

### 6.6.1 Numeracy region descriptions

Table 9: Region descriptions for P1 numeracy

Capacity region	Region description
High	Learners in this region are typically able to read and order whole numbers up to 100, including locating them on a number line. They are able to count backwards by 1s and to skip count forwards by 2s and 5s. They can also calculate half of a group of objects to solve a word problem. Learners are typically able to order coins according to their value, and to use indirect comparison and reasoning to compare the weights of objects. They can read o'clock times on an analogue clock and use a calendar to identify specific days and the number of days in a given month. Learners can use everyday language of location to place objects in position, including 'left' and 'right'; and they can extract information from tally charts, picture and column graphs to carry out calculations to solve word problems.
Medium	Learners in this region are typically able to read and order whole numbers up to 20, and match the numeral to a quantity of objects (including zero). They can continue a sequence of objects with a more complex structure and solve word addition problems involving single-digit numbers. They can also identify half of a familiar object and share a group of objects equally. Learners are typically able to identify coins and order them according to value. They are typically able to compare and order containers according to capacity, interpret a balance to compare the weights of objects, and use informal units to measure the length of objects. They can interpret a column graph to calculate the numerical total of one category.
Low	Learners demonstrating capacity in this region are typically able to read and order single-digit numbers and match the numeral to a quantity of objects (including zero). They can continue a sequence of objects with a simple structure, compare quantities of objects, and use appropriate descriptive language including 'the same', 'more' and 'most'. They are also able to use ordinal numbers in a real-life context. Learners in this region can compare lengths and heights of objects, extract information from simple column graphs and recognise familiar shapes.

Table 10: Region descriptions for P4 numeracy

Capacity region	Region description
High	Learners in this region are typically able to solve problems involving simple fractions. They can read analogue and digital times in 5minute intervals. These learners can also compare areas of rectangles on a

	grid, and extract information from picture and column graphs, in which one symbol represents multiple units and which include half symbols.
Medium	<p>Learners in this region are typically able to read and order whole numbers up to 10 000. They are able to solve problems, applying the correct operations (including multiplication and division) to complete calculations involving 2-digit numbers. They can use correct notation to represent fractions of a single item or a group of items, and use division to find a fraction of a group of items.</p> <p>Learners are also able to use money to pay for items and work out how much change they should receive. They can read analogue and digital quarter hour times and use a calendar to identify a specific day or date. Learners in this region are typically able to use a scaled tool to measure, identify the appropriate unit of measurement for a specific task, identify a survey question to gather specific data, and extract information from simple pie graphs. They can describe the likelihood of events occurring in everyday situations.</p>
Low	<p>Learners in this region are typically able to read and order whole numbers up to 1000, and to link a digit, its place and its value (including zero). They are able to solve simple problems, applying addition and subtraction to complete calculations involving single-digit numbers. Learners in this region are typically able to continue a skip count, identify half as a fraction of a single item, and to read analogue and digital o'clock and half hour times. They can compare lengths of objects, and extract information from simple picture graphs, column graphs and tally charts.</p>

Table 11: Region descriptions for P7 numeracy

Capacity region	Region description
High	Learners in this region are typically able to read and order whole numbers to at least 1000 000. They are able to carry out calculations to solve problems involving fractions and percentages. They can convert simple fractions to percentages. Learners are also able to interpret data from a variety of representations including line graphs and pie charts, including converting values in pie-charts to percentages.
Medium	Learners in this region are typically able to read and order whole numbers up to 1000 000. They are able to solve problems, applying the correct operations to complete calculations involving four-digit numbers and decimal numbers. They can locate a decimal fraction on a number line and convert simple fractions to decimal fractions. Learners are also able to read scaled instruments and carry out calculations involving the conversion of metric units, and hours and minutes, to solve problems.  They are able to interpret data from a variety of representations including tables, Venn diagrams and column graphs in which one symbol represents multiple units and which include half symbols. They can use the language of probability to describe the likelihood of events occurring.
Low	Learners in this region are typically able to read and order whole numbers up to 10 000.  They are able to solve simple addition and subtraction problems involving 2- and 3-digit numbers, and division problems with a single-digit divisor. Learners are also able to continue a skip counting sequence, calculate the total of a group of coins, and to convert between 12 hour and 24 hour times. They can use a key to extract information from column graphs and tally charts.

Table 12: Region descriptions for S3 numeracy

Capacity region	Region description
High	<p>Learners in this region are typically able to apply the correct operations (including multiplication and division) to complete calculations involving fractions. They use correct notation to represent fractions, and use division to find a fraction of a group of items or a single-digit number. Learners are also typically able to use a scaled tool to measure and identify the appropriate unit of measurement for a specific task. They can compare areas of rectangles on a grid, identify a survey question to gather specific data, and extract information from column graphs. They can describe the likelihood of events occurring in everyday situations.</p>
Medium	<p>Learners in this region are typically able to round numbers to at least 3 decimal places to solve problems. They can select and apply the correct operations to solve problems involving at least 3-digit decimal fractions. They can also convert between decimal fractions, percentages and fractions to solve problems involving different metric units, units of time and money amounts, and problems involving simple proportions, and ratios.</p> <p>They can calculate time durations across hours, days and months.</p> <p>Learners are typically able to interpret data from a variety of representations including two-way tables, line and pie graphs, and to draw appropriate conclusions. They can calculate the probability of events and express it as a percentage.</p>
Low	<p>Learners in this region are typically able to solve problems using all four operations, working with whole numbers and 2-digit decimal fractions and recalling number facts including the 12th multiplication table. They can convert metric units and calculate cost expressed as decimal fractions. They are able to interpret data from a variety of representations, including tables, column graphs and pie graphs in which one symbol represents multiple units and which include part symbols. They can calculate the probabilities of events, express these as fractions and decimal fractions, and understand the likelihood of a chance event expressed as a percentage.</p>

## 6.6.2 Reading (including P1 literacy) region descriptions

Table 13: Region descriptions for P1 literacy

Capacity region	Region description
High	Learners in this region are typically able to manage most aspects of decoding. They demonstrate strong phonological awareness, such as matching words that have the same middle sound. These learners can independently read and interpret sets of longer sentences with some complexities such as tracking pronoun references and interpreting 'but'. They can also locate prominent, directly stated information and make obvious links to explain events or actions in short narrative and information texts when there is little competing information. When a text is read aloud to them, these learners can interpret some complex ideas such as a metaphorical description of a familiar setting.
Medium	Learners in this region are typically able to identify all the letter sounds in short, phonetically regular words, including familiar digraphs (sh, ch, th). They can differentiate between similar sounding letters and identify words that rhyme. These learners can independently read and interpret sets of short sentences when the information is familiar and prominent. They can identify the title on a book cover and use illustrations to make familiar inferences. When a text is read aloud to them, these learners can locate directly stated information and make simple inferences based on obvious clues. They are also able to make links to connect clearly related ideas across paragraphs, discriminate between pieces of information with some similarities, and identify synonyms for words in a story.
Low	Learners in this region are typically able to distinguish letters and words from symbols and numerals as well as match together upper and lower case letters. They can recognise most letter sounds and identify the corresponding letters for the first and last sounds in words. These learners are able recognise high frequency words by matching them with corresponding images. When a text is read aloud to them, these learners can make predictions about the story from the illustrations on the front cover. They can also retrieve prominent information and make straightforward inferences from texts read aloud to them.

Table 14: Region descriptions for P4 reading

Capacity region	Region description
High	Learners in this region are typically able to read a wide range of familiar texts with comprehensive understanding. They can locate relevant details when there is competing information and make links between ideas across multiple sections of a text. They can identify the message of a narrative and make inferences about a character's behaviour, thoughts and feelings, when clues are scattered. They can infer reasons for prominent aspects of a text's structure, and interpret the main idea and purpose of short texts when there is some competing information.
Medium	Learners in this region are typically able to read a wide range of short familiar texts with reasonable understanding of the main meaning. They can recognise paraphrases and synonyms and locate directly stated information. They make simple inferences about a character's motive, mood and behaviour in narrative texts. These learners can recognise an idea that is clearly implied. They can make obvious links across adjacent sections of a text and use clear support from the context to interpret the meaning of less familiar words and phrases.
Low	Learners in this region are typically able to read a wide range of short, familiar texts with limited, mainly literal understanding. They can locate prominent, directly stated information in short narrative, persuasive, procedural and mixed texts and tables when there is little competing information. They make obvious links between ideas that are located close together, and make straightforward generalisations about a character's behaviour or mood when there are several clues and little competing information.

Table 15: Region descriptions for P7 reading

Capacity region	Region description
High	Learners in this region are typically able to read a wide range of texts with detailed understanding of some complex aspects. They can locate multiple pieces of information in dense descriptions and complex sentences when there is strongly competing information. Reading closely, they can make inferences about the narrator's viewpoint and a character's changeable or complex feelings in a narrative text. They can interpret arguments of some complexity, and recognise the main points and justifications for ideas as well as the writer's purpose and tone.
Medium	Learners in this region are typically able to read a wide range of texts with comprehensive understanding where the meaning is straightforward. They can locate details about cause and intention and other key pieces of information, and link ideas within and across paragraphs when there is competing information. When reading narrative texts, they can interpret clues to make inferences about characters' feelings, attitudes and motivations, and recognise implied ideas. These learners are able to identify the main idea and persuasive purpose of texts; they can interpret the writer's intention in persuasive texts. They can also use context to interpret the meaning of idiomatic expressions.
Low	Learners in this region are typically able to read a wide range of familiar texts with reasonable understanding of the main meaning. They can locate directly stated details in narrative, information, persuasive and procedural texts and tables. When reading narrative texts they can make straightforward inferences about characters' opinions, actions and motivations. They are able to track pronoun references and make links across texts when the connections are clear. They can use obvious contextual support to interpret the meaning of less familiar words and phrases.

Table 16: Region descriptions for S3 reading

Capacity region	Region description
High	Learners in this region are typically able to read a wide range of texts with a high level of understanding of several, substantial complexities. They read closely, and locate and interpret details about unfamiliar facts, content or style in information texts when there is highly plausible competing information. When reading narrative texts they make inferences about a character's behaviour and attitude, when there are challenging elements such as contradictory emotions or complex sentence structures. These learners can identify the main point of a multifaceted argument, interpret opposing points of view, and make justifiable deductions. They are able to analyse tone, style and writer's purpose in texts with substantial complexities.
Medium	Learners in this region are typically able to read a wide range of texts with reasonable understanding of a complex element. They can locate details embedded in complex sentences when there is much competing information, in a wide range of texts. They can make inferences about a character's contradictory emotions and primary concerns in narratives, reading closely to interpret the relevant evidence. They can also combine evidence from across the text to identify main ideas, understand counter-intuitive information and interpret complex language. These learners can evaluate the credibility of statements in context in persuasive texts. They are able to interpret tone, mood, authorial intent, persuasive techniques and the writer's point of view in texts of some complexity.
Low	Learners in this region are typically able to read a wide range of texts with comprehensive understanding where the meaning is straightforward. They can locate and sort key ideas and details across tables to make connections, and recognise paraphrased information when there are competing details in information texts. These learners can make inferences about a character's feelings in the presence of conflicting emotions, recognise a character's overriding concern and interpret attitudes in narrative texts of some complexity. They can read closely to make generalisations and recognise the effect of authorial comment and the main purpose of a text. They are also able to identify the likely audience for a text and the reason for choice of a title.

### 6.6.3 Writing region descriptions

Table 17: Region descriptions for P4 writing

Capacity region	Region description
High	<p>Learners in this region are typically able to spell common words of up to three syllables. They can also spell some less common short words when there is a spelling challenge such as a medial consonant that could be double or single (r, l); vowels that are combined; a medial silent letter; or a letter sound that is unpredictable.</p> <p>These learners can appropriately select articles for common nouns and select common prefixes. They can recognise the correct use of possessive pronouns and common paired conjunctions. They use a range of verb forms and adjectival clauses to complete sentences with mainly simple structures. They identify the need for capital letters in a title, and apostrophes in common contractions. They use some aspects of direct speech punctuation in sentences with simple structures.</p>
Medium	<p>Learners in this region are typically able to spell common words of one or two syllables and longer phonetically regular words. They can spell words with most common digraphs (ch, ck, gh, th) and familiar words with combined vowels or a double consonant. They can select appropriate prepositions to complete a phrase. They can identify simple verb forms and a range of common conjunctions to complete or join simple sentences. These learners identify the need for capital letters for familiar proper nouns.</p>
Low	<p>Learners in this region are typically able to spell common words of one or two syllables beginning and ending in two-consonant blends. They can spell familiar words with a few common digraphs (th, wh) or a pair of commonly combined vowels (ee, ea), or where one letter sound is ambiguous (c sounds like s). They can apply common rules such as adding -ed, removing e from the root word to add -ing, and doubling a final consonant to add -ing. They can typically identify very common conjunctions (and, then), and select common comparative adjectives, pronouns and verb forms to complete or join simple sentences. These learners can correctly place full stops and question marks in simple sentences.</p>

Table 18: Region descriptions for P7 writing

Capacity region	Region description
High	Learners in this region are typically able to spell a range of less common words when there are two spelling challenges, such as multiple medial consonants that could be double or single (m, r, l, s, p); various vowel combinations (ou, oi, ea, io); a letter sound that is ambiguous or often mispronounced; less common digraphs (mb, gh); or blends of three or four consonants. They can typically use a range of appropriate pronouns, prepositions and verb forms in complex, compound and simple sentences. They can apply a range of prefixes appropriately and name some common parts of speech. They can recognise where parentheses or commas should be used to separate short clauses or phrases, in complex sentences. They can typically punctuate direct speech.
Medium	Learners in this region are typically able to spell common words of up to five syllables and some less common shorter words with a spelling challenge, such as a multiple medial consonants that could be single or double (r, l, c, p, s); several combined vowels (ea, ie, io, ui, ou); or a medial letter sound that is unpredictable. They can select appropriate articles for common nouns, and identify simple possessive pronouns and common prefixes. They show understanding of a range of verb forms and adjectival clauses to complete simple and compound sentences. Regarding punctuation, they can typically place commas appropriately in complex sentences and use apostrophes in common contractions. They can identify aspects of simple direct speech punctuation.
Low	Learners in this region are typically able to spell common words of up to four syllables and some less common short words where there is a spelling dilemma, such as a single medial consonant that could be doubled (r, l); one pair of common combined vowels (ie, ou); or less common consonant blends and digraphs (dg, gh). They can spell common endings (ure, tion, ful, vowel/consonant/e pattern). These learners can typically select a range of verb forms to correctly complete a sentence, link sentences using a range of common conjunctions, and identify a redundant word in a simple sentence. In sentences with simple structures they can identify the correct positions for commas in lists and commas used to separate distinct clauses. They can identify where singular possessive apostrophes are required.

Table 19: Region descriptions for S3 writing

Capacity region	Region description
High	Learners in this region are typically able to spell less common words with several challenging features, such as medial consonants that could be double or single; multiple combined vowels (au, ou, oi, ea, io, ua); unusual consonant blends (gn); or a letter sound that is ambiguous, or often mispronounced or incorrectly omitted. These learners apply a wide range of grammatical conventions to complex sentence structures. They demonstrate technical accuracy in their knowledge of conventional usage in clause placement, co-ordination of conjunctions, and indefinite pronouns. They are able to detect ambiguity in pronoun references. Regarding punctuation, learners in this region typically select appropriate punctuation for a wide range of complex sentences. They can identify correct usage of singular and plural possessive apostrophes and select correct punctuation where direct speech is broken up.
Medium	Learners in this region are typically able to spell common words of up to five syllables and less common, shorter words with a challenging spelling feature, such as multiple medial consonants; several combined vowels (ea, ie, io, ui, ou); or a medial letter sound that is ambiguous or silent. These learners typically use a range of appropriate pronouns, prepositions and verb forms, in sentences with some structural complexity. They can choose correct prefixes and name common parts of speech. When punctuating, these learners are able to identify appropriate placement of parentheses, apostrophes for contraction and possession, and commas to separate short clauses. They can punctuate direct speech in a simple sentence.
Low	Learners in this region are typically able to spell common words of up to four syllables and some less common, short words where there is a spelling dilemma, such as a single medial consonant that could be double (r, l); or one instance of combined vowels (ie, ou). They can spell words with a range of consonant blends and digraphs (dg, gh) and common endings (ate, tion,). These learners typically select appropriate articles for common nouns, and correctly identify simple possessive pronouns and common prefixes. They use a range of verb forms and adjectival clauses to complete simple and compound sentences. They identify appropriate placement of commas in complex sentences and apostrophes in common contractions and for singular possession. They can identify some aspects of speech punctuation in sentences with simple structures.

#### 6.6.4 Interpretation of region descriptions

For each assessment, the region descriptions above were provided in the first section of each learner's individual report. In the other two school-level reports – the Group Diagnostic Report and the Group Aggregate Report – the overall capacity result ('low', 'medium', or 'high') was included.

The overall result for a learner on one of the 2017 to 2018 Scottish National Standardised Assessments indicated that he or she was approximately twice as likely as not to be able to succeed on questions addressing the skills, knowledge and understanding described in the relevant region description above. The capacity of learners who achieved only a small degree of success on the assessment was labelled 'low'. Similarly, the capacity of learners who achieved substantial success on the assessment was labelled as 'high'.



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