United Nations
Educational, Scientific and
Cultural Organization

UNESCO INSTITUTE FOR STATISTICS

GLOBAL ALLIANCE TO MONITOR LEARNING

SUSTAINABLE DEVELOPMENT GOALS

MINIMUM PROFICIENCY LEVELS

Described, unpacked and illustrated

GAML6/REF/2

SDG Goal 4.1, Indicator 4.1.1

MINIMUM PROFICIENCY LEVELS

Described, unpacked and illustrated

Version 2

July 2019

The ACER Centre for Global Education Monitoring supports the monitoring of educational outcomes worldwide, holding the view that the systematic and strategic collection of data on education outcomes, and factors related to those outcomes, is required to inform high quality policy aimed at improving educational progress for all learners.

This paper was developed as a contribution by ACER-GEM in support of the UIS-led Global Alliance for the Monitoring of Learning (GAML).

Contents

1. Introduction

This document draws together work from several initiatives to establish Minimum Proficiency Levels (MPLs) for mathematics and reading, for global use in pursuit of the Sustainable Development Goal in Education, SDG 4.1: -

By 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes

More specifically it focuses on indicator 4.1.1:

Proportion of children and young people: (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex

Central to the establishment of MPLs is the work of UIS, as a custodian agency for reporting against the Sustainable Development Goals in Education. UIS's role is to develop standards, methodology and guidelines to enable countries to report on the SDG education goals and indicators.

UIS's work resulted, in late 2018, in international expert consensus on draft MPLs for three stages of children's and young people's education: lower primary (4.1.1a), end of primary (4.1.1b) and end of lower secondary (4.1.1c). This was published in *Final Report of the Results of the Consensus Building Meeting on Proficiency Levels* (Nitko, 2018).

Work was commissioned and has continued since then on reviewing and refining the draft MPLs. This paper is offered as part of that process. Among multiple research efforts and discussions that have shaped the recommendations contained here, three deserve particular mention.

First, UNESCO's International Bureau of Education (IBE–UNESCO) commissioned audits of national curriculum and assessment frameworks for reading and mathematics, spanning countries worldwide. The initial input to these audits was provided by consultants Ariel Cuadro, Carola Ruiz and Ana Palombo for reading, and Malcolm Cunningham for mathematics. The output in each case was the IBE Curriculum and Assessment Frameworks (2019), a comprehensive set of categories listing sub-domains, constructs and sub-constructs that were identified as being in widespread use across the curricula and assessments included in the audits.

Second, in early 2019 the Australian Council for Educational Research (ACER), as technical partner to UIS, conducted a review of the MPLs that had been drafted in late 2018 (ACER, 2019c). The purpose of the review was to check consistency of approach to definitions of reading and mathematics proficiency; review the text of the MPLs and suggest refinements where required. ACER also mapped the draft MPLs to its learning progressions (ACER LPs), which had been constructed over a period of several years by empirically calibrating and synthesising assessment material from multiple sources. As a result of this mapping it was possible to provide illustrative assessment material to support the MPLs.

Third, the Global Reading Network and its central technical collaborator, Management Systems International (MSI), supported by USAID and UIS, organised two week-long workshops in April and May 2019, to develop Performance Level Descriptors for primary grades from Grade 2 to Grade 6 in reading and mathematics. These were called 'policy linking workshops', as their aim was to underpin a methodology for linking assessments across countries and for linking national assessments to global benchmarks. USAID is exploring policy linking as a practical and non-statistical method for linking student assessments both within and across countries. Starting with the UIS's draft MPLs, the panels of international Subject Matter Experts who developed the Performance Level Descriptors drew substantially on the work of the IBE-UNESCO audits, to define the areas of mathematics and reading that set the framework for the elaboration of MPLs. They also referred to the ACER LPs, with their elaborated descriptions of progressive levels of development in reading and mathematics levels, and alignment with the MPLs. The drafts of the outputs of these meetings, available as at July 16 2019, are *Grade 2 to 6 Reading Draft Performance Level Descriptors* (USAID/UIS, 2019b) and Grade 2 to 6 Math Draft Performance Level Descriptors (USAID/UIS, 2019a)

Using the late 2018 UIS MPLs for reading and mathematics as the critical starting point, this document presents revised summary statements of the MPLs at two levels of detail; and descriptions of strands or sub-domains that further elaborate the meaning and intent of the MPLs. It also includes a small sample of assessment tasks to illustrate and give more concrete substance to the MPLs.

2. Clarification of terms

The multiple contributions to defining and developing MPLs have generated a plethora of terminology, often with the same term used for different meanings or multiple terms used to designate the same thing. This section recommends a shared set of terms to support shared understanding.

Terminology used to distinguish the hierarchy of descriptions representing the MPLs

The terms used to designate learning areas and subsets of learning areas differ across curricula, assessments and programs. For example, PISA calls reading and mathematics 'domains'; TIMSS and PIRLS call subsets of reading and mathematics 'content domains'. In the IBE Curriculum and Assessment Frameworks, 'reading' ('reading competency') is called a domain, but its audit of mathematics uses the term 'domains' for 'number knowledge' and 'measurement' domains, as well as for 'mathematics proficiency'. This mixture of terms is likely to cause confusion and misunderstanding.

It is recommended that a consistent set of terms be adopted for describing classifications in the context of MPLs.

The set of terms proposed is a slightly modified version of that used in the IBE Curriculum and Assessment Frameworks (International Bureau of Education - UNESCO, 2019): learning area, domain, construct and descriptor.[1] The terminology of domain and construct is also consistent with that used in the USAID/UIS Performance Level Descriptors (USAID/UIS, 2019b).

The proposed hierarchy of terms is set out in **Error! Reference source not found.**, in ascending order of granularity.

Table 1 Recommended terminology for the hierarchy of classifications representing the MPLs

Learning areas	**Reading**	**Mathematics**
Domains	Decoding Reading comprehension Aural language comprehension	Number knowledge Measurement Statistics and probability Geometry Algebra

[1] The IBE Curriculum and Assessment Frameworks also use a more fine-grained division of constructs, 'sub-constructs'. This level of classification is however not used in the current set of recommendations.

Learning areas	**Reading**	**Mathematics**
Constructs	Precision Fluency Retrieving information Interpreting information Reflecting on information	Number sense Operations Real world problems Fractions Decimals Exponents Measurement units Area, perimeter and volume Time Currency Data management Chance and probability Properties Constructions Position and direction Angles Cartesian plane Patterns Relations and functions Variation
Descriptor	*For example:* Read words accurately Understand the meaning of words in text read aloud Make inferences by relating prominent piece of information to identify behaviours, feelings and events Establish connections between main ideas and personal knowledge	*For example:* Count, read, write, compare and order whole numbers up to 30 Tell time using analogue clock to the nearest half hour Compare probabilities of simple events Solve problems involving ratios, proportions, and percentages

Error! Reference source not found. shows that the *learning area* of Reading has three *domains* (Decoding, Reading comprehension and Aural language comprehension,) and the *learning area* of Mathematics has five *domains* (Number knowledge, Measurement, Statistics and probability, Geometry and Algebra). Within each domain there are several *constructs* (for example, Decoding has the constructs of Precision and Fluency). The *descriptors* (the last row in **Error! Reference source not found.**) represent the skills, knowledge and understandings that apply to a specific level of proficiency – that is, a specific MPL. To summarise, the learning areas, domains and

constructs apply (generally) across a continuum of learning (to all the MPLs), while the descriptors apply to a specific part of the continuum (only one MPL: for example, end of primary).

One further clarification of terminology concerns the abbreviation 'PLD'. In the *Final Report of the Results of the Consensus Building Meeting on Proficiency Levels* (Nitko, 2018) PLDs are explained as the *Proficiency* Level Descriptors 'of cross-national, regional and community-led tests in mathematics and reading' (p. 8), which were compared and mapped to result in definition of the draft MPLs. Later in the same paper PLDs are defined as '*Performance* Level Descriptors': 'skills and/or processes that are associated with test takers who achieve that performance level' (Nitko, 2018). It can be inferred that Proficiency Level Descriptors are higher level descriptions, a synthesis of two or more Performance Level Descriptors. While this is intelligible, papers from the policy level meetings in April and May 2019 conflate all levels of classification as 'Performance Level Descriptors' (for example, see USAID/UIS, 2019b).

It is recommended that the abbreviation PLD be reserved for the high-level Proficiency Level Descriptors that summarise levels of attainment in various cross-national, regional and community–led tests. It is recommended that other descriptions, at various levels of detail, are referred to using the classification terminology shown in Error! Reference source not found.**.**

Terminology and definitions used in reading and mathematics MPLs

The papers from the UIS consensus building meetings included a set of terms to help clarify the meaning of the draft MPLs (Nitko, 2018). An additional glossary was developed for the policy level workshops' Performance Level Descriptors for reading (USAID/UIS, 2019b). A selection of terms and definitions from these two sources, with slight modifications, is provided below, as used in the current document.

Reading

- Accuracy/Precision (in decoding): Correct recognition of the phonological form of a word based on its orthographic form
- Author´s intentions: may include the author´s choices (literary resources, title, words, etc.); the author´s feelings or motivations when/for writing, the author´s aim when writing, the author´s intentions when sharing a text in social media or publishing online
- Continuous texts: texts formed by sentences formed into paragraphs
- Draw conclusions: Generate conclusions from a text; generate conclusions about a topic considering different sources of information; generate conclusions about a character´s motivations or intentions
- Explicit information: information that is presented in the text
- Familiar words: words that are part of the students' vocabulary and that have been read before more than once
- Fluency (in decoding): Presupposes accuracy and speed in word recognition. It can also include qualities such as volume (reading at a volume that is adequate to the

instructions given or the audience), pace (adjusting the pace to the instructions, to improve precision or comprehension), expressiveness and tone (adjusting it to the audience' characteristics, to the content and the characters)

- General knowledge: previous knowledge that the student has in reference to everyday life and world affairs
- Interpret: Extract and recognise implicit and explicit information from a written sentence or text to relate it with other information or apply it to new situations or problem solving
- Morphological clues: Clues contained in the morphological elements of word (root word, suffixes, prefixes, infixes
- Non-continuous texts: texts not in paragraph form, such as lists, tables, graphs, diagrams, indexes and forms
- Overall meaning of a text or sentence: refers to the most relevant information of the text
- Paratextual features: Features that are added to a text that can change or help the interpretation of the text. These include headings, subheadings, textboxes, illustrations, diagrams, graphs, fonts
- Prosody: The rhythm and intonation of language
- Reflect: Critically analyse and give an opinion about the information presented in a written sentence or text and the consequences the information may have
- Short texts: texts that are between 60-80 words in length
- Text types: narrative, descriptive, expository, procedural, which may be in continuous or non-continuous format
- Topic of a text: an identified theme or subject

Mathematics

- Algebraic representations: examples include expressions, equations, and inequalities, all of which contain one or more variables.
- Application problems: also known as "word problems" or "story problems", these are problems that are presented in context, without explicitly telling students which mathematical operation(s) to use.
- Computation: math problems presented without context, in arithmetic form, such as 38 + 67 or 23 x 92.
- Number sense: skills such as reading, writing, comparing, ordering and estimating numbers.

- Spatial orientation: position and direction on a diagram, map, or graph, often described by words such as “above”, “below”, “left”, “right”, “inside”, “outside”, etc.

3. Addressing the challenge of interpreting Indicator 4.1.1

Indicator 4.1.1 is described in terms of three educational levels: 'in Grade 2/3 (4.1.1a); at the end of primary education (4.1.1b); and at the end of lower secondary education (4.1.1c).' Even in this statement, four rather than three educational levels are mentioned (Grade 2, Grade 3, end of primary and end of lower secondary). In the consensus arrived at in the meeting of late 2018, the 'three educational levels' had evolved into descriptions that reference six grade levels: Grade 2, Grade 3, Grade 4, Grade 6, Grade 8 and Grade 9. This constitutes a logical and practical dilemma.

The confusion has developed because of variation in educational systems, practices and conditions across the globe. In lower primary (Grade 2 and Grade 3), different linguistic conditions affecting education and different practices in early grade measures of reading and mathematics, are in play. For the second group, 'end of primary education', a further issue is that the number of years in primary education varies across countries: primary school may be anywhere from four years of schooling to eight years of schooling, as cited by Gustafsson (Gustafsson, 2019, p. 14). By extension, depending on when primary education ends, the 'end of lower secondary' could be interpreted as anything from six to ten years of schooling.

While the multiplication of grade references may satisfy the wish for flexibility in interpretation for stakeholders, it confounds the need for equity and comparability across the globe, not to mention international confidence, in reporting attainment against indicator 4.1.1. A further complicating factor in the attempt to merge or align grade levels is that the rate of growth in learning varies across the years of schooling, with the most rapid development in the early years. Accordingly, the most problematic of the 'three educational levels' from the point of view of agreeing Minimum Proficiency Levels is the lowest, Grade 2/3. In reading particularly there is a very substantial gap between what can be expected from children at the end of Grade 2 and at the end of Grade 3. It can be seen in the version of the MPLs emerging from GAML meetings at the end of 2018 that this issue was dealt with differently by reading and mathematics experts. Reading presented separate MPLs for Grade 2 and Grade 3, whereas mathematics reached a combined 'Grade 2/3' MPL. This variation in approaches in itself may be hard to explain in the context of global discussions.

Turning to the 'end of primary' Minimum Proficiency Level, both reading and mathematics experts at the last GAML meeting arrived at a single short MPL description, labelled 'Grades 4 & 6'. However, when these descriptions are elaborated in the form of descriptors of skills, processes, knowledge and understanding – as evidenced by the Grade level descriptors in the USAID/UIS Policy Linking meeting – it can be observed that there are marked differences in the descriptions of minimum proficiency level expectations for Grade 4 and Grade 6. The USAID/UIS documents also propose distinct MPLs for Grade 5 (USAID/UIS, 2019a, 2019b)

Finally, the 'end of lower secondary' was defined by the last GAML meeting as 'Grades 8 &9'. This pairing is less problematic substantively. Research evidence shows that, in general, learning progression slows as students advance through school. The difference between Grades 8 and 9 proficiency is certainly not as sharp as that between Grade 2 and Grade 3, nor that between

Grade 4 and Grade 6. However, for consistency with the other two MPLs, a single level representing 'end of lower secondary' would be preferable.

It is recommended that a single MPL be presented for each learning area and each of the three educational levels addressed by SDG 4.1. Where MPLs have been linked to more than one specified grade level, the lowest of these should be adopted as the single MPL.

The rationale for this approach is that MPLs are, by definition, MINIMUM proficiency levels, so that the lowest level identified by consensus is the logical locus for the MPL. Advantages of this approach are:

- Intelligibility for stakeholders;
- Fairness and comparability across countries;
- Consistency between mathematics and reading;

The lower primary level (referred to in 4.1.1a as 'Grade 2/3') should be understood as equivalent to the end of the third year of school – which, in some countries (where there is a preparatory year of school, called variously 'reception', 'kindergarten', 'prep', etc.) is called Grade 2, and in others (where there is no preparatory year) is called Grade 3. One reason for this recommendation is that it would mitigate any discouragement that stakeholders (such as teachers) might experience if the content of MPLs is too aspirational. Another is that in many countries in which the language of instruction is not children's first language, instruction takes place exclusively or largely in children's mother tongue for the first three years of school, the transition to the formal language of instruction made thereafter. This makes the end of the third year of school a logical time for taking a measure of reading proficiency 'at the end of lower primary'.

It may be left to the discretion of countries to apply the MPL to a grade level higher than that specified eg the lower primary MPL may be aligned with an assessment administered to children in their third or fourth year of school, because of particular circumstances. Gustafsson recommends that 'There would be some guidance and parameters relating to the correspondence between grade and the three education levels, but within these parameters countries would have some leeway in determining whether, say, a Grade 4 assessment should be counted under (a) or (b). Gustafsson further suggests that a countries 'should be required to state its reasons for any choices made.' (Gustafsson, 2019, p. 55)

The three educational levels are referred to henceforth in this paper as 'end of lower primary', 'end of primary' and 'end of lower secondary'.

4. Unpacking the MPLs

The remaining part of this paper presents recommendations for the MPLs, first for reading and then for mathematics, for the three educational levels. The MPLs are described and elaborated in four ways: nutshell statements, expanded statements, descriptors by construct, and sample items.

The first and briefest version is a *nutshell statement* about each learning area by educational level, intended for the general reader. The level of detail in these nutshell statements is similar to that of the draft MPLs published in *Final Report of the Results of the Consensus Building Meeting on Proficiency Levels* (Nitko, 2018). For ease of reference, the Appendix contains a table showing the comparison between these consensual draft MPLs, and the current nutshell statements.

The second version is an *expanded statement*, still a summary but a more detailed one, using language that is likely to be familiar to those working in the field of education, whether at national policy or local level.

The *descriptors*, the third version, are elaborated by construct for each educational level. These use more technical language, and will be useful for educators and researchers – for example, those involved in policy linking or other methodologies to align MPLs with national evidence.

Finally the fourth version is a small set of sample items giving a more concrete indication of the degree of challenge intended for each MPL.

While MPL statements – both nutshell and expanded versions – are much briefer than the descriptors, it is intended that references to the constructs for each learning area are still evident even in these more concentrated versions.

5. Reading

End of lower primary

Nutshell statement

Students read aloud and comprehend many single written words, particularly familiar ones, and extract explicit information from sentences. They make simple inferences when longer texts are read aloud to them.

Expanded statement

In a short simple text of one or two sentences, learners read aloud most words – including some unfamiliar words – accurately but slowly and often word by word. They identify the meaning of familiar words, including when they have morphological changes. They retrieve explicit information from a single sentence. When listening to longer texts, and looking at the illustrations, learners retrieve explicit information about main events, ideas or characters and use that information to draw simple inferences. They identify the meaning of familiar words and some unfamiliar words.

Constructs and Descriptors

Decoding

In a short and simple connected text of one or two sentences, decode most words, including some unfamiliar words.

Reading comprehension

Retrieving information

Identify the meaning of familiar words in a sentence, including when they are used in unfamiliar ways.

Locate most pieces of explicit information in a sentence when the information is prominent and there is no competing information.

Aural language comprehension

Retrieving information

In a longer text that is read aloud to them, identify key events, ideas and major characters.

Interpreting information

In a longer text that is read aloud to them, make simple inferences and identify the meaning of key words

Sample items for end of lower primary

Example 1

Skill Illustration: Directly match words

Marta had a pen, Jay had a book and Diri had a ball. Who had a book? ○ Marta ○ Jay ○ Diri	Lili and Mum went to the shops and Mirka stayed at home. Who stayed at home? ○ Lili ○ Mum ○ Mirka	Vijay has a red hat, a blue coat and yellow socks. What colour is the hat? ○ red ○ blue ○ yellow

Target reading construct: Retrieving information

Target Reading Strand: Retrieving

Target Skill: Locate information adjacent to the matched word in a compound sentence.

Explanation

Students can match key words from the question to a sentence and locate the answer in the adjacent words. They can match words without knowing what all the words mean. Understanding syntax helps students to work out if the required information is likely to be before or after the matched words even if they do not know what some of the words mean.

Example 2

NOTE: Developing one's skill in actively and attentively listening to texts that are read aloud is a precursor to reading comprehension. Prior to the point at which learners can read independently, learners are able to understand texts of greater complexity when they are read aloud to them compared to when they read for themselves The following is an example of a text which would be read aloud to students at this level (that is, they would not read this text themselves).

Skill Illustration: Link information

Chiumbo and the goats

Every day Chiumbo took the goats out to find new grass. At night he brought them home again. Every day was the same.

One day Chiumbo was so bored that he fell asleep. The goats started walking off down the road, but an old man saw them. He brought the goats back and woke Chiumbo up. "Thank you old man," said Chiumbo.

The next day Chiumbo fell asleep again. An eagle saw Chiumbo and flew down hoping to have baby goat for dinner, but all the other birds made so much noise they woke Chiumbo.

"Thank you birds," said Chiumbo as he waved a big stick to frighten the eagle away. "This is good," said Chiumbo, "I can sleep every day."

The next day Chiumbo was asleep in the grass when a thief crept up and stole two of Chiumbo's goats. When Chiumbo finally woke up, he searched and searched but he could not find the missing goats. Chiumbo was very frightened.

When he got home, his father was waiting. Chiumbo told his father the truth straight away and said that he was very sorry.

"Have you learned your lesson now?" his father said angrily. Then he added, "You are a very lucky boy. A policeman caught the thief and so we've got our two goats back."

And after that, Chiumbo became the best goat minder in the village.

Question: Why did Chiumbo think he could sleep every day?
Answer: He thought someone else would look after the goats/the old man would help/the birds would wake him up

Target reading construct: Interpreting information

Target Skill: Link multiple pieces of aural information to draw inferences about behaviour

---

Explanation

Students listen to the story and link the first two events of the old man returning the goats and the birds waking Chiumbo to infer that Chiumbo now thinks this will happen every time where someone, or something else will take care of the goats for him.

Reading: End of primary

Nutshell statement

Students independently and fluently read simple, short narrative and expository texts. They locate explicitly-stated information. They interpret and give some explanations about the key ideas in these texts. They provide simple, personal opinions or judgements about the information, events and characters in a text.

Expanded statement

In a short, simple narrative or expository text, learners read aloud at a pace and a level of accuracy that demonstrates understanding. They use previously-taught morphological (word-level) and contextual (sentence or text level) clues to understand the meaning of familiar and unfamiliar words and to distinguish between the meanings of closely-related words. When reading silently or aloud, they locate explicit information in a paragraph. They use that information to make inferences about behaviours, events or feelings. They identify the main idea of a text if it is prominently stated and recognise common text types when the content and structure are obvious. They make basic connections between the text and their personal experience or knowledge.

Constructs and Descriptors

Decoding

In a short, simple narrative or expository text, read at a pace and with a level of accuracy and prosody that meets minimum standards for fluency in the language of instruction.

Reading comprehension

Retrieving information

Use morphological or contextual clues to identify the meaning of most unfamiliar words, familiar words used in unfamiliar ways, different shades of meaning of closely related words, synonyms or basic figurative language.

Locate most pieces of explicit information when the information is prominent and found within a single paragraph containing no competing information.

Interpreting information

Establish the main idea of a text most of the time, when it is stated prominently in the text

Make simple inferences by relating two or more prominent pieces of explicitly stated information, when there no competing information, in order to identify most behaviours, feelings, events and factual information.

Reflecting on information

Establish basic connections between the key ideas in a text and personal knowledge and experience.

Distinguish between text types (narrative and expository) and recognise some other common text types (for example, poetry, recipe, game instructions.) when the content and structural clues are obvious.

Sample items for end of primary

Example 1

Skill Illustration: Link pieces of related information

The Dwarf Lantern Shark

Are you afraid of sharks?

Some sharks are harmless. The Dwarf Lantern Shark cannot hurt you. It is so small you can hold it in one hand. It is a special shark because it can glow in the dark.

The Dwarf Lantern Shark lives at the bottom of very deep oceans. There is no light where they live. They make their own light.

Question: Why does the Dwarf Lantern Shark need to glow in the dark?

Target reading construct: Interpreting information

Target Skill: Link information from the end of one paragraph to the beginning of the next paragraph.

Explanation

Students can link information across paragraphs when the information follows from the end of one paragraph to the start of the next paragraph. In 'The Dwarf Lantern Shark', students need to link the information about the shark glowing in the dark to the information about living in deep oceans where there is no light to understand why they make their own light.

Example 2

The Story

Sassoon had written a story. It was on top of his desk. Marco walked by, picked up the story and started to read it.

'Give it back to me,' Sassoon yelled.

'I just want to read the story,' Marco said. He held it up high.

'No, it's private. I don't want anyone to read it', said Sassoon. He tried to grab it back.

A teacher came into the room. 'What are you two doing?' she said.

Questions

How do you think Sassoon feels at the end? (angry/embarrassed)

What is the teacher probably going to do? (give the story back, tell the boys off)

What do you think about what Marco did? (He was mean/not nice. If he wants to look he should ask first.)

Target reading construct: Reflecting on information

Target Reading Strand: Reflecting

Target Skill: Provide simple, personal judgements about behaviour or make predictions

---

Explanation

Students can make simple predictions about the likely outcomes of familiar situations based on their everyday knowledge. In 'The Story', Marco is clearly provoking Sassoon by reading his story without his permission. Students can predict how Sassoon is likely to be feeling. They can predict that the teacher who comes is likely to try to stop the students from fighting. They can also support an opinion about Marco's behaviour. This text is very short and simple, and the content is highly familiar so it does not require further support from illustrations at this level.

Students need to read the text themselves and then give an oral response to oral questions rather than responding to written questions.

Reading: End of lower secondary

Nutshell statement

Students locate and connect multiple pieces of related information across sections of texts to understand key ideas. They make straightforward inferences when there is some competing information. They reflect and draw conclusions based on evidence, in a variety of text types.

Expanded statement

In a range of continuous and non-continuous texts, including narrative, expository, descriptive, argumentative, instructional, and transactional texts, students locate multiple pieces of information across a text, including information in paratextual elements. They make simple inferences drawing on prominent information to summarise key ideas, and select evidence to support an interpretation. They reflect on texts in relation to personal experience and draw on general knowledge to identify if there is an obvious flaw in a text-based idea.

Constructs and Descriptors

Reading comprehension

Retrieving information

Locate multiple pieces of related information that are dispersed throughout a text with familiar structures when there is some similar information nearby. They make inferences, drawing on prominent information

Locate paratextual information in continuous and non-continuous texts (eg footnotes in continuous texts; legends in maps).

Interpreting information

Connect pieces of related information across multiple sections of a text, including when ideas are well-separated and there is competing information, in order to understand less prominent ideas.

Sequence events when there are overlapping timelines.

Make inferences, drawing on obvious clues or prominent information, to summarise main ideas in paragraphs or across entire texts when there is some competing information.

Select evidence from a text, including obvious tone, to support an interpretation (eg a simple comparison of two characters or two events).

Apply information from the text to new examples (eg classifying new items according to a described scheme).

Reflecting on information

Provide an example of how a text relates to personal experience.

Draw on external knowledge to identify an obvious flaw in an idea or to make a prediction.

Recognise different text types when they have familiar styles, language or text layouts.

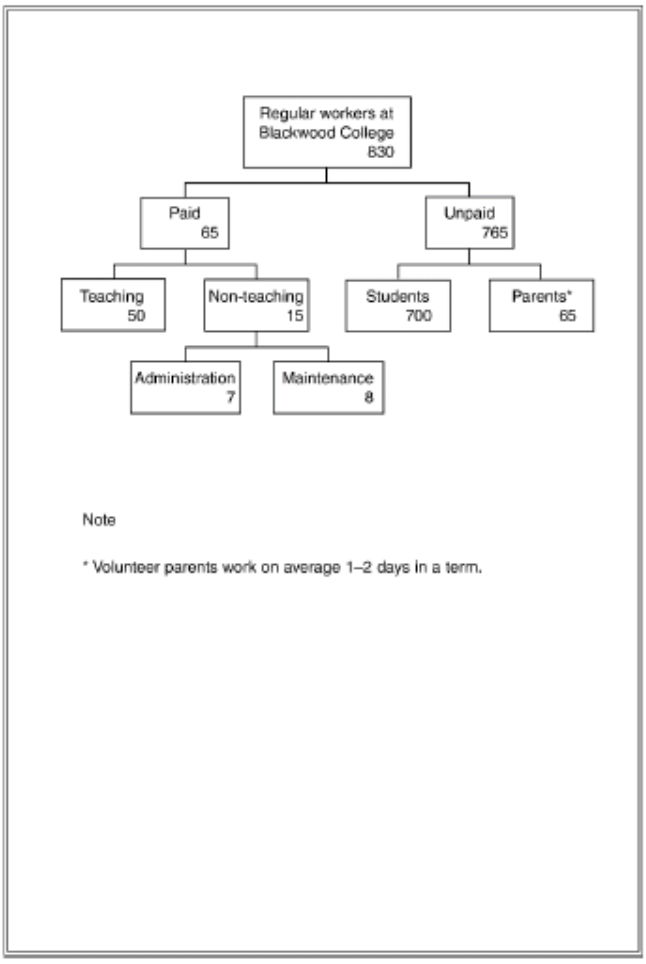
Recognise the purpose of common print conventions, such as use of symbols and simple graphics.

Sample items for end of lower secondary

Example 1

Annotated Question: Identify connections within a text

Blackwood College



Question: What are the two main groups into which the people who work at Blackwood College are divided?

A. teaching and non-teaching
B. students and non-students
C. paid and unpaid
D. administration and maintenance

Answer: C. paid and unpaid

Target reading construct: Interpreting information

Target Reading Strand: Interpreting

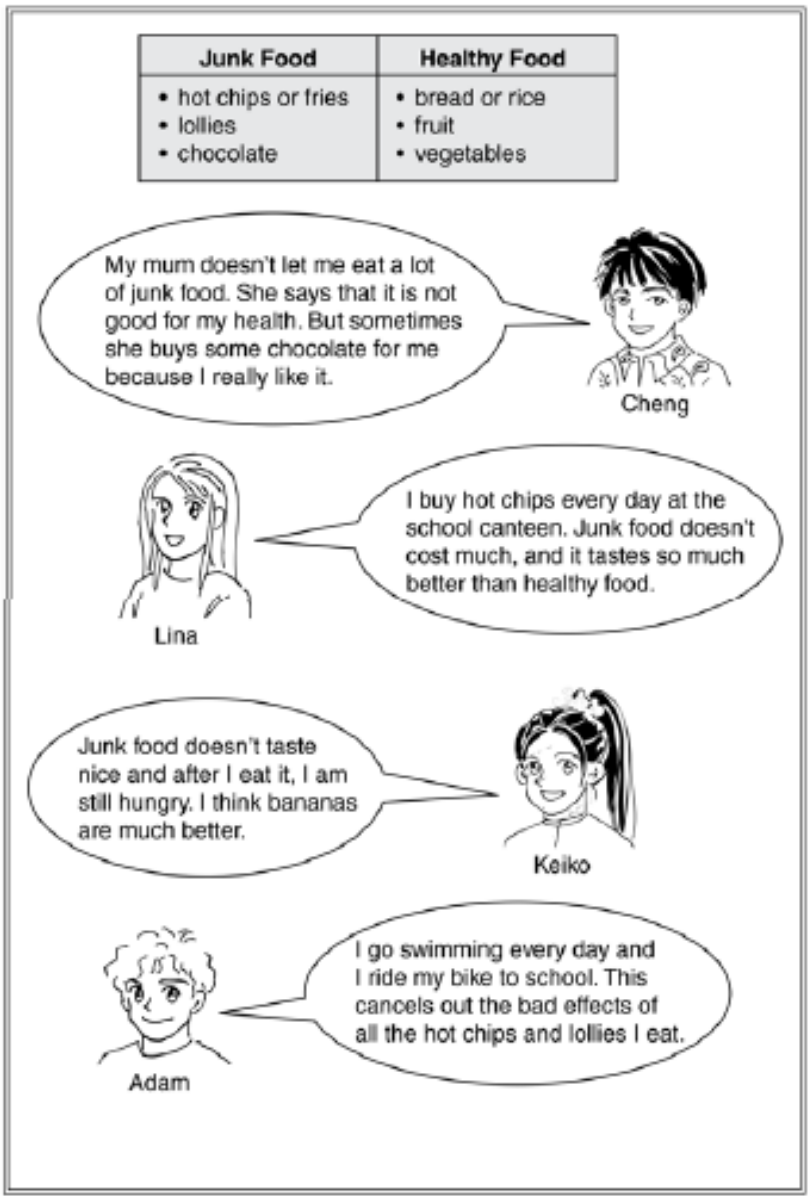
Target Skill: Identify connections between sections of a text.

Explanation

The student is required to use everyday knowledge or general reasoning to identify which is the main division of the tree-diagram. Once the reader realises that the diagram divides each category into two sub-categories, identifying the first division (into Paid and Unpaid) as the main division becomes relatively easy.

Example 2

Annotated Question: Interpret information



Question: Which two children eat the most junk food?

Answer: A short written answer that identifies Lina and Adam.

Target reading construct: Interpreting information

Target Skill: Make inferences, drawing on clear clues or prominent information, to summarise main ideas in paragraphs or across entire texts when there is some competing information.

Explanation

The student is required to interpret four opinions about Junk Food, and identify in writing which two speakers are likely to eat the most. This involves negotiating different sections of the text and dealing with competing information.

The information that Lina eats hot chips every day is prominent and there is a table at the beginning of the text that lists 'hot chips or fries' as Junk Food. However, if a student doesn't make this connection and does not consider hot chips to be Junk Food, then it is unlikely that the student would be able to identify Lina as a correct answer.

The information that Adam eats a lot of hot chips and lollies is located at the end of his statment. He starts by talking about exercise, and this distracting detail adds complexity to identifying Adam as a correct answer.

Cheng and Keiko both say they do eat junk food sometimes, which is more competing information that must be dismissed to arrive at the correct answers.

6. Mathematics

Mathematics: End of lower primary

Nutshell statement

Students demonstrate skills in number sense and computation, reading simple data displays, shape recognition and spatial orientation.

Expanded statement

Students can read, write and compare whole numbers up to 100. They can add and subtract numbers within twenty and solve application problems involving numbers within twenty. Students can recognise simple shapes and their elements. They can read simple data displays. They possess foundational knowledge of spatial orientation, and can appraise the relative size of real-world objects.

Constructs and Descriptors

Number knowledge

Number sense (counting, reading, writing, comparing, and ordering)

Count, read, write, compare, and order whole numbers up to 100.

Number sense (using place value and rounding)

Represent quantities up to 100 concretely, pictorially, and symbolically.

Compose and decompose whole numbers up to 100, using place-value concepts.

Operations (adding and subtracting)

Solve addition and subtraction problems within 20 that are presented concretely, pictorially, and symbolically

Operations (multiplying and dividing)

Divide a group of objects into 2 equal sets.

Real-word problems

Solve simple real-world problems using addition and subtraction facts within 20.

Measurement

Measurement units (standard and non-standard)

Use non-standard units to measure and compare length and weight.

Use standard units to measure length and weight.

Time

Tell time using a digital clock.

Sequence and describe events in time using parts of the day (e.g., morning, afternoon, evening).

Currency

Combine commonly used currency denominations to make a specified amount.

Statistics and Probability

Data management

Compare between categories of simple data displays (e.g., tally charts, pictographs) with up to four categories and a single unit scale.

Geometry

Constructions

Compose a larger two-dimensional shape from a small number of given shapes.

Decompose a larger two-dimensional shape into a small number of given shapes.

Properties

Recognise and name irregular basic shapes (e.g., if shown an irregular triangle, recognise that it is a triangle).

Recognise and name basic attributes of shapes (e.g., straight lines, curves).

Recognise two-dimensional shapes in everyday life.

Recognise when a two-dimensional shape has been translated (e.g., it is the same shape when it has been translated).

Position and direction

Interpret and use positional terms (e.g., in front of, behind, opposite, between).

Algebra

Patterns

Recognise and replicate non-numerical repeating patterns (e.g., colours, shapes, sounds).

Extend non-numerical repeating patterns, recognise repeating units, and identify a missing element (e.g., ❍□□❍□□__□□).

Relations and functions

Demonstrate understanding of equivalence pictorially.

Sample items for end of lower primary

Example 1

Straight or curved

Which shape has sides that are all curved?

Domain	Construct	Descriptor
Geometry	Properties	Recognise and name basic attributes of shapes (e.g., straight lines, curves).

Task solution: The fourth option is selected
Commentary: This task requires students to understand information presented verbally in a single short sentence, including the terms 'side' and 'curved' in the context of 2D shape properties. They then need to inspect each given shape to determine whether its sides are curved or straight, and select the shape that has all sides curved.

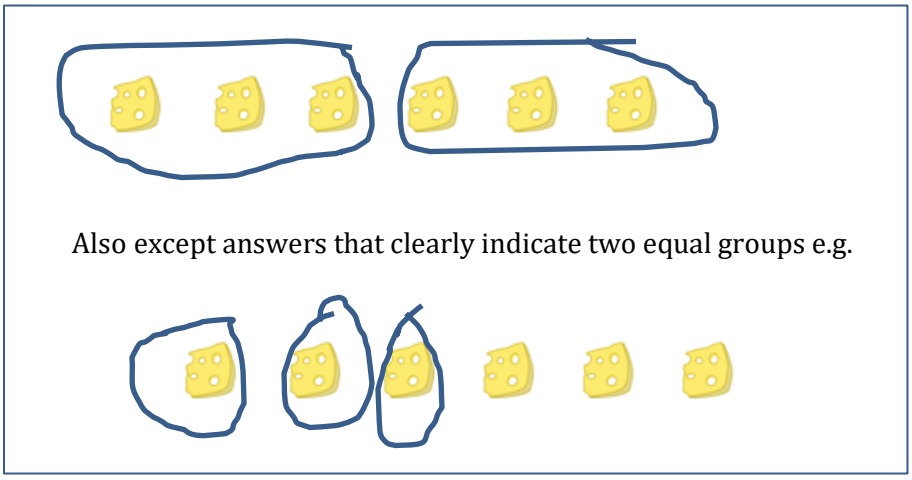
Example 2

Sharing cheese

Share the cheese into two equal groups.
Draw a circle around each group.

Domain	Construct	Descriptor
Number knowledge	Operations (multiplying and dividing)	Divide a group of objects into 2 equal sets.

Task solution: 1 mark for clear indication of three pieces of cheese in two groups



Also except answers that clearly indicate two equal groups e.g.

Commentary: This task requires students to understand information presented verbally in one short sentence, including the mathematical term 'equal groups' and interpret that term in relation to familiar real-world objects; and devise and use a strategy to solve the problem, e.g. work out half of six is 3 and then indicate 3 pieces (simple division).

Mathematics: End of primary

Nutshell statement

Students demonstrate skills in number sense, computation, real world problems, basic measurement, 2D shape recognition, and reading and interpreting simple data displays.

Expanded statement

Students can add and subtract whole numbers within 1,000 and demonstrate fluency with multiplication facts up to 10 x 10 and related division facts; solve simple real-world problems with whole numbers using the four operations (consistent with the grade and performance level) and identify simple equivalent fractions; select and use a variety of tools to measure and compare length, weight and capacity/volume; understand the relationships between different units of time, e.g. seconds, minutes, hours, days, weeks, months, and years; retrieve multiple pieces of information from data displays to solve problems; recognise and name two-dimensional shapes by their simple attributes; and apply the concept of equivalence by finding a missing value in a number sentence.

Constructs and Descriptors

Number knowledge

Number sense (counting, reading, writing, comparing, and ordering)

Read, write, compare, and order whole numbers up to 10,000.

Skip count forwards and backwards using twos, fives, tens, hundreds, and thousands.

Number sense (using place value and rounding)

Round numbers up to the nearest hundred and thousand.

Operations (adding and subtracting)

Add and subtract whole numbers within 1,000.

Operations (multiplying and dividing)

Demonstrate fluency with multiplication facts up to 10 x 10, and related division facts.

Real-word problems

Solve simple real-world problems using the four operations, with the unknown in different positions.

Fractions

Identify simple equivalent fractions where one denominator is a multiple of another (e.g., $\frac{1}{3} = \frac{2}{6}$).

Compare and order unit fractions (e.g., $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$) or fractions with the same denominator ($\frac{1}{8}$, $\frac{3}{8}$, $\frac{5}{8}$).

Measurement

Measurement units (standard and non-standard)

Select and use a variety of tools to measure and compare length, weight, and capacity/volume.

Area, perimeter, and volume

Solve problems, including real-world problems, involving the perimeter of a rectangle using concrete or pictorial representations of units (e.g., grid squares).

Time

Tell time using an analogue clock to the nearest quarter hour.

Solve problems involving elapsed time in half hour increments within an hour (e.g., difference between 3:00 and 3:30).

Understand the relationships between different units of time, e.g. seconds, minutes, hours, days, weeks, months, and years.

Statistics and Probability

Data management

Complete missing information in simple data displays using data arranged into categories, with some support provided (e.g., labelled horizontal and/or vertical axes).

Retrieve multiple pieces of information from data displays to solve problems (e.g., calculate a total represented by multiple bars on a graph).

Geometry

Constructions

Compose a larger two-dimensional shape from a small number of shapes in more than one way (if possible).

Decompose a larger two-dimensional shape into a small number of shapes in more than one way (if possible).

Recognise parallel and perpendicular lines.

Properties

Recognise and name two-dimensional shapes by their attributes (e.g., their lines and informal angle properties).

Recognise the congruence and similarity of two-dimensional shapes (e.g., shapes that have been reflected, translated, rotated, enlarged, or reduced).

Position and direction

Follow more complex directions and/or give simple directions to a given location (e.g., go straight, turn right at the corner with the tree, turn left at the next corner, keep going to the green house).

Algebra

Patterns

Describe numerical patterns as increasing by a constant value but starting at a number that is not a multiple of the value of the pattern (e.g., the pattern 5, 8, 11, 14 starts at 5 and goes up by 3).

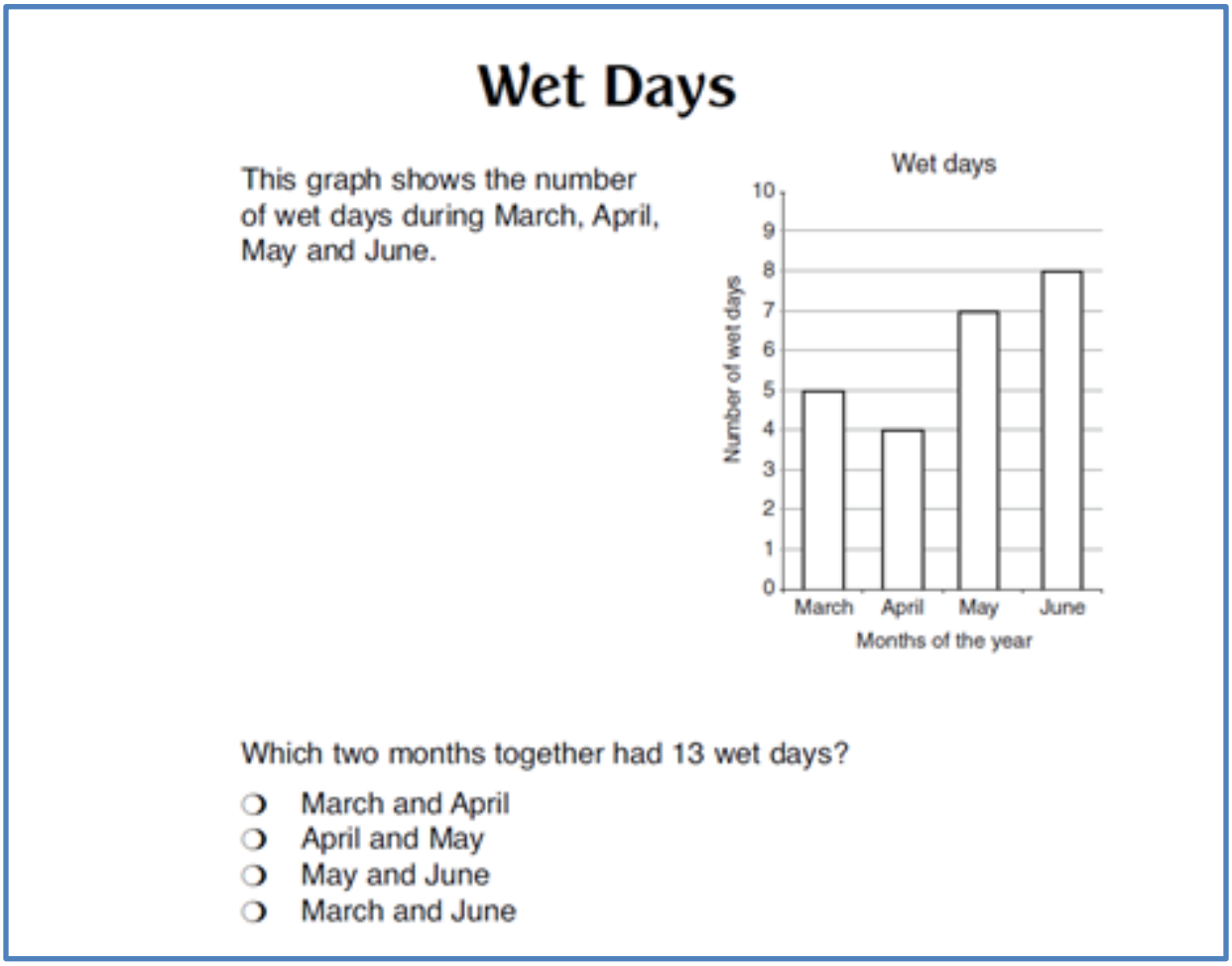
Relations and functions

Demonstrate understanding of equivalence by finding a missing value in a number sentence using addition or subtraction of numbers within 100 (e.g., 23 + __ = 29).

Sample items for end of primary

Example 1

Wet Days



Domain	Construct	Descriptor
Statistics and	Data management	Retrieve multiple pieces of information from data

Probability		displays to solve problems (e.g., calculate a total represented by multiple bars on a graph).

Task solution: The fourth option is selected (March and June)
Commentary: This task invites students to interpret a simple column graph containing counts for several data categories; requires students to interpret the language of 'two months together' and formulate this mathematically using the operation of addition; to identify and extract the relevant information from the data representation; then to perform appropriate calculations numerically or visually to identify the required solution. The students can use the appropriate operation (addition) or use an appropriate visual comparison strategy, to directly identify combinations of months that provide the required solution of a total of 13 days, or eliminate some options that do not provide the required solution. The sequence of actions required involve devising and following a multi-step strategy that includes interpretation, formulation and mathematical processing.

Example 2

Problem Solved

In the first half of a game, the Tigers score 1 goal and the Lions score 4 goals.
In the second half, both teams score the same number of goals.
At the end of the game, 9 goals have been scored altogether.

How many goals did each team score in the second half?

_____ goals

Domain	Construct	Descriptor
Number knowledge	Real-world problems	Solve simple real-world problems using the four operations, with the unknown in different positions.

Task solution: 3
Commentary: This task requires students to understand what the question is asking, develop strategies to enable them to solve the problem, then carry out those strategies and calculations to determine the answer. Students may choose to solve the problem using materials, mental methods or written algorithms. They may use concrete materials such as counters to represent the goals scored. They may use known number facts (such as bonds to 9), or they may write down the numbers and develop number sentences to solve each step of the problem.

Mathematics: End of lower secondary

Nutshell statement

Students demonstrate skills in computation, solving problems in measurement and geometry, interpreting and constructing a variety of data displays, and making use of algebraic representations.

Expanded statement

Students can apply the order of operations and solve simple problems involving fractions, decimals and whole numbers. They can apply geometric relationships and formulae (i.e. area of a triangle, circumference and area of a circle, surface area of a rectangular prism, Pythagorean theorem, angle sum of a triangle) to solve straightforward problems in simple contexts. They can interpret and construct, a variety of data displays and calculate measures of central tendency. They can graph linear equations on a coordinate grid. They can solve equations in one variable and model context-based situations using simple algebraic representations. They can evaluate and calculate with simple algebraic expressions. They can use proportional reasoning to solve problems.

Constructs and Descriptors

Number knowledge

Multiple operations

Evaluate numerical expressions requiring application of order of operations

Real-world problems

Solve problems with fractions, decimals, and whole numbers

Decimals and percentages

Represent fractions and/or decimals on a number line

Exponents

Apply the laws of exponents

Measurement

Measurement units (standard and non-standard)

Determine measurements by interpolating and/or extrapolating from scales on measurement tools

Angles

Classify angles in polygons

Area, perimeter, and volume

Determine the surface area of a simple three-dimensional object, e.g. a rectangular prism
Solve simple problems involving the area of triangles and the area and/or circumference of circles

Statistics and Probability

Data management

Read, interpret and construct a variety of data displays, including two-way tables, line graphs, circle (pie) graphs, compound bar graphs

Calculate range and measures of central tendency (e.g. mean, median and mode)

Chance and probability

Compare probabilities of simple events

Geometry

Properties

Determine measurements in right triangles using the Pythagorean theorem

Position and direction

Identify the outcomes of one or more transformations on a two-dimensional object

Cartesian plane

Graph linear equations on a coordinate grid

Algebra

Patterns

Describe, complete, and extend geometric and other non-linear sequences of numbers and objects

Relations and functions

Solve linear equations in one variable

Represent context-based situations with expression, and equations in one or two variables

Substitute values into and/or manipulate (expand, factorise, simplify) simple linear and non-linear expressions

Use formulas to solve context-based problems

Distinguish between linear and non-linear patterns and relationships

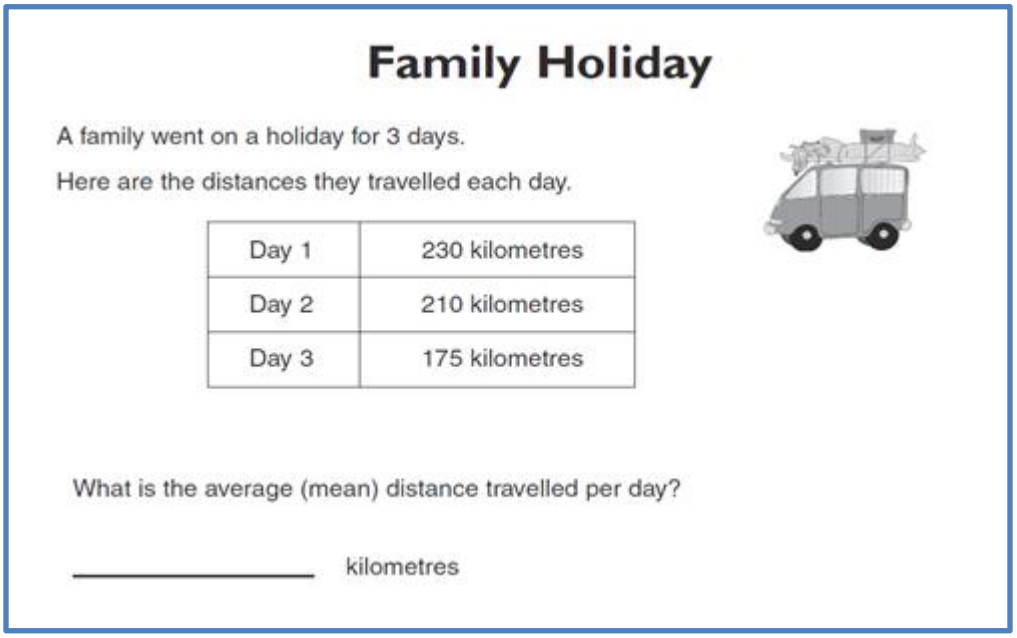
Variation (ratio, proportion, and percentage)

Solve problems involving ratios, proportions, and per cents

Sample items for end of lower secondary

Example 1

Family Holiday 1



Family Holiday

A family went on a holiday for 3 days.

Here are the distances they travelled each day.

Day 1	230 kilometres
Day 2	210 kilometres
Day 3	175 kilometres

What is the average (mean) distance travelled per day?

_____ kilometres

Domain	Construct	Descriptor
Statistics and Probability	Data management	Calculate measures of central tendency (e.g. mean, median and mode)

Task solution: 205 (kilometres)

Commentary: This task requires students to calculate the average (mean) distance by interpreting the meaning of the term 'average (mean)' and recognising which operations to use in a multi-stage solution strategy that they need to devise; correctly evaluating the average distance travelled per day from a set of tabular data for three days of travel and constructing a response.

Example 2

Index notation

$m^3 \times p^{-2}$

Which one of the following is equivalent to the index expression given above?

$3 \times m \times -2 \times p$	$\frac{m^3}{p^2}$	$\frac{p^2}{m^3}$	$\frac{1}{m^3 \times p^2}$
○	○	○	○

:

Domain	Construct	Descriptor
Number knowledge	Exponents	Apply the laws of exponents

Task solution: $\frac{m^3}{p^2}$

Commentary: This task requires a routine application of procedures for simplifying index expressions and fractions. It requires students to utilize the following aspects of mathematical knowledge:

- a number with a negative index can be rewritten so it has a positive index when its moved to the denominator of a unit fraction
- any whole number can be written as a fraction over 1
- the procedure for multiplying fractions (multiply numerators and multiply denominators)

$$m^3 \times \frac{1}{p^2} = \frac{m^3}{1} \times \frac{1}{p^2} = \frac{m^3}{p^2}$$

7. References

ACER. (2019a). ACER's Learning Progression for Mathematics (layers 1–3). . Camberwell: ACER.

ACER. (2019b). ACER's Learning Progression for Reading (layers 1–3) Camberwell: ACER.

ACER. (2019c). *Mapping Minimum Proficiency Levels to the ACER Learning Progressions*. ACER. Camberwell.

Gustafsson, M. (2019). *Costs and Benefits of Different Approaches to Measuring the Learning Proficiency of Students (SDG Indicator 4.1.1)*. (53). Montreal: UIS-UNESCO.

International Bureau of Education - UNESCO. (2019). *IBE Curriculum and Assessment Frameworks*. IBE-UNESCO.

Nitko, A. (2018). *Final Report of the Results of the Consensus Building Meeting on Proficiency Levels*. Retrieved from

USAID/UIS. (2019a). *Grade 2 to 6 Math Draft Performance Level Descriptors*. USAID/UIS. Washington DC.

USAID/UIS. (2019b). *Grade 2 to 6 Reading Performance Level Descriptors*. USAID/UIS. Washington DC.

8. Appendix: Comparison of MPLs from 2018 GAML meetings with suggested refinements

Table 2 and Table 3 show, for reading and mathematics respectively, the MPLs in the form provided from the Paris/Hamburg GAML meetings (Nitko, 2018) and suggested refinements of the text (the 'nutshell statement' versions presented in the body of this paper). The suggested refinements draw on a number of sources: an earlier set of suggested revisions, *Mapping Minimum Proficiency Levels to the ACER Learning Progressions* (ACER, 2019c); the *IBE Curriculum and Assessment Frameworks* (International Bureau of Education - UNESCO, 2019); output of the policy linking workshops conducted by USAID and UIS (USAID/UIS, 2019a, 2019b); and ACER's learning progressions for reading and mathematics (ACER, 2019a, 2019b).

Table 2 Original and Suggested Refinement for Reading MPLs

	Consensual Levels (Nitko, October 2018)	**Suggested Refinement (ACER, July 2019)**
End of Lower Secondary	Students establish connections between main ideas on different text types and the author´s intentions. They reflect and draw conclusions based on the text.	Students locate and connect multiple pieces of related information across sections of texts to understand key ideas. They make straightforward inferences when there is some competing information. They reflect and draw conclusions based on evidence, in a variety of text types.
End of Primary	Students interpret and give some explanations about the main and secondary ideas in different types of texts. They establish connections between main ideas on a text and their personal experiences as well as general knowledge.	Students independently and fluently read simple, short narrative and expository texts. They locate explicitly-stated information. They interpret and give some explanations about the key ideas in these texts. They provide simple, personal opinions or judgements about the information, events and characters in a text.
End of Lower Primary (Grades 2/3)	Grade 2: They read and comprehend most of written words, particularly familiar ones, and extract explicit information from sentences. Grade 3: Students read aloud written words accurately and fluently. They understand the overall meaning of sentences and short texts. Students identify the texts' topic.	Students read aloud and comprehend many single written words, particularly familiar ones, and extract explicit information from sentences. They make simple inferences when longer texts are read aloud to them.

Table 3 Original and Suggested Revision for Mathematics MPLs

	Consensual Levels (Nitko, October 2018)	Suggested Refinement (ACER, July 2019)
Lower Secondary	Students demonstrate skills in computation, application problems, matching tables and graphs, and making use of algebraic representations.	Students demonstrate skills in computation, solving problems in measurement and geometry, interpreting and constructing a variety of data displays, and making use of algebraic representations.
End of Primary	Students demonstrate skills in number sense and computation, basic measurement, reading, interpreting, and constructing graphs, spatial orientation, and number patterns.	Students demonstrate skills in number sense, computation, real world problems, basic measurement, 2D shape recognition, and reading and interpreting simple data displays.
End of Lower Primary (Grades 2/3)	Students demonstrate skills in number sense and computation, shape recognition and spatial orientation.	Students demonstrate skills in number sense and computation, reading simple data displays, shape recognition and spatial orientation.