# PAT Reading

## Assessment framework



Australian Council *for* Educational Research

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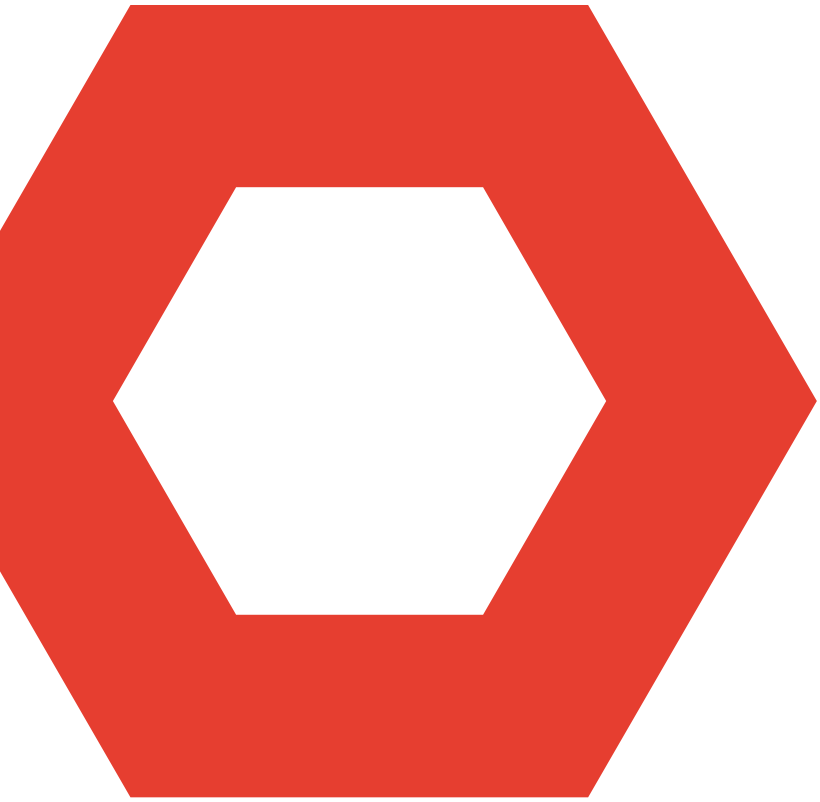


# Introduction

The ACER Progressive Achievement Tests in Reading, commonly known as PAT Reading, are a set of assessments that allow teachers to accurately and efficiently measure students' abilities in Reading, to diagnose gaps, strengths and weaknesses in student learning, and monitor student progress over time. The assessments have been developed especially, but not exclusively, for use in Australian schools and results can be compared to representative Australian norms at each year level. The PAT Reading construct is appropriate for broad international use, and has been adapted to form the basis of a number of assessments developed by ACER for international contexts.

PAT Reading assesses a range of text types and skill areas to ensure that the breadth of students' reading comprehension abilities are being captured. The assessments are designed to be engaging and to encourage students to interact with the content to the best of their ability.

A summary of each of ACER's PAT Reading assessments is provided here. More information about the delivery and reporting of the online assessments can be found within the Help section of the Online Assessment and Reporting System (OARS).

## PAT Reading Adaptive

*PAT Reading Adaptive* (2021) is the most recently developed assessment to use the PAT Reading construct. The assessment comprises a number of testlets (small blocks of test items), of which there are eight different entry levels. In total, students complete three testlets in a sitting.

Entry levels are automatically assigned to students depending on their previous PAT Reading scale score or their current year level. After completing each testlet, students are automatically allocated another group of items of targeted difficulty based on their cumulative performance to that point.

The design of *PAT Reading Adaptive* allows for more accurate targeting of students' ability levels and removes the need for teachers to select appropriate test levels for their students.

## PAT Reading 5th Edition

*PAT Reading 5th Edition* (2018) comprises test forms ranging from Test 1 to Test 10 and can be administered according to student ability, based on previous scale score and the educator's professional judgement.

The fixed format, linear construction of these tests allow teachers to compare the performance of a group of students on a shared set of test items.

## PAT-R Comprehension

PAT-R Comprehension (2007) is available as part of *PAT-R Fourth Edition*, a pen-and-paper assessment instrument.

For more information, please refer to the *Teacher Manual, Progressive Achievement Tests in Reading: Comprehension, Vocabulary and Spelling Fourth Edition* (Stephanou, Anderson & Urbach, 2007).

# Rationale for PAT Reading

Reading is a core competency that, in teaching and learning contexts, is applicable to all discipline areas. Developing students' reading comprehension ability is therefore generally understood as an essential goal of education. Monitoring and evaluating students' reading comprehension ability is a necessary part of achieving this goal.

## Progressive Achievement approach

The Progressive Achievement approach provides a framework for integrating student assessment, resources that support teaching practice, and professional learning. PAT assessments allow teachers to collect evidence of student learning; to identify where students are in their learning at a given point in time; to monitor growth over time; and to reflect on student attainment. They provide reliable measures that enable a variety of interpretations about attainment and progress, such as:

- what students attaining specific levels of progression are likely to know, understand and be able to do;
- how much students have improved over time and what skills, knowledge and abilities they have been able to develop; and
- how a student's level of achievement compares with other students'.

The value of an integrated approach to assessment and student learning has become widely acknowledged. There is now a wide variety of formative, diagnostic assessment tools used in Australian classrooms. Summative assessments, such as NAPLAN, are also often used to inform teaching and learning. As Dylan Wiliam (2011, p. 43) makes clear, 'any assessment is formative to the extent that evidence about student achievement is elicited, interpreted, and used by teachers, learners, or their peers to make decisions about the next steps in instruction'. In his Report, David Gonski (2018, Finding 7) refers to the compelling evidence that 'tailored teaching based on ongoing formative assessment and feedback is the key to enabling students to progress to higher levels of achievement.'

ACER's PAT tests provide indicators of student achievement via scale scores and the accompanying achievement band descriptions. Upon completing their assessments, students are allocated a scale score that represents their ability in reading comprehension. The PAT scale is divided into achievement bands from which the skills and understanding represented at each level are described. The achievement bands provide valuable evidence-based information about the concepts and skills students have achieved, are consolidating and are working towards. As the Gonski report recommends, reporting on assessment should have an emphasis on achievement and growth and that growth should be measured against learning progressions (Gonski, 2018, Recommendation 4). Masters (2013) also expresses the idea that learning should be assessed by measuring growth over time and against empirically derived learning progressions.

The PAT reports provide targeted formative feedback, allowing the student data to be sorted and analysed in a variety of ways. Using the PAT data and the achievement band descriptions, teachers can structure learning specifically to students' needs, rather than where they are expected to be.

# Progressive Achievement in Reading

The PAT Reading assessment is designed to target the key skills and concepts that underpin growth, and to assist teachers in understanding the progression of reading skills through the PAT reports and teaching resources.

Higher student growth in reading comprehension is achieved when teachers have information about their students' reading progress, and using assessment to inform teaching ensures that instruction is timely and appropriate to students' needs (Förster et al., 2018, p. 99, Conley & Wise, 2011, p. 97). PAT Reading assists in informing teaching by categorising reading comprehension into four strands: Retrieve, Interpret explicit, Interpret implied, and Reflect. Student performance can be analysed by strand, so that teachers can identify learning needs and monitor progress at this more formative level. PAT Reading also assesses students on a range of text types, offering another avenue for the analysis of student performance. Reading comprehension is a highly complex area of achievement, one that needs to be understood as the coordination of a number of integrated processes (Kendeou et al., 2016, p. 63; Conley & Wise, 2011, p. 93; O'Reilly et al., 2014, p. 404). These integrated processes have been incorporated into the design of the PAT Reading assessments through the strand processes. These processes provide a finer grained understanding of student performance and can more specifically inform areas for targeted teaching. Resources within the PAT Teaching Resources Centre are organised by strand process within each of the strands, at the relevant achievement band level, and can be used for differentiated classroom practice and to monitor more specific areas of growth.

While growth indicators are available for many formative assessment tools, the PAT Reading achievement band descriptions are evidence-based, developed from valid and reliable assessment data that have identified a 'typical' trajectory of reading comprehension development. This can provide teachers with confidence in the data they are using to target areas of learning, and to identify how students' progress over time.

# PAT Reading and the curricula

The Australian national curriculum, and all state curricula, describe expected levels of performance in reading comprehension based on year or stage level. Reading comprehension appears throughout English curricula, supported by content descriptors. Reading comprehension is now more commonly taught in schools as part of literacy programs, but the skills are applicable across all learning domains.

PAT Reading items are not explicitly developed according to the Australian Curriculum, as the PAT construct is based on a Progressive Achievement approach, rather than year-based expectations. Reading comprehension is typically one component of the broader English curricula, which also incorporate vocabulary, writing, and verbal communication skills. PAT Reading results do not directly align with curriculum-based year or stage level outcomes. But items are mapped to the Australian curriculum and some state curricula, with content codes and descriptions provided in the online reports and the PAT Teaching Resources Centre.

PAT Reading assesses reading comprehension skills in more depth than curricula, which generally describe the skills in broader terms. For this reason, there is often a single content description aligned to many test items at similar levels of difficulty. A single test is likely to be aligned to curriculum descriptions across a range of year levels, because each test assesses a range of ability.

# Construct

## Definition

A construct is a description of an ability that can be measured on a single dimension (with a single numeric variable). It often refers to 'what students know and can do'. A mathematical model is used to transform observations (eg student responses to test items) into measurements. A careful definition of ability/proficiency helps ensure that the assessment and reporting are consistent and legitimate.

The ability to read and understand text is fundamental to full participation in modern adult life. It is essential to educational progress across domains, but increased literacy levels are also linked to positive outcomes in employment and health. Reading includes a broad variety of perceptual, linguistic, and cognitive skills required to extract meaning from visually presented material, most commonly, written text. Proficient reading takes years to develop and involves both understanding a language (comprehension) and understanding the symbolic representation of that language as written text (learning to read aloud).

PAT Reading aims to measure the essential skill of reading comprehension. The assessments require students to utilise a variety of processes in a range of contexts as reflected by different written texts on an online platform. PAT Reading captures the range of skills competent readers adopt in the construction of meaning, from retrieving discrete pieces of information, to maintaining and developing understanding, to using previous knowledge in the critical evaluation of information. With these considerations in mind, the simple definition of Reading relating to the PAT assessment is:

***Reading comprehension*** *is the understanding and evaluating of texts for the purpose of developing and using knowledge to engage with society.*

## Structure

The PAT Reading construct is the organising principle of the assessments; it is used to guide test development and structure the PAT reports. This structure is also part of the Progressive Achievement approach because the knowledge, skills and understanding represented in the assessments is designed to support educators in identifying student needs.

Four overarching elements guide assessment development:

- Strands
- Strand processes
- Text types
- Text formats

### Strands

The first aspect of the construct is of key importance – the strands that students utilise when engaging in the act of reading. The strands are the core competencies that form the foundation of textual understanding. As core competencies, they are essential to growth in student learning across a range of disciplines. When developing test items, each is targeted to one strand. The PAT Reading strands are an organising component of the PAT reports, so that educators can analyse the performance of students according to these different skill areas.

There are four strands used in PAT Reading:

- Retrieve
- Interpret explicit
- Interpret implied
- Reflect

Progression in the PAT Reading strands is reflected by the achievement band descriptions, as discussed in the section Reporting.

## Retrieve

Retrieving directly stated information requires students to locate and understand one or more discrete pieces of explicitly stated information in the text. The focus is on finding and recognising the meaning of a piece of information rather than on understanding how this information might fit into the larger meaning of the text. The extent to which students understand the meaning of a piece of information is usually assessed by their capacity to put this information into their own words or recognise a reworded version of the information.

The skills students use in retrieving directly stated information underpin the skills of interpreting explicit information and interpreting implied information, as students have to first locate the relevant information in order to interpret it and they need to find the relevant clues or evidence on which to base their inference.

## Interpret explicit

Interpreting explicit information requires students to locate and interpret explicitly stated information. Students may need to interpret the meaning of a phrase, summarise information or make links or connections between pieces of information. Interpreting explicit information tends to focus on the meaning of the whole text, paragraph or section of the text and the way ideas are connected and related as distinct from retrieving directly stated information, which focuses on the location and understanding of discrete pieces of information.

## Interpret implied

Interpreting implied information requires students to recognise an idea that is suggested or implied by the text but is not explicitly stated. Students often need to combine information from scattered clues to infer the meaning. The focus is on understanding what the clues or evidence in the text implies.

Generalisations about all or part of the text, and ideas that underpin the text, but are not explicitly stated, are also classified as interpreting implied information. For example, the main idea of a text may not be explicit in a heading or in the opening sentences, so students may need to gather clues and hints to work this out. Generalising about the key attributes of a character across an extended piece of text and making judgements to differentiate details from key qualities, when these are not explicitly identified, also requires students to make inferences based on evidence in the text.

The skills students use when retrieving directly stated information are also required for interpreting implied information, as students have to locate the relevant clues before they can interpret them. Students may also have to interpret explicit information as part of the evidence that supports an inference.

## Reflect

Reflecting on the form or content of the text requires students to bring some external knowledge to the text.

Reflecting on the form of the text is about the technical features of the text. It is concerned with structure and linguistic features, including stylistic devices and print conventions. Students need prior knowledge in order to name them. They also need to know what the relevant criteria might be if they are required to evaluate them.

Reflecting on the content of the text is about the meaning of the text. Students may be required to evaluate the quality of an argument or its bias, the coherence of a plot, the plausibility of a character's actions or anything else concerned with reflecting on the meaning of the text. Students need to know the relevant criteria or appropriate personal values to use in evaluating the content of the text.

The reflecting questions in PAT Reading are mainly about reflecting on the form. Reflecting on the content is usually about students' personal evaluations of the text or opinions about the efficacy of the writer's craft where students provide evidence from the text to support their evaluations of a text. It is not possible to assess reasons for personal evaluations of a text in the multiple-choice format of PAT Reading. Students are asked to make and justify evaluations of texts in these teaching and learning activities because this is an important component of reflecting on texts.

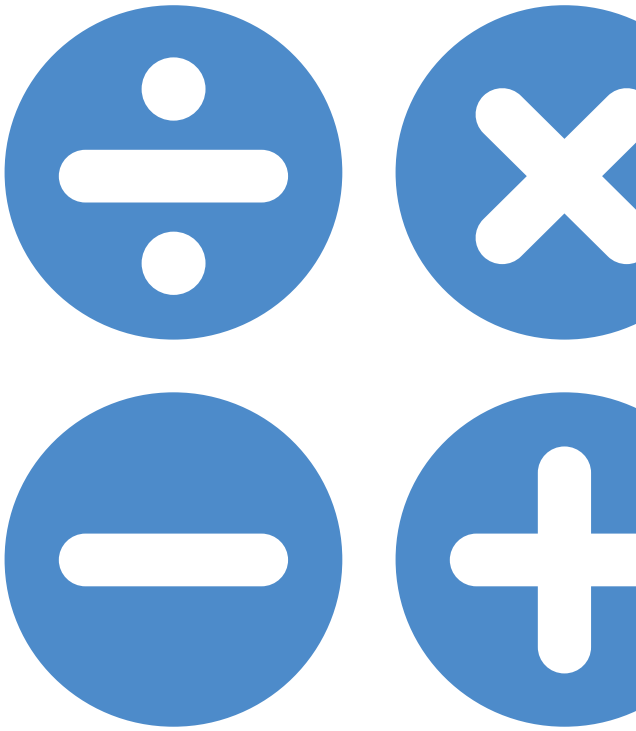
## Strand processes

While the PAT Reading strands are broad categorisations of reading comprehension skills, the PAT Reading strand processes offer a way of further focusing learning intentions. By being able to identify the processes by which students retrieve, interpret or reflect on texts, teachers achieve a finer grained understanding of students' gaps and strengths within each of the core skill areas, and are therefore better able to target students' learning needs.

PAT strand processes are a new classification developed for reporting of the *PAT Reading Adaptive* assessment and align to the organisation of teaching activities in the PAT Teaching Resources Centre.

***Table 1*** *Strand processes classified by strand*

| Retrieve | Interpret explicit | Interpret implied | Reflect |
|---|---|---|---|
| Scanning for key information | Developing an interpretation | | Recognising textual features and purpose |
| Navigating text structures | Comparing and contrasting | | Recognising authorial techniques |
| Rewording | Generalising and summarising | | Extrapolating beyond the text |
| Classifying and re-organising | Making connections | | Evaluating and critiquing |
| Labelling | Interpreting language and tone | | |
| Using grammatical structures | | Reasoning | |



## Retrieve

### Scanning for key information

Scanning for information, the process of running your eyes over a text for specific words and phrases, is a skill that precedes all others in reading comprehension. All information that needs to be interpreted, analysed or evaluated must first be located. Scanning is made more or less difficult depending on where the required information is located in the text.

### Navigating text structures

Readers learn to navigate a variety of different text structures when looking for information, such as texts with graphs or diagrams, timetables, maps or images. Familiarity with the structures of different texts and an understanding of how different textual components relate to each other is essential to reading across a range of contexts.

### Rewording

Part of retrieving information involves recognising pieces of information that are written in different ways. It is common practice to scan for information that may not be written in the same way that the reader expects. The complexity of this process varies from recognising simple synonymous matches to rephrasing quite complex ideas. The emphasis here is on identifying different ways of writing the same thing, rather than being required to make significant interpretations.

### Classifying and re-organising

Classifying and re-organising is about recognising similarities between pieces of information, and grouping them accordingly. Identifying information from different locations that share particular features is also a common skill utilised in a variety of different contexts.

### Labelling

Labelling is the process of matching words and images, thereby indicating knowledge of a single word or simple phrase (such as an action). This process is relevant at the lower ability levels, where students are not yet independent readers but are able to identify, for example, that a girl looking at a book indicates reading, or which child from a group of several images is jumping, or more simply which of several objects is the cat. This skill is an important precursor to understanding words strung together to make meaning in sentences.

### Using grammatical structures

A knowledge of grammar is important for reading comprehension. In the early stages of learning to read, a basic understanding of grammatical structures is needed to make meaning, such as recognising pronoun references and the differences in meaning between prepositions, in order to successfully retrieve information. Knowledge of more complex grammatical structures provides access to more complex meaning in a text.

## Interpret explicit and Interpret implied

### Developing an interpretation

This is the process of identifying and integrating the appropriate information in a text in order to form an interpretation. Readers engage in the process of combining information to identify key ideas. The act of reading on and backtracking are commonly used in the collection of evidence to form an interpretation. When making an interpretation, readers learn ways of identifying the evidence that is relevant and dismissing the information that is not.

### Comparing and contrasting

The process of comparing and contrasting information is fundamental to our development as both readers and critical thinkers. The act of reading involves relating, differentiating and making distinctions between ideas. It is from learning and understanding this process that readers become better equipped to evaluate and critique information. Comparing and contrasting involves such processes as distinguishing between different perspectives, recognising subtle shifts in attitude or point of view, identifying ideas that support each other, and differentiating key ideas and details.

### Generalising and summarising

Generalising and summarising is the process of relating information across a text, or section of a text, to identify what it is mainly about. The ability to read over and accurately understand the main idea in a text is commonly utilised in our day to day experience and so requires systematic practice in the school years, particularly the process of integrating and synthesising information.

### Making connections

Interpretations are often made through the linking of information from different places within a text. Making connections is the process used for sequencing events, identifying the reasons for events, or relating a character to a behaviour or action, to name a few. Explicit support is required to learn how to connect ideas at different locations in the text and across a range of different text types and structures.

### Interpreting language and tone

Interpretations require the navigation of language, and sometimes complex language structures. Developing in Reading ability involves learning how language is used in the construction of tone and atmosphere. Explicit support is needed in understanding the role that language plays in the forming of interpretations and how difficult or unfamiliar language can be approached.

### Reasoning (Interpret implied only)

To reason in the act of reading is to use the evidence to deduce or predict, hypothesise or otherwise extend the ideas in the text. Reasoning often involves the use of logic to make distinctions between possible interpretations or to recognise the implication arising from a particular interpretation. It is an important development from making simple interpretations to learning how to more carefully consider and utilise the evidence in a text.

## Reflect

### Recognising textual features and purpose

The ability to recognise a text type and its features, and to understand their purpose, is an essential component of learning to read. It is the foundation on which more complex evaluations about text construct can be built.

### Recognising authorial techniques

The techniques authors employ in the communication of information and ideas is rich and varied. Recognising what these techniques are is an essential part of learning to think critically about texts, as well as knowing when and how to employ them in your own writing.

### Extrapolating beyond the text

The process of extrapolating beyond the text involves the application of external knowledge or contexts to the ideas in the text. This can be in making a prediction (beyond that which the author has clearly implied), applying ideas to a new context, reflecting on information from different perspectives, or deducing practical applications of information. This process is a critical part of relating information to the world outside the text, in particular identifying appropriate uses.

### Evaluating and critiquing

Evaluating and critiquing involves using knowledge, experience and understanding to make judgements about the ideas in a text, to engage with concepts critically and to evaluate the success of communicating ideas in particular ways. This process is an essential component of critical thinking.

## Text type

Reading comprehension ability can only be clearly demonstrated by the assessment of a range of text types. The text types are an organising component of the PAT reports, so that educators can analyse the performance of students according to the types of texts they have responded to.

For PAT Reading there are five text types assessed:

- Narrative
- Information
- Persuasive
- Procedural
- Word or sentence

It should be noted that not all *PAT Reading 5th Edition* tests or *PAT Reading Adaptive* pathways assess all of these text types. For example, procedural texts are not as appropriate for more proficient readers, as they are rarely highly complex. Word or sentence is only appropriate for very early readers. But each adaptive pathway, like each linear test form, contains a minimum of three text types.

Where the appropriate category type for a text is unclear, the style of the language is used to determine which category is most appropriate. For example, a biography may use descriptive language to develop a story about a real person, in which case it has most in common with narrative. If the biography is primarily a factual account, it is considered information. If it is attempting to influence the reader by representing the person in a particular way, it is considered persuasive.

**Narrative**

This category includes all fictional texts of a variety of genres (eg reflective, character-based, action-driven etc.)

**Information**

This category includes any text where the primary purpose is to communicate information. Topics range from graphical representations of a current issue to historical recounts.

**Persuasive**

This category includes any text that attempts to influence or persuade its audience in some way. This can range from advertisements to online discussion forums to opinionated newspaper articles.

**Procedural**

This category includes any text in which the reader must follow a procedure or list of instructions for comprehension.

**Word or sentence**

This category relates to those items assessing single words or sentences. At this early stage in the development of Reading skills, text type is not particularly relevant; the focus is on the reader's ability to make meaning from very small amounts of text.

This text type is a new addition to *PAT Reading Adaptive* and does not appear in *PAT Reading 5th Edition*.

## Text format

PAT Reading presents a range of text formats to reflect different Reading processes. This is a consideration for test development and selection but is not an organising element of the PAT reports.

There are three text formats used in PAT Reading:

- Continuous
- Non-continuous
- Mixed

**Continuous**

These are prose texts, made up of sentences and commonly organised into paragraphs. There may be markers (such as headings) to support and guide readers.

**Non-continuous**

These texts are not made up of continuous prose and require a different reading approach. Common non-continuous texts are lists, diagrams, graphs, advertisements and schedules.

**Mixed**

These texts are made up of continuous and non-continuous components, such as a diagram with an explanatory paragraph. The two components will support one another in creating meaning.

# Assessment design

## Measuring the construct

In developing items and designing the tests, the major criteria considered are as follows:

- distribution of items across strands
- distribution of text types (text formats are considered as part of this)
- distribution of item difficulty
- appropriateness of texts

### Distribution by strand and text type

It is necessary to assess students on an appropriate distribution of strands and text types, so that the assessment encompasses a range of reading processes and experiences. This approach ensures that the formative data gained provides insight into possible strengths, gaps and weaknesses in different areas. The strands and text types are not evenly distributed across all levels, because some are more appropriate at the lower levels than the higher and vice versa. Word and sentence comprehension, for example, is only targeted at very early readers, and there is more to assess in the Reflect strand as students develop in ability, so more of these items appear at the higher levels.

Table 2 shows the distribution of items by strand and text type in each of the *PAT Reading 5th Edition* tests.

In the lower pathways of *PAT Reading Adaptive*, a majority of items – between 60% and 90% – assess the strands Retrieve and Interpret explicit. Fewer items at these lower levels assess the strand Interpret implied – up to approximately 20% in a given pathway. Reflect items only appear occasionally, which is appropriate for younger and less-developed readers. At the upper levels of *PAT Reading Adaptive*, the proportion of items assessing the strand Retrieve diminishes, generally below 20%, while there is a greater proportion of Interpret implied and Reflect items. Items assessing these strands generally require students to apply more complex or nuanced comprehension skills.

Items at the lower levels of *PAT Reading Adaptive* are heavily weighted towards the text type Word or sentence – up to 60% of each pathway. This is particularly appropriate for emerging readers, who may still be building their decoding skills to support their reading comprehension. Word or sentence texts are not assessed in the mid to upper levels of *PAT Reading Adaptive* as students at these levels are clearly independent readers. Narrative texts appear most consistently across all levels, generally comprising between 30% and 60% of items in any given pathway, while items assessing Persuasive texts, which tend to incorporate more sophisticated authorial techniques, are more common in the upper levels of *PAT Reading Adaptive*. Procedural texts appear predominantly in the middle levels of *PAT Reading Adaptive*, where they comprise up to approximately 20% of assessed texts.

***Table 2*** *Percentages of PAT Reading 5th Edition items by strand and text type for each test*

| | Strand % | | | | Text type % | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Test level | Retrieve | Interpret explicit | Interpret implied | Reflect | Information | Narrative | Persuasive | Procedural | Word or Sentence |
| Test 1 | 29 | 71 | | | 57 | 43 | | | |
| Test 2 | 31 | 34 | 14 | 21 | 21 | 45 | 17 | 17 | |
| Test 3 | 35 | 19 | 39 | 6 | 45 | 35 | 19 | | |
| Test 4 | 17 | 34 | 31 | 17 | 14 | 52 | 17 | 17 | |
| Test 5 | 24 | 28 | 24 | 24 | 41 | 41 | 17 | | |
| Test 6 | 9 | 21 | 59 | 12 | | 38 | 47 | 15 | |
| Test 7 | 14 | 34 | 29 | 23 | 31 | 34 | 34 | | |
| Test 8 | 18 | 12 | 53 | 18 | 32 | 53 | 15 | | |
| Test 9 | 17 | 37 | 26 | 20 | 26 | 63 | 11 | | |
| Test 10 | 14 | 43 | 29 | 14 | 40 | 60 | | | |

## Distribution of item difficulty

It is important to have a spread of item difficulties that match the abilities of the students. This is especially important in the context of a computer adaptive test to enable efficient convergence of the algorithm.

Table 3 shows the mean difficulty of the items in each of the *PAT Reading 5th Edition* tests in scale score units, with their standard deviations. Standard deviation measures the amount of variation in item difficulty for a set of items.

***Table 3*** *Mean difficulty and standard deviation of each PAT Reading 5th Edition test*

| Test level | No. of items | Mean item difficulty (scale score) | Standard deviation (scale score) |
|---|---|---|---|
| Test 1 | 14 | 65.6 | 9.0 |
| Test 2 | 29 | 98.2 | 10.5 |
| Test 3 | 32 | 99.9 | 9.0 |
| Test 4 | 29 | 109.2 | 13.9 |
| Test 5 | 29 | 116.6 | 13.3 |
| Test 6 | 34 | 123.0 | 11.0 |
| Test 7 | 35 | 123.5 | 10.9 |

***Table 3*** *Cont.*

| Test level | No. of items | Mean item difficulty (scale score) | Standard deviation (scale score) |
|---|---|---|---|
| Test 8 | 34 | 131.0 | 7.4 |
| Test 9 | 35 | 138.7 | 7.7 |
| Test 10 | 35 | 143.7 | 7.7 |

Table 4 shows the mean difficulty and standard deviations of the items in PAT Reading Adaptive upon its release in 2021. Testlets later added to these locations (testlet containers) have similar mean item difficulties and standard deviations.

***Table 4*** *Mean difficulty and standard deviation of PAT Reading Adaptive testlets*

| Testlet location | | No. of items | Mean item difficulty (scale score) | Standard deviation (scale score) |
|---|---|---|---|---|
| Stage 1 | Level 1 | 10 | 77.5 | 9.0 |
| | Level 2 | 10 | 94.2 | 10.7 |
| | Level 3 | 10 | 101.5 | 9.7 |
| | Level 4 | 10 | 114.7 | 9.2 |
| | Level 5 | 10 | 126.4 | 10.0 |
| | Level 6 | 12 | 130.3 | 8.5 |
| | Level 7 | 12 | 136.3 | 8.2 |
| | Level 8 | 12 | 142.6 | 7.1 |
| Stage 2 | Level 1 | 10 | 71.4 | 7.6 |
| | Level 2 | 10 | 86.7 | 6.8 |
| | Level 3 | 10 | 97.3 | 6.3 |
| | Level 4 | 10 | 108.0 | 9.5 |
| | Level 5 | 10 | 118.3 | 9.3 |
| | Level 6 | 12 | 126.2 | 6.6 |
| | Level 7 | 12 | 134.3 | 7.4 |
| | Level 8 | 12 | 138.5 | 5.0 |
| | Level 9 | 12 | 142.1 | 8.2 |

***Table 4*** *Cont.*

| Testlet location | | No. of items | Mean item difficulty (scale score) | Standard deviation (scale score) |
|---|---|---|---|---|
| Stage 3 | Level 1 | 10 | 59.5 | 6.5 |
| | Level 2 | 10 | 81.1 | 7.2 |
| | Level 3 | 10 | 95.2 | 7.1 |
| | Level 4 | 10 | 103.0 | 5.9 |
| | Level 5 | 10 | 116.5 | 7.2 |
| | Level 6 | 12 | 123.7 | 4.7 |
| | Level 7 | 12 | 127.5 | 8.1 |
| | Level 8 | 12 | 137.4 | 6.3 |
| | Level 9 | 12 | 142.5 | 5.4 |
| | Level 10 | 12 | 145.7 | 8.2 |

## Appropriateness of the texts

Learning progression in Reading does not depend extensively on taught content, but instead comprises the ability to apply more advanced skills and processes to comprehend and use increasingly complex texts. It is also important that students' interest and engagement with the assessment is maintained. It is therefore necessary to consider the appropriateness of the texts utilised in PAT Reading for students of different ages and year levels. In *PAT Reading 5th Edition*, higher test levels contain items that use more complex texts that also relate to topics suitable for older children, while lower test levels use texts suitable for younger or less advanced readers. Likewise, texts are in general more complex in the upper testlets within *PAT Reading Adaptive*.

# Delivery

## Choosing the right test

Planning and consistency are important in ensuring PAT Reading is used effectively and that students' results are useful and meaningful. For *PAT Reading 5th Edition*, the difficulty of a test and the teacher's knowledge of a student should be taken into consideration when selecting an appropriate level. Curriculum appropriateness and the context of the classroom also need to be taken into account when making this decision. There is often a wide range of ability within the classroom and reading skills exist on a continuum, so it is not necessary to provide all students in a class with the same test. Instead the focus should always be each student's ability at the time of the assessment, not where they are expected to be.

The structure of *PAT Reading Adaptive* removes the need to manually choose and assign test levels to students.

## Frequency

For the purpose of monitoring student progress, a gap of 9 to 12 months between PAT Reading testing sessions is recommended. Learning progress may not be reflected in a student's PAT Reading scale scores over a shorter period of time. Longitudinal growth should be measured over a minimum of two years of schooling, or three separate testing sessions, in most contexts. This will help account for possible scale score variation, for example where external factors may affect a student's performance on a particular testing occasion.

## Test administration

Teachers are required to supervise test administration. Practice items are available to support administration of the tests. The recommended test administration time is 40 minutes for *PAT Reading 5th Edition* and 45 minutes for *PAT Reading Adaptive*. This should be sufficient for all students to complete their tests. Consistency in the time allowed to students will assist teachers in comparing the results of students.

## Item response formats

*PAT Reading 5th Edition* and *PAT Reading Adaptive* are online assessments. The vast majority of items in *PAT Reading 5th Edition*, and all items in *PAT Reading Adaptive*, use a selected response item format (eg multiple-choice and complex multiple-choice). When the selected response format is not suitable for the skill being targeted, an interactive item type (eg drag-and-drop or hotspot format) may be used. Drag-and-drop items are particularly appropriate for identifying the sequencing of events in a narrative. In most instances for a Reading assessment, interactive item types are not necessary to assess the target skill. Examples of different item types are provided in Appendix 3.

## PAT Reading 5th Edition

*PAT Reading 5th Edition* is a suite of linear test forms ranging from Test 1 to Test 10 and can be administered according to students' ability, based on their previous scale score as well as the educator's professional judgement.

***Table 5*** *Summary of test delivery details for PAT Reading 5th Edition*

| Test level | Generally suitable for | No. of items | Time allowed |
|---|---|---|---|
| Test 1 | Year 1 | 14 | 25 minutes |
| Test 2 | Year 1, Year 2, Year 3 | 29 | 40 minutes |
| Test 3 | Year 2, Year 3, Year 4 | 32 | |
| Test 4 | Year 3, Year 4, Year 5 | 29 | |
| Test 5 | Year 4, Year 5, Year 6 | 29 | |
| Test 6 | Year 5, Year 6, Year 7 | 34 | |
| Test 7 | Year 6, Year 7, Year 8 | 35 | |
| Test 8 | Year 7, Year 8, Year 9 | 34 | |
| Test 9 | Year 8, Year 9, Year 10 | 35 | |
| Test 10 | Year 9, Year 10 | 35 | |

## PAT Reading Adaptive

A testlet-based adaptive model or multistage testing (MST) is used for *PAT Reading Adaptive*. A testlet is a small block of items presented to a student. Testlet containers at each stage and level of *PAT Reading Adaptive* comprise several testlets covering comparable distributions of item content and difficulty. The content and difficulty of testlets in containers are simpler at lower levels and more advanced at higher levels.

Students' entry levels are automatically assigned depending on their estimated ability – according to their most recent PAT score in the learning area and/or their current year level. After completing a testlet at each stage, students are allocated another testlet of items of targeted difficulty based on their cumulative performance to that point. The branching mechanism is designed to provide the maximum amount of information for estimating a student's ability (mean scale score) at each stage after the first testlet.

Testlet containers allow the allocation of different but equivalent content to students according to various system rules. 'Parallel' testlet rules mean that students are presented alternative content in consecutive *PAT Reading Adaptive* test sittings, reducing their potential exposure to the same content. Testlet containers also support the delivery of 'accessible' items to students requiring test content that is compatible with screen readers or other assistive technologies. If a student is assigned an accessible *PAT Reading Adaptive* test, they will only be presented testlets containing items that meet the Web Content Accessibility Guidelines (WCAG) 2.1 AA Standard. Parallel accessible testlets are not currently available.

Figure 1 displays the PAT Adaptive MST design for a panel at an entry level. There are eight entry levels for *PAT Reading Adaptive*. At each entry level between levels 2 and 6, a panel of MST consists of eleven testlet containers and thirteen pathways. Figure 2 displays the overall *PAT Reading Adaptive* test design consisting of eight entry levels for increasing levels of item difficulty/student ability.

***Figure 1*** *Panel design for PAT Reading Adaptive at an entry level, including parallel and accessible testlets*

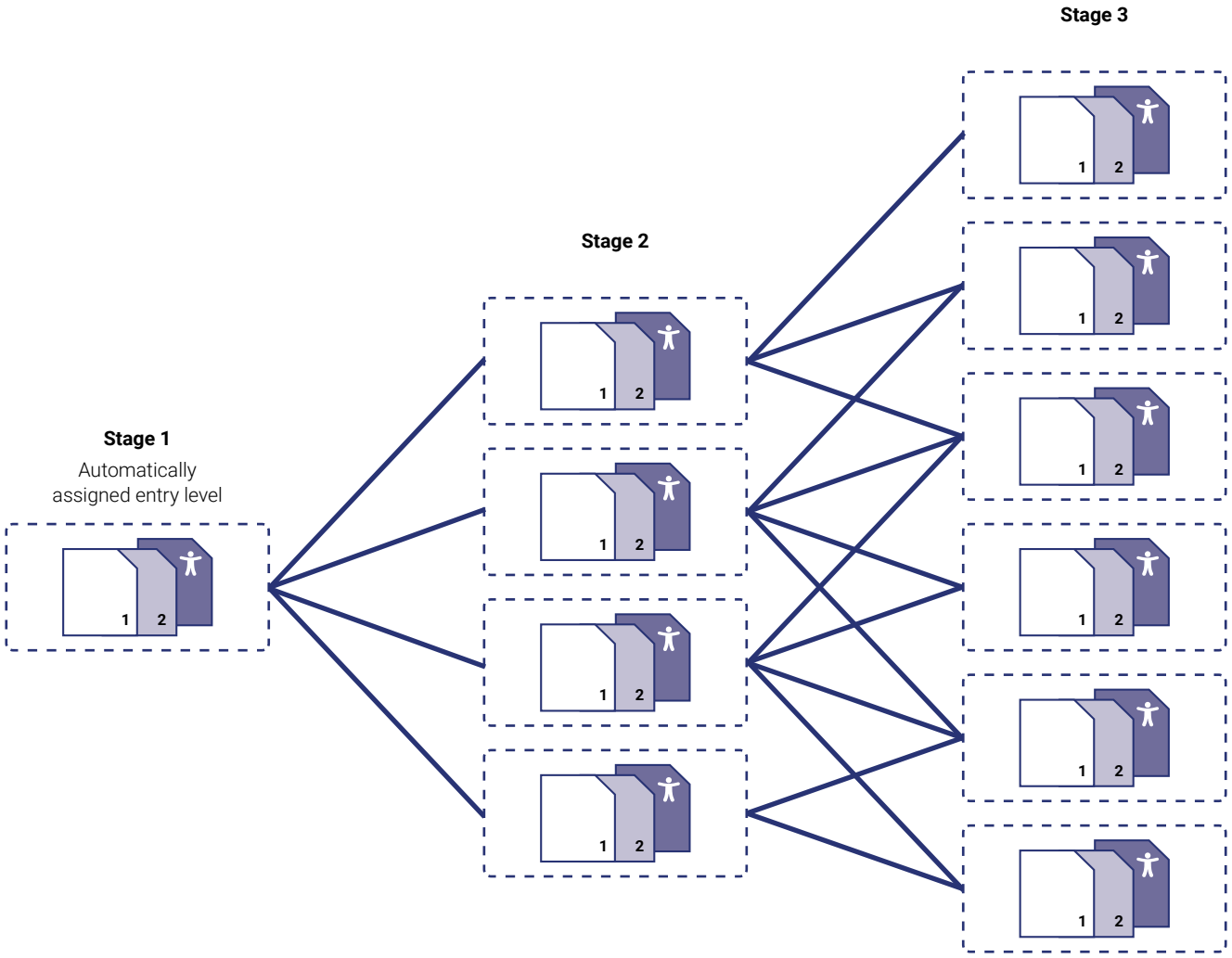
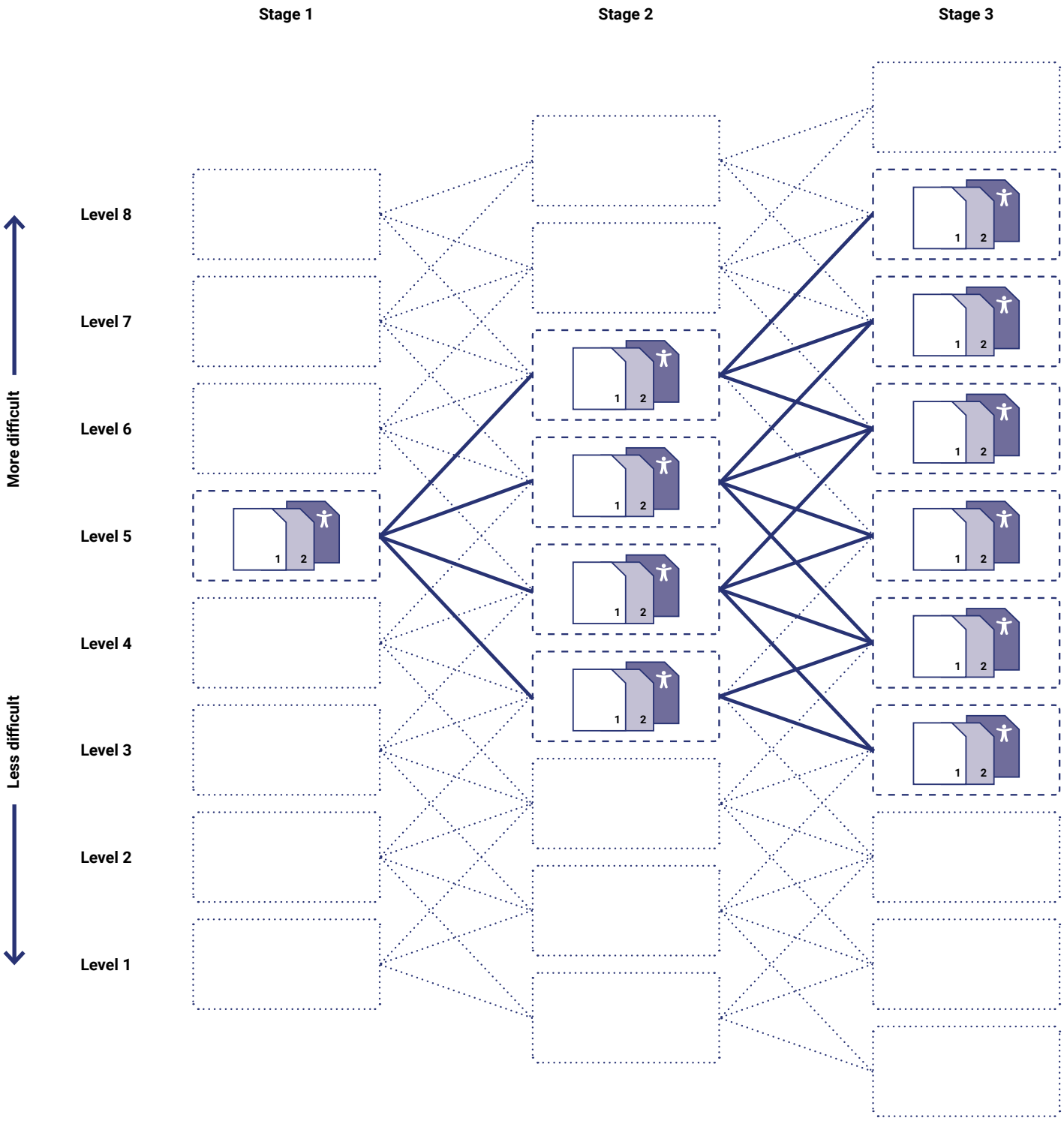


***Figure 2*** *PAT Reading Adaptive test design with eight entry levels*



# Reporting

The information provided by the PAT Reading reports is intended to assist teachers in understanding their students' abilities in Reading, diagnosing gaps, strengths and weaknesses in students' learning, and measuring learning progress over time.

## PAT scale score

A PAT scale score is a numerical value given to a student whose achievement has been measured by completing a PAT assessment. A student's scale score lies at a point somewhere on the specific PAT scale, and it indicates the student's level of achievement in that particular learning area — the higher the scale score, the more able the student.

Regardless of the test level or items administered to students, they will be placed on the same scale for the learning area. This makes it possible to directly compare students' achievement and to observe students' progress within a learning area by comparing their scale scores from multiple testing periods over time.

Item difficulty is a measure of the extent of skills and knowledge required to be successful on the item. This makes it possible to allocate each PAT Reading test item a score on the same scale used to measure student achievement. An item with a high scale score is more difficult for students to answer correctly than a question with a low scale score. It can generally be expected that a student is able to successfully respond to more items whose difficulty is located below their achieved scale score than above. By referencing the difficulty of an item, or a group of items, and the proportion of correct responses by a student or within a group, it may be possible to identify particular items, or types of items, that have challenged students.

A score on the PAT Reading scale has no meaning on the PAT Maths scale. In fact, the units of the scale will have different meanings for each scale. This is because these units are calculated based on the range of student levels of achievement, which vary widely between learning areas.

## Achievement bands

While a scale score indicates a student's achievement level, and can be used to quantitatively track a student's growth, it is only in understanding what the number represents that teachers can successfully inform their practice to support student learning. For this reason, the PAT scale has been divided into achievement bands that include written descriptions of what students are able to do at that band (band description). A student scoring in a particular band can be expected to have some proficiency in that band and be progressively more proficient with the Reading knowledge, skills and understanding outlined in lower bands.

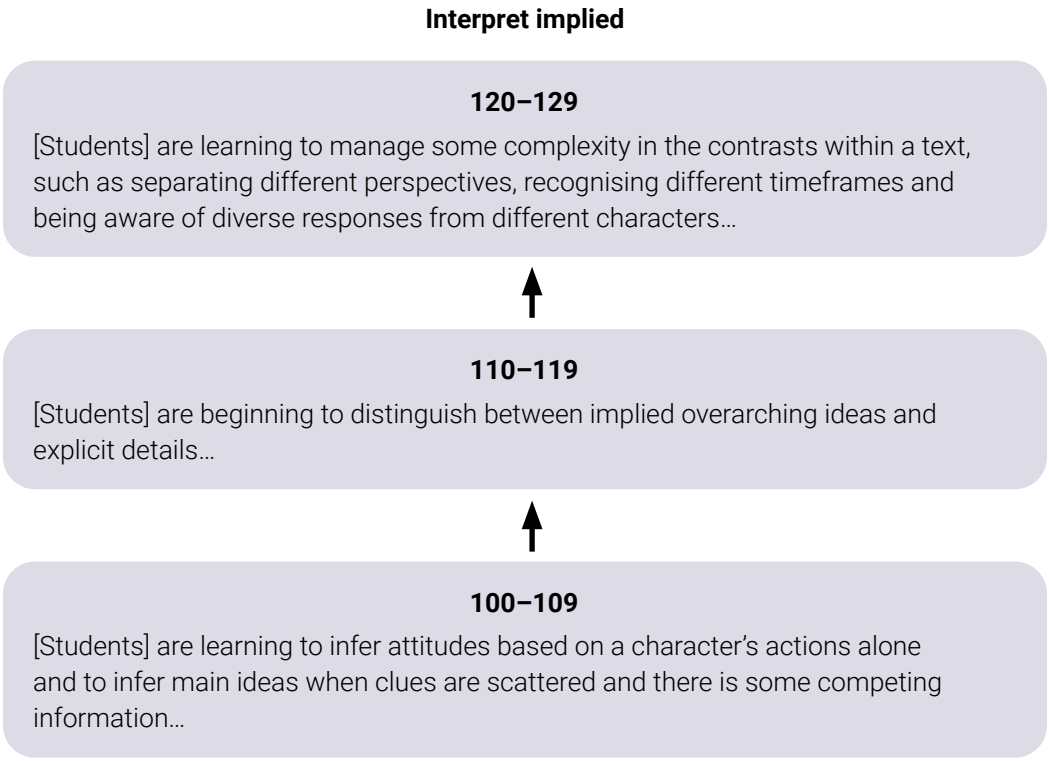
Students in the same achievement band are operating at approximately the same achievement level within a learning area regardless of their school year level.Viewing student achievement in terms of achievement bands may assist teachers to group students of similar abilities. By referencing the PAT achievement band descriptions, teachers can understand the types of skills typical of students according to their PAT band.

A PAT Reading scale score of 110 could be considered to be at the upper end of achievement band 100–109 or at the lower end of achievement band 110–119. In cases like these, it is important to reference the descriptions of both achievement bands to understand the student's abilities.

The achievement band descriptions for PAT Reading are provided in both a summarised form and an elaborated form by strand. The elaborated form can be found within the Help section of the Online Assessment and Reporting System (OARS).

| PAT Reading achievement band description summaries | |
|---|---|
| 150 and above | Students at the top of this band can successfully interrogate complex texts in many different ways. They show accuracy and precision in making fine distinctions in the meaning of words, locate concepts that are deeply embedded in strongly competing information, recognise subtle distinctions between ideas, identify implicit arguments and make sophisticated critical evaluations of texts. |
| 140–149 | Students at the top of this band understand many aspects of complex texts including detailed arguments, dense literary texts with unfamiliar styles and technical texts with unusual diagrams. They interpret detailed reasoning, recognise diverse relationships between ideas and deal with much competing information. They recognise the use of some subtle authorial devices. |
| 130–139 | Students at the top of this band demonstrate a wide variety of comprehension skills. They can unpack ideas in complex sentences, compare multiple sections of texts and link unfamiliar technical information to a diagram. They make comparisons of tone and style, distinguish opinions from actions, recognise the implications of arguments and extrapolate from given points in texts with substantial complexities such as sustained metaphors, or succinct texts with significant implied meaning. The complexity of the text, the student's vocabulary, and the difficulty of the tasks combine to determine the overall difficulty in comprehending the text. |
| 120–129 | Students at the top of this band demonstrate a wide variety of comprehension skills including reading closely to make careful distinctions and identifying subtle, scattered clues to support an inference in texts with a key complex aspect such as unusual diagrams, an extended metaphor, some difficult vocabulary or some long, dense sentences. They can link across sections of the text to make a variety of comparisons, identify subtle, scattered clues to support an inference, reflect on the voice or style and use visualisation to support their interpretations. |
| 110–119 | Students at the top of this band demonstrate a variety of simple comprehension skills where the relevant information is reasonably easy to identify including dealing with some competing information and tracking references. They can read and understand a variety of common text types that include an element of complexity such as an unusual voice, a subtle implication or a non-linear timeline. |
| 100–109 | Students at the top of this band demonstrate a variety of simple comprehension skills such as linking adjacent sections of a text, ordering brief sequences of events, making inferences and reflecting on prominent, familiar features of the text. They can manage low-level competing information They read and understand a range of familiar, common text types that may include slight complexities such as several clearly implied ideas. |
| 90–99 | Students at the top of this band demonstrate a variety of simple comprehension skills that mainly concern prominent information in straightforward texts with familiar ideas and structures, some sentence complexity and a few less familiar words. They can directly match words in longer and more complex texts to retrieve adjacent information. They are unlikely to interpret information that is unexpected or in complex sentences or be able to use the context to interpret the meaning of words they don't know. |
| 80–89 | Students at the top of this band can read and understand prominent ideas and some details in short, simple, explicit texts with a small range of familiar words. They begin to make synonymous matches. They can directly match words in more complex texts to retrieve adjacent information. |
| 70–79 | Students at the top of this band read and understand prominent ideas and make obvious connections in simple unillustrated texts with a few highly familiar words as well as longer texts with supportive illustrations. They mainly use direct word matches to retrieve information. They demonstrate a greater understanding of the text when they can give verbal responses to oral questions. |
| 60–69 | Students at the top of this band can read and understand some simple, text-based, explicit meaning in texts with highly supportive illustrations that they read themselves. They demonstrate a greater understanding of the text when they can give verbal responses to oral questions. |

The example below from the PAT Reading achievement band descriptions illustrates how the descriptions can support teachers' understanding of progression in Reading, and help to inform their teaching practices in a specific and targeted way.




While the achievement band descriptions are intended to be considered in their entirety and not as discrete components, these extracts help to demonstrate the progression of particular skills within a student's ability to make an interpretation. In 'typical' development of Reading ability, students progress from identifying main ideas based on clues across a text, to distinguishing the overarching from explicit detail, to managing a certain level of contrast and differing perspectives. This information helps to inform teachers' learning intentions for students performing at these different levels, to ensure their progression from one level to the next.

# Norms

PAT Reading norm data that represents the achievement of students across Australia is available as a reference sample against which student achievement can be compared. The comparison between a student's scale score achievement and the Australian norms can be expressed as a percentile or stanine ranking.

## Percentiles

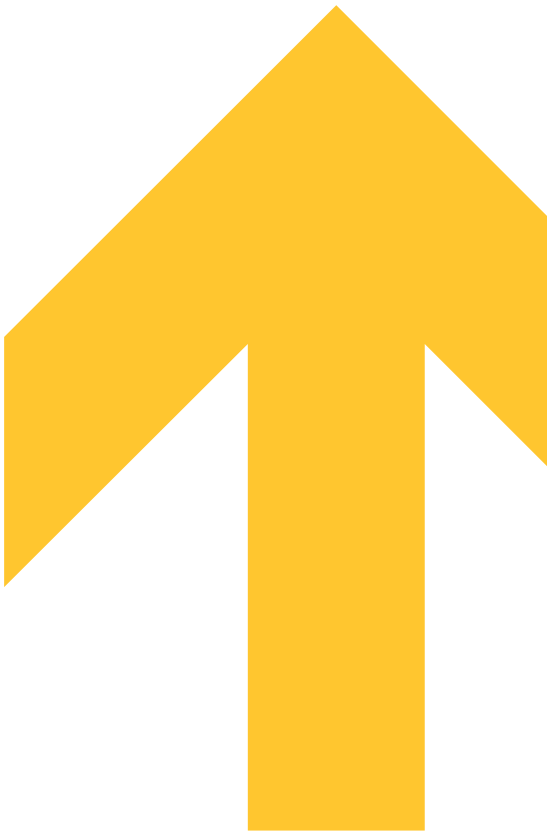
The percentile rank of a score is the percentage of students who achieve less than that score. Percentiles are useful when measuring the performance of a student against the norm for that year level. For example, a student with a percentile rank of 75th compared to the Year 3 norm has a scale score that is higher than 75% of Australian Year 3 students.

## Stanines

Stanines are ranking scores from 1 to 9 derived from the Australian norms. Stanine scores group together percentile ranks to simplify the comparison of student achievement with the norms.

| Stanine | Corresponding percentile ranks |
|---|---|
| 9 | 96th and above |
| 8 | 90th–95th |
| 7 | 77th–89th |
| 6 | 60th–76th |
| 5 | 40th–59th |
| 4 | 23rd–39th |
| 3 | 11th–22nd |
| 2 | 4th–10th |
| 1 | 3rd and below |

Stanines are not reported for *PAT Reading Adaptive* as scale scores are a much more appropriate measure of growth. As scale scores are a measurement of what students can and cannot do, rather than a comparison between students, they are a more effective way to target teaching and learning resources.



# Appendixes

## Appendix 1

### Literature review: locating PAT Reading in the broader research context

Developing students' reading comprehension ability is generally understood as an essential goal of education, and current research recognises the crucial importance of assisting students to make sense of the written text (Förster et al., 2018, p. 98; Callow, 2016, p. 82). Reading comprehension is also acknowledged as a highly complex area of achievement, one that needs to be understood as the coordination of a number of integrated processes. Reading is ideally taught with a forward thinking approach, as reading continues to be important, and the nature of what we read changeable, throughout our lives (Kendeou et al., 2016, p. 63; Conley & Wise, 2018, p. 93; O'Reilly et al., 2014, p. 404). There has been significant research over recent years into the most effective ways to both assess and teach reading comprehension, research that has involved an in-depth consideration of the strategies and processes that most clearly constitute reading (O'Reilly et al., 2014, p. 403; Oakley, 2011, p. 278).

While reading comprehension skills are largely included in the English component of curricula, literacy is more commonly acknowledged as a fundamental skill that crosses over discipline areas. Newman's analysis, for example, makes the comprehension of mathematical problems central to students' ability to apply mathematical strategies. Other research has argued that reading comprehension is essential for deeper learning and development for all general capabilities, such as critical and creative thinking (Kendeou et al., 2016, p. 63).

There is the challenge, in any classroom context, of ensuring that teaching and learning is inclusive of all students at all ranges of ability. Research has emphasised this need for inclusivity and the importance of ensuring that any issues in reading comprehension ability are caught as early as possible. Evidence suggests that students who enter secondary school with a low reading capacity will find it difficult to engage with the material taught in school and are therefore likely to fall further behind. Furthermore, this struggle is likely to continue beyond their education into employment (Woodford, 2016, p. 43; Griffin, 2012, p. 2; Kendeou at al., 2016, p. 63).

Assessment plays an essential role in capturing students' ability levels early in their education with the aim of ensuring that no student is left behind. To support teaching and learning, assessment in reading comprehension should support teachers in understanding the key components that underpin growth (Anderson, 2016, p. 108; Förster et al., 2018, p. 98; O'Reilly et al., 2014, p. 404). The assessment design, therefore, needs to focus on these key components, to separate students based on their acquisition of the skills being assessed, and to support teachers in identifying where students are in their developmental progression, as well as what the next steps are to improvement (Anderson, 2016, p. 108; Förster et al., 2018, p. 98, O'Reilly et al., 2014, p. 404). The assessment also needs to provide valid and reliable information so that teachers can be confident in the data they are using to target areas of learning, and to identify how students progress over time.

There is evidence to suggest that higher student growth in reading comprehension is achieved when teachers have information about their students' reading progress, and using assessment to inform teaching ensures that instruction is timely and appropriate to students' needs (Förster et al., 2018, p. 99; Conley & Wise, 2011, p. 97). As a result, data-driven instructional decisions are increasingly becoming established practice (Griffin, 2012, p. 2). In monitoring students' progress, teachers can identify where there is a need for extra support, adapt instruction as appropriate, and evaluate their approach to teaching the key components more generally (Anderson, 2016, p. 108, Förster et al. 98). While the importance of evidence-based intervention is at the centre of current research, not all types of evidence are the same (Griffin, 2012, pp. 2, 4). It is important that the measurement tool used be aligned with the aims of the intervention (O'Reilly et al., 2014, p. 405). Assessment designers must ensure that the purpose and intended use of the assessment is clear, and that the items, types of texts, or tasks measure this targeted construct (Anderson, 2016, p. 108, Förster et al., 2018, p. 98; O'Reilly et al., 2014, p. 404). Summative evaluation is focused on summarising performance at a particular point in time and subsequently not seen as useful for supporting specific interventions. Formative evaluation, on the other hand, is more focused on providing information that can inform teaching practices and influence intervention (Kendeou et al., 2016, p. 65). Evidence suggests that using standardised assessments formatively requires that tests

contain sufficient information to profile student learning and identify where individual students are in their learning; their 'zone of proximal development' (Griffin, 2012, p. 3). For this data to positively impact teaching and learning, it needs to target the reading processes and strategies that teachers can use for formative evaluation (Kendeou et al., 2016, p. 65). Administering the assessment is never sufficient for informing teaching and improving learning – teachers need to be able to accurately interpret what the data is telling them (Griffin, 2012, p. 3).

It is logical that this more meaningful engagement with assessment, in particular with the support it can provide to teaching and learning in the classroom, has occurred alongside a move towards the explicit teaching of reading comprehension processes and strategies. The past thirty-five years have seen significant research into how reading comprehension might be successfully taught, with evidence indicating that the teaching and learning of cognitive strategies is highly beneficial to reading outcomes. It is not only the teaching of these strategies that has led to these improvements, but the opportunities for their supported practice using a range of texts, and helping students to develop understanding about the appropriate use of these strategies to improve their interaction with texts. Explicit instruction has been shown to be particularly beneficial with adolescent readers who are struggling with deeper or more complex meaning making. Prior to this, reading comprehension was rarely taught explicitly, with an assumption that these skills developed 'naturally' (Oakley, 2011, p. 279; Woodford, 2016 p. 44).

The names and definitions of the components that make up reading comprehension differ, but there has been a notable shift from a simple view of reading to one that attempts to incorporate the various complexities that constitute reading. The simple view presents reading as two main components – decoding and comprehension. The 'situational model' elaborates on the comprehension component by drawing a distinction between what a text is about and the more literal meaning of what it says (text base), highlighting the interaction of reading characteristics, text properties and the demands of the task (Snow et al., 1998, p. 62; Leslie & Caldwell, 2017, p. 220; Kendeou et al., 2016, p. 63). Other models focus on the relationship between the linguistic and cognitive more directly, considering the interaction (and predictive potential) of word decoding, reading fluency, vocabulary knowledge, language comprehension, prior knowledge, comprehension monitoring and working memory (Kendeou et al., 2016, p. 63). The reading process further increases in complexity when viewed in terms of intentional thinking. This is where readers make meaningful connections between all the components referred to above, but also bring to the text their ability to select, apply and evaluate the cognitive strategies of inferring, creating mental imagery, self-monitoring for meaning, clarifying, summarising and predicting, to name a few (Oakley, 2011, p. 280). What these models share is an understanding that reading comprehension is made up of a range of processes involving the construction of a coherent mental representation of the text, and an acknowledgement that this representation can only take place via inference making (Kendeou et al., 2016, p. 63).

What this research amounts to is an appreciation that there is no one way to assess, teach or learn how to comprehend a text, and that, while measurement tools are essential to the identification and targeting of student learning, no one tool is sufficient for the task alone. The content of an assessment, if designed successfully, can encompass a wide variety of the processes common to reading but can only ever represent a sample from a larger design space (O'Reilly et al., 2014, p. 404). This realisation does not negate the importance of evidence-based teaching practices. Considering the complexities of the act of reading, having a valid and reliable summation of student achievement that exemplifies the journey towards proficiency (a journey that never really ends) is all the more important. Gonski highlights this in his Report (2.0) with several references to the usefulness of evidence-based learning progressions in setting performance expectations, understanding and reporting progress, informing teaching and learning and promoting educator professional development (Gonski et al. 2.0 2018).

Part of understanding and reporting progress means enacting effective and ongoing classroom based assessments that can consider progress both over time and in multiple contexts (Oakley, 2011, pp. 280–1). As Conley and Wise (2018, p. 97) have stated, 'assessment opportunities for comprehension are everywhere'. Descriptions of progression are valuable tools for the design and monitoring of ongoing formative assessment in the classroom, and can be used in feedback to both students and parents or carers as appropriate. They can also promote collaboration between teachers through the process of interpreting assessment data and meaningful discussion that uses a shared terminology. This collaboration is relevant to reading, in particular, as it marks the intersection of all subjects and, at secondary level especially, should be evaluated in consultation with colleagues. Clearly communicated assessment information, such as a described progression, can also help teachers better understand their own practice and its effect on student achievement (Griffin, 2012, p. 3).

Descriptions of progression provide a clear indication of the cognitive skills, processes and strategies targeted by the assessment and can serve as a springboard from which further investigation can take place. They should not be seen as an all-encompassing representation of the cognitive skills relating to a particular domain, but as an evidence-based description of 'typical' progression that serves as a starting point for teachers to work from. They should also be living documents that, in unison with the assessments they accompany, are capable of incorporating new ideas and understandings as they come to light.

One of these more recent areas of research concerns the interaction between image and text that, while a component of many reading assessments, is perhaps yet to be fully understood in its complexity and importance (Unsworth, 2014, p. 27; Callow, 2016, p. 82). Another area is that of reading contexts and the role they play in the acquisition of meaning (Wixson, 2017, pp. 77–78). As these studies continue, assessment practices must investigate successful ways of accommodating these new findings, continuing to provide teachers with evidence that is as representative as possible of the rich complexity of integrated processes that constitute reading.

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# Appendix 2

## Trial design and assessment validity

A test is said to be valid if it measures what it was intended to measure. The PAT Reading tests are planned and constructed to assess reading comprehension skills that are commonly accepted as important by expert teachers of Reading. In constructing the tests, care is taken to include a range of text types and skill areas to ensure that the breadth of students' reading comprehension abilities are being captured. All the items are subjected to intensive scrutiny, review and revision by panels of experts.

All items are developed by a group of experienced test developers specialising in Reading, who review and panel the items until they are ready for trial. A rigorous process of quality checking, proof-reading and formatting then takes place. The psychometric team provides a trial design based on the items (number, distribution of stand and text type etc.) To ensure the most valid and reliable psychometric data is made available, PAT Reading items are currently trialled in standalone trial test forms with sets of items placed into different locations in multiple versions of a single form. Schools using any of ACER's online PAT assessments opt for their students to participate in the PAT Reading test trials. Data analysis is performed after trial by the psychometric team, with the Test Development Manager making final decisions about item performance and deletions.

Each trial is designed to strengthen the PAT Reading construct, ensuring a spread of items along the PAT scale that meets the demands of strand and text type distribution. Trials are also regularly conducted to ensure that the test material is refreshed with contemporary themes and formats that reflect current day reading practices. Trials also provide an opportunity to ensure continual improvement in the representation of groups and cultures through the reading texts. In Australia, this includes urban and rural communities, and most recently Indigenous culture and voices. The issue of representation is something the PAT Reading team continues to work on.

In the course of selecting testlets for *PAT Reading Adaptive*, the best-performing material was retained from previous editions of the tests, including *PAT Reading 5th Edition*. New passages and items were trialled for *PAT Reading Adaptive* and the best-performing new material from the trial was selected.

The calibration procedures identified items that also appeared to be measuring skills other than those measured by the majority of items. Items 'misfitting' in this way were not retained. The items retained for *PAT Reading Adaptive* were shown to fit the Rasch measurement model satisfactorily. All PAT Reading items could be regarded as measuring a student's location on a single underlying continuum of reading comprehension skills.

PAT Reading items have been trialled across many years, with only successfully performing items becoming part of the PAT Reading item pool for selection in final linear forms and adaptive testlets.

Further evidence of the validity of the PAT Reading assessments is provided by the correlation between the comprehension test and other tests of reading comprehension in use when the PAT Reading assessments were first made available. Refer to *Progressive Achievement Tests in Reading: Comprehension, Vocabulary and Spelling, Fourth Edition* (Stephanou, Anderson & Urbach, 2007). The evidence supports the intention that the tests would largely be measuring the same (or very similar) skills.

# Appendix 3

## PAT Reading item response format examples

These examples illustrate three commonly used item response formats used in PAT Reading assessments: simple multiple-choice, complex multiple-choice, and drag-and drop.

The example items share a text, shown below.

Clicking the linked quotation in the first item highlights the relevant section within the text.

'*He told them that he had grown enormous vegetables.*'

What does enormous mean?

- ○ juicy
- ○ large
- ○ green
- ○ fresh

Put the events in the order they happen.

**First**

Mr McLeod says his turnips are the size of footballs.

Mr McLeod asks his neighbours to come over.

Mr McLeod says he has grown enormous vegetables.

**Last**

Does Mr McLeod say the following statements to his neighbours?

Select 'Yes' or 'No' for **each** statement.

| Statement | Yes | No |
|---|---|---|
| He had grown enormous vegetables. | ○ | ○ |
| The marrows were as big as logs. | ○ | ○ |
| He loves to eat his vegetables. | ○ | ○ |

Mr McLeod asked his neighbours to come and see his garden.

He told them that he had grown enormous vegetables.

He said the turnips were the size of footballs and the marrows were as big as logs.

This photograph was taken in 2016.