Australian Government
Department of Foreign Affairs and Trade

ACER

Minimum Proficiency Levels Unpacked

October 2022

The Global Education Monitoring (GEM) Centre drives improvements in learning by supporting the monitoring of educational outcomes worldwide. The GEM Centre is a long-term partnership between the Australian Council for Educational Research (ACER) and the Australian Government's Department of Foreign Affairs and Trade (DFAT).

Minimum Proficiency Levels Unpacked

The Australian Council *for* Educational Research
19 Prospect Hill Road
Camberwell VIC 3124
Phone: (03) 9277 5555
ABN 19 004 398 145

www.acer.org
www.acer.org/au/gem

Recommended citation
Australian Council for Educational Research. (2022). Minimum Proficiency Levels Unpacked. https://research.acer.edu.au/monitoring_learning/63

This paper was developed in 2019 as a contribution by the GEM Centre in support of the UIS-led Global Alliance for the Monitoring of Learning (GAML). The original version was revised in August 2021 to incorporate changes suggested by ACER at the sixth meeting of GAML, and approved by UIS later that year. It has been further revised in 2022 in light of its use in the International Standard Setting Exercise (February–March 2022) of the GEM Centre.

Contents

1. Introduction 3
2. Addressing the challenge of interpreting Indicator 4.1.1 4
3. Unpacking the MPLs 6
4. Reading 9
5. Mathematics 25
6. References 39

Appendix A: History of MPLs development 40
Appendix B: Changes to the MPL definitions between 2018 and 2022 42
Appendix C: Glossary 47

1. Introduction

This document draws together work from several initiatives to establish Minimum Proficiency Levels (MPLs) for reading and mathematics, 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 content of this document, three deserve particular mention:

- The International Bureau of Education (IBE UNESCO) *Curriculum and Assessment Frameworks* (2019) – audits of national curriculum and assessment frameworks for reading and mathematics, spanning countries worldwide
- *Minimum Proficiency Levels: Described, unpacked and illustrated* (ACER, 2019), commissioned by UIS – a review and subsequent revision to the Nitko (2018) description of the MPLs
- *Global Proficiency Framework for Reading: Grades 1 to 9* (United States Agency for International Development et al., 2020a) and *Global Proficiency Framework for Mathematics: Grades 1 to 9* (United States Agency for International Development et al., 2020b – the outcome of a series of workshops and consultations of reading and mathematics experts from multiple agencies.

A detailed account of the history and evolution of the Minimum Proficiency Levels is provided in Appendix A.

2. 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 (reported in Nitko, 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 some countries primary school begins with a preparatory grade (called, amongst other things, 'reception', 'foundation' and 'kindergarten'), so that Grade 2 is the third year of school. In other countries, the first year of primary is called 'Grade 1', so Grade 2 is the second year of school. Similarly, regarding the second level of the MPLs, 'end of primary education', the final grade of primary varies across countries: generally, the last year of primary is Grade 5, 6 or 7; occasionally Grade 4. Thus, the end of primary education may be after anything from four to eight years of schooling (Gustafsson, 2019, p.14).

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 agreement regarding MPLs 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 (Nitko) that this issue was dealt with differently by reading and mathematics experts. The reading experts defined separate MPLs for Grade 2 and Grade 3, whereas the mathematics experts reached a combined 'Grade 2/3' MPL definition. (See Appendix B for the original formulations from the Nitko paper.) The variation in approaches may be hard to explain in the context of global discussions.

Turning to the 'end of primary' MPL, both reading and mathematics experts at the 2018 GAML meeting arrived at a single short MPL description, labelled 'Grades 4 & 6' for reading and 'Grades 4–6' for mathematics (UNESCO Institute of Statistics, 2018). However, when these descriptions are elaborated, to detail the associated skills, processes, knowledge and understanding, there are marked differences in the expectations of minimum proficiency level for Grade 4 and Grade 6. This is evidenced in the Grade level descriptors in the Global Proficiency Frameworks (GPFs) for Reading and Mathematics (United States Agency for International Development et al., 2020a and 2020b). The GPFs also set out distinct MPLs for Grade 5.

Finally, the 'end of lower secondary' was defined by the 2018 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 Grade 8 and Grade 9 proficiency is 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' is preferable.

In this document, a single MPL is presented for each learning area and for each of the three educational levels referred to in Indicator 4.1.1.

Advantages of this approach are:

- intelligibility for stakeholders
- fairness and comparability across countries
- consistency between reading and mathematics.

The end of lower primary MPLs (referred to in 4.1.1 as 'Grade 2/3') are described in terms of a single standard for reading and a single standard for mathematics. The alignment with the Global Proficiency Frameworks for reading and mathematics is closest to the 'Meets Global Minimum Proficiency' descriptions for Grade 2.

The end of primary MPLs (4.1.1b) are also described in terms of a single standard for reading and a single standard for mathematics. For both reading and mathematics, the alignment is closest to the 'Meets Global Minimum Proficiency' descriptions for Grade 5 in the Global Proficiency Framework.

Finally, the end of lower secondary MPLs (4.1.1c), represented as a single standard for reading and a single standard for mathematics, are most closely aligned with 'Meets Global Minimum Proficiency' descriptions for Grade 8 in the Global Proficiency Frameworks.

The grade-level alignments indicated above are not perfect, and it is left to the discretion of countries to apply an MPL to different grades than those outlined in the statements above about GPF alignment: for example, the lower primary MPL may be aligned with an assessment administered to children in their second, third or fourth year of school, because of specific local, national or regional 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 country 'should be required to state its reasons for any choices made' (Gustafsson, 2019, p.55).

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

3. Unpacking the MPLs

The remaining part of this paper presents descriptions of the MPLs, first for reading and then for mathematics, for the three educational levels of end of lower primary (4.1.1a), end of primary (4.1.1b) and end of lower secondary (4.1.1c). The MPLs are described and elaborated in four ways:

- nutshell statements
- expanded statements
- domains, constructs and descriptors
- sample items.

The first and briefest representation 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).

The second representation 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 a national policy level or local level.

The third representation is *domains, constructs and descriptors*. The *domains* are the major content-based strands for reading and mathematics respectively. The *constructs* are threads of skills, knowledge and understanding that run through each of the domains. The descriptors provide further elaboration of the skills, knowledge and understanding expected at each MPL. This third representation uses relatively 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.

The fourth representation is a small set of *sample items*, giving a more concrete sense of the degree of challenge reflected in each MPL. The sample material is intended to be particularly useful for teachers.

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

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. 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 establishes a shared set of terms to support shared understanding of the MPLs.

The set of terms adopted here – *learning area*, *domain*, *construct* and *descriptor* – is a slightly modified version of that used in the IBE Curriculum and Assessment Frameworks (International Bureau of Education - UNESCO, 2019). The terminology of *domain* and *construct* is also consistent with, though not identical to, that used in the *Global Proficiency*

Frameworks for reading and mathematics (United States Agency for International Development et al., 2020a and 2020b).[1]

The hierarchy of terms used in this document is set out in Table 1, from broadest to most granular.

Table 1 : Terminology for the hierarchy of classifications representing the MPLs

Learning areas	Reading	Mathematics
Domains	Decoding Reading comprehension Listening comprehension[2]	Number and operations Measurement Statistics and probability Geometry Algebra
Constructs	Precision Fluency Retrieving information Interpreting information Reflecting on information	Whole numbers Fractions Decimals Integers Exponents and roots Operations across number Length, weight, capacity, volume, area and perimeter Time Currency Properties of shapes and figures Spatial visualisations Position and direction Data management Chance and probability Patterns Expressions Relations and functions
Descriptors	*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

[1] The IBE *Curriculum and Assessment Frameworks* and the *Global Proficiency Frameworks* for mathematics and reading use a more fine-grained division of constructs, 'sub-constructs'. This level of classification is, however, not used in the current document.

[2] This domain is called 'Comprehension of spoken or signed language' in *Global Proficiency Framework for Reading*.

Table 1 shows that the *learning area* of Reading has three *domains* (Decoding, Reading comprehension and Listening comprehension). The *learning area* of Mathematics has five *domains* (Number and operations; Measurement; Geometry; Statistics and probability; 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 Table 1) 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).

4. Reading

Reading: End of lower primary (SDG 4.1.1a)

Nutshell statement

Students accurately read aloud and understand written words from familiar contexts. They retrieve explicit information from very short texts. When listening to slightly longer texts, they make simple inferences.

Expanded statement

In a short simple text of one or two sentences, students 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 common morphological changes, and also some unfamiliar words. They retrieve explicit information from a single sentence. When listening to longer texts, and looking at the illustrations, students retrieve explicit information about main events, ideas or characters and use that information to draw simple inferences.

Domains, constructs and descriptors

Decoding

In a short and simple connected text of one or two sentences, decode most words, including some unfamiliar words with familiar sound–symbol patterns (applies to alphabetic and alpha-syllabic languages only).

Reading comprehension

Retrieving information

Identify the meaning of familiar words in a sentence.

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

Listening 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 that may be unfamiliar.

Sample items for end of lower primary reading

NOTE: Examples 1 and 2 address the domain of reading comprehension. The questions may be read aloud to the students, and answers may be given orally or in writing; but in order to meet the End of Lower Primary MPL, students must independently read the information on which the question is based (for example, if a task requires matching a word to an image, students must independently read the word).

Example 1

Vijay is helping his dad. They are picking fruit and putting it into bags. Dad is going to take the fruit to the market.

Question: Where is Dad going?

Answer: 'Market' or 'to the market' or 'Dad is going to the market' or 'Dad is going to take the fruit to the market.'

['Dad is picking fruit' is incorrect.]

Domain	Construct	Descriptor
Reading comprehension	Retrieving information	Locate most pieces of explicit information within a sentence when the information is prominent and there is no or limited competing information.

Commentary:

Students read a short, simple text of three sentences and locate a piece of explicit information ('market') which is near to the matched words in the question ('is', 'Dad' and 'going'). The target information is within one sentence, and it is prominent as it is at the end of the text. The vocabulary is likely to be familiar to students and there is no competing information (only one place is mentioned). Students may give their answer orally or in writing.

Example 2

Question: What does the picture show?

A. The girl sits in the basket.

B. The girl washes the basket.

C. The girl stands next to the basket.

Answer: C. The girl stands next to the basket.

Domain	Construct	Descriptor
Reading comprehension	Retrieving information	Identify the meaning of familiar words in a sentence.

Commentary:

The question ('What does the picture show?') may be read to the students. The task for the student is to independently read and select the correct option in this multiple-choice question. Each option is a simple sentence, with 'the girl' and 'the basket' repeated in each. The difference is in the words that describe what the girl is doing. Students need to identify the meaning of the word ('stands') that matches the picture. While the picture must be interpreted in order to answer the question, this should be a trivial task for students at this level: the challenge of the item is in reading the three sentences and recognising the words that match the picture. Both the context shown in the picture and the vocabulary in the sentences are likely to be familiar to students at this level.

NOTE: The next two items illustrate the domain of Listening comprehension. 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, they are able to understand texts of greater complexity when such texts are read aloud to them, compared to when they read for themselves. The texts in examples 3 and 4 would be read aloud to students (that is, they would not be expected to read the texts themselves).

Example 3

The cat

Dodo

Ayasha has a cat called Dodo. She is looking for Dodo. She looks in the toy basket. She sees Dodo's favourite toy mouse, but no Dodo. Ayasha looks in the kitchen. She puts some milk in a saucer and calls, 'Dodo come and get some milk', but Dodo does not come. Then she sees Dodo. He is asleep by the window, lying in the sun.

Question: Why doesn't Dodo come when Ayasha calls?

Answer: Because he is asleep. [or similar]

Domain	Construct	Descriptor
Listening comprehension	Interpreting information	In a longer text that is read aloud to them, make simple inferences and identify the meaning of key words that may be unfamiliar.

Commentary:

Students listen to a short story and make a simple inference across the last three sentences, from 'She puts some milk in a saucer …' to the end. Dodo does not come when Ayasha calls him because he is asleep. The causal connection is implicit rather than explicit – the term 'because' is not used – so this item is classified as 'interpreting information' rather than 'retrieving information'. This text is unlikely to contain any words that are unfamiliar to students at this level. However, in order to answer the question successfully, students need to track the noun and pronoun referencing in the story (Ayasha … she; Dodo … he).

Example 4

Thambo

'Hurry up, Thambo,' calls Mum. 'You will be late for school.' Mum is getting cross.

Then Mum hears their goat bleating and looks outside. Thambo is dragging the goat away from the gate to the vegetable garden. Mum goes outside.

'The gate was not tied up properly and the goat was pushing it open,' explains Thambo. 'She wanted to eat the plants.'

Mum helps Thambo to tie the gate up securely this time.

'Thanks for saving our vegetables,' says Mum.

Question: What did the goat want to do?

Answer: Refers to the goat wanting to eat the plants/vegetables or wanting to push the gate open.

Domain	Construct	Descriptor
Listening comprehension	Retrieving information	In a longer text that is read aloud to them, identify key events, ideas and major characters.

Commentary:

Students listen to and follow the story. They need to identify the main characters and a key idea – that the goat wanted to get into the vegetable garden – which is explicitly stated by Thambo. This statement occurs in the middle of the text, which is longer than those that students working at this level would be expected to read independently (compare the text in Example 1).

Reading: End of primary (SDG 4.1.1b)

Nutshell statement

Students independently and fluently read simple, short narrative and expository texts. They retrieve explicitly stated information. They interpret and give some explanation about the main and secondary ideas in different types of texts, and establish connections between main ideas in a text and their personal experiences.

Expanded statement

In a short, simple narrative or expository text, students read aloud at a pace and a level of accuracy and expression (prosody) that demonstrate 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 and some secondary ideas in a text if they are 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.

Domains, constructs and descriptors

Decoding

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

Reading comprehension

Retrieving information

Locate most pieces of explicit information when the information is prominent and found within a single paragraph containing limited competing information.

Interpreting 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.

Establish the main idea of a text when it is prominent in the text.

Make simple inferences by relating two or more prominent pieces of explicitly stated information, when there is little or no competing information, in order to identify 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 reading

Example 1

Shark

The Dwarf Lantern Shark

Are you afraid of sharks?

Some sharks are harmless. The dwarf lantern shark cannot hurt you. You might think sharks are large but this one is not. It is so small you can hold it in one hand.

Another unusual thing about dwarf lantern sharks is that they glow in the dark. They live at the bottom of very deep oceans. There is no light where they live. They make their own light.

Question: What does this text tell you about dwarf lantern sharks?

A. what food they eat

B. how they have babies

C. why you should be afraid of them

D. how they are different from other sharks

Answer: D. how they are different from other sharks

Domain	Construct	Descriptor
Reading comprehension	Interpreting information	Establish the main idea of a text when it is prominent in the text.

Commentary:

The main idea of the text – that the dwarf lantern shark is not like other sharks – is prominent, though not explicitly stated. The strongest hint is in the third paragraph, which opens with the words 'another unusual thing'. The first two paragraphs have set up the surprise that this shark is not one to be afraid of, making the third option of the multiple-choice item clearly wrong. The other two options, concerning food and babies, are topics not mentioned at all in the text, so they represent very limited competing information.

Example 2

Sassoon and Marco

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.

Question: Why does Marco hold the story up high?

A. because he has finished reading it
B. so Sassoon cannot reach it
C. so the teacher can see it
D. because it was on top of Sassoon's desk

Answer: B. so Sassoon cannot reach it.

Domain	Construct	Descriptor
Reading comprehension	Interpreting information	Make simple inferences by relating two or more prominent pieces of explicitly stated information, when there is little or no competing information, in order to identify behaviours, feelings, events and factual information.

Commentary:

This question requires students to infer a causal relationship from several details in a narrative text. It focuses on an explicitly stated action (Marco holding the story up high) that is a secondary idea in the context of the overall situation. The reason for Marco holding the story up high is not explicitly stated, but by linking across the events described in the first few sentences (Marco 'picks up the story' and 'starts to read it'; Sassoon says, 'it's private', and tries to 'grab it back'), the reader can infer that Marco is trying to prevent Sassoon from recovering his story.

Example 3

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.

Question: What is the teacher probably going to do?

Answer: Any plausible response that is consistent with the teacher having asked the boys to explain the situation. For example:

- give the story back to Sassoon
- tell the boys not to fight
- take the book away from Marco.

Domain	Construct	Descriptor
Reading comprehension	Reflecting on information	Establish basic connections between the key ideas in a text and personal knowledge and experience.

Commentary:

This question requires students to make a prediction: what will happen after the teacher sees Sassoon trying to grab his book from Marco. This is likely to be a familiar scenario with several plausible outcomes. For example, the teacher may recognise the injustice being done to Marco and return his book, or she could just tell both boys to stop fighting and even take the book away. Responses that are inconsistent with the text would be considered incorrect. For example, the teacher is clearly going to do something, as she has asked the boys to explain themselves, so 'do nothing' or 'leave the room' would be considered incorrect. The item is classified as 'Reflecting on information' as readers need to draw on their personal experience of classrooms and teacher/student interactions in order to provide a plausible response.

Students need to read the text themselves, but may give either an oral or written response to the question.

Reading: End of lower secondary (SDG 4.1.1c)

Nutshell statement

Students retrieve 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 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 straightforward inferences by drawing on prominent explicit and implicit 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.

Domains, constructs and descriptors

Decoding

In languages with large and complex sets of symbols, accurately decode most words.

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.

Locate paratextual information in continuous and non-continuous texts (for example, 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 demonstrate understanding of 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 (for example, a simple comparison of two characters or two events).

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

Reflecting on information

Recognise the implied audience of a text with a familiar format and content when there are multiple clues.

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.

Distinguish between fact and opinion when the distinction is straightforward (for example, ‘Evidence shows that …’ [fact] versus ‘In my view, …’ [opinion]).

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

Sample items for end of lower secondary reading

Example 1

Table

Country Fact File

	Afghanistan 	**Vietnam** 	**Philippines** 	**Nepal** 
Climate	arid to semi- arid; freezing winters and hot summers	tropical in south; monsoonal in north	usually hot and humid	subtropical in south; cool summers and severe winters in north
Geography	landlocked and mountainous	the fertile Mekong River delta covers a large part of southwestern Vietnam	made up of 7107 islands	landlocked; contains eight of the world's 10 highest peaks
Main crops	wheat, fruits, nuts; wool, sheepskins	paddy rice, coffee, rubber, cotton, fish	sugarcane, coconuts, rice	rice, corn, wheat, sugarcane, milk
Typical exports (goods sold to other countries)	fruits and nuts, carpets, saffron	crude oil, marine products, rice, coffee, rubber, garments	electronic equipment, transport equipment, garments	carpets, clothing, leather goods
Wildlife	the Marco Polo sheep: it has the longest horns of any sheep	the saola (related to wild cattle): one of the world's rarest animals	the Philippine Eagle: the largest eagle in the world	the one- horned rhinoceros: the world's fourth largest land mammal

Question: Which two countries export carpets?

Answer: Afghanistan and Nepal

Domain	Construct	Descriptor
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.

Commentary:

The question requires the student to locate two pieces of information that match the given criterion (exporting carpets). A reader proficient at this level will understand the structure of the table and look for the word 'export' in the heading of the fourth row, then scan along the row to find the word 'carpet'. Again, using their understanding of the table's structure, students will locate the names of the two countries, Afghanistan and Nepal, by scanning up to the headings of the two columns that contain the word 'carpet'. Students reading at this level will be familiar with a variety of text types, including both continuous (prose) and non-continuous formats, such as tables, which are commonly used in many school-related contexts as well as in everyday life.

Example 2

Table

Country Fact File

	Afghanistan 	Vietnam 	Philippines 	Nepal 
Climate	arid to semi- arid; freezing winters and hot summers	tropical in south; monsoonal in north	usually hot and humid	subtropical in south; cool summers and severe winters in north
Geography	landlocked and mountainous	the fertile Mekong River delta covers a large part of southwestern Vietnam	made up of 7107 islands	landlocked; contains eight of the world's 10 highest peaks
Main crops	wheat, fruits, nuts; wool, sheepskins	paddy rice, coffee, rubber, cotton, fish	sugarcane, coconuts, rice	rice, corn, wheat, sugarcane, milk
Typical exports (goods sold to other countries)	fruits and nuts, carpets, saffron	crude oil, marine products, rice, coffee, rubber, garments	electronic equipment, transport equipment, garments	carpets, clothing, leather goods
Wildlife	the Marco Polo sheep: it has the longest horns of any sheep	the saola (related to wild cattle): one of the world's rarest animals	the Philippine Eagle: the largest eagle in the world	the one- horned rhinoceros: the world's fourth largest land mammal

Question: Which of these statements is an opinion and which is a fact about the information in 'Country Fact File'? Write 'fact' or 'opinion' next to each statement.

- The Philippines has the best weather for a holiday.
- Two of the countries are landlocked.
- Vietnam has the greatest number of different exports.
- All of the countries have interesting wildlife.

Answer: Opinion, Fact, Fact, Opinion

Domain	Construct	Descriptor
Reading comprehension	Reflecting on information	Distinguish between fact and opinion when the distinction is straightforward (for example, 'Evidence shows that …' [fact] versus 'In my view, …' [opinion]).

Commentary:

The question presents four statements about the text and requires students to evaluate whether each of the statements is a fact or an opinion. The inclusion of subjective words in the statements of opinion ('best', 'interesting') should make this distinction fairly prominent to students. However, the word 'fact' in the title of the table may act as competing information.

Example 3

Folk Tale

Beans

An old farmer was becoming frail. He decided to give his farm to a younger man. He had two nephews, but he was not sure if he could trust either of them. He invited them to his farm and gave them a test.

He gave each nephew a pot and a handful of beans. He told the nephews to plant the beans in their pot and come back in one month. He told them that he would then decide who was the most suitable man to take over his farm.

One month later, the two nephews came back.

The first nephew showed the farmer his pot. 'I worked very hard, Uncle. I gave my beans sun and water just like you said. Look at my plants now. They are healthy and green and are almost up to my knee.'

The second nephew showed the farmer his pot. 'I don't understand, Uncle. I gave my beans sun and water just like you said, but nothing has grown. I don't deserve the farm.'

The farmer reached into his pocket for the keys to his farm. 'Thank you, my nephews. This little test has shown me whom I can trust.' He handed the keys to his second nephew. 'The beans had already been cooked. They were never going to grow.'

Question: How would the first nephew have felt at the end of the story?

Answer: Any plausible response that is consistent with the first nephew failing the test after being eager to pass it. May refer to being caught cheating. For example:

- He would have felt ashamed.
- Embarrassed.
- Disappointed that he did not get the farm.
- Annoyed that he was caught cheating.
- Furious with the uncle because he did not give him the farm.
- Determined to seek revenge on the uncle and the other nephew.

Domain	Construct	Descriptor
Reading comprehension	Interpreting information	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.

Commentary:

At the end of the story, the response of the first nephew – the one who cheated in the test – is not included in the text, and must be inferred. There are clues in the text to help. The first nephew boasts about his plants, so is clearly eager to win the competition and claim the farm. He doesn't win and so the obvious inference is that he will experience disappointment. Answers that refer to other plausible negative emotions – he might feel angry or frustrated – are also acceptable.

5. Mathematics

Mathematics: End of lower primary (SDG 4.1.1a)

Nutshell statement

Students recognise, read, write, order and compare whole numbers up to 100. They demonstrate computational skills involving the processes of addition, subtraction, doubling and halving for whole numbers within 20. They recognise and name familiar shapes and describe their basic attributes. They recognise time in days, weeks and months. They describe location in a space using simple language.

Expanded statement

Students can read, write and compare whole numbers up to 100. They can add and subtract numbers within 20, double and halve whole numbers within 20, and solve application problems involving numbers within 20. Students can recognise simple shapes and their attributes and use these shapes to make other shapes. They can also measure and compare lengths of shapes and lines using non-standard units. They use calendars and recognise days in a week and months in a year. They can read simple data displays. They possess foundational knowledge of spatial orientation, and can appraise the relative size of real-world objects.

Domains, constructs and descriptors

Number and operations

Whole numbers

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

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

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

Divide a group of up to 20 objects into 2 equal sets.

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

Measurement

Length, weight, capacity, volume, area and perimeter

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

Time

Tell time using a digital clock.

Tell time using an analogue clock to the nearest hour.

Recognise the number of days in a week and months in a year.

Solve problems, including real-world problems, using a calendar (for example, given a calendar, answer the question: March 2 falls on which day of the week?).

Currency

Count combinations of commonly used currency denominations.

Combine commonly used currency denominations to make a specified amount.

Statistics and probability

Data management

Compare categories of simple data displays (that is, simple column graphs / bar graphs, tally charts, pictographs) with up to four categories and a single unit scale (for example, for a column graph showing favourite colours, make statements like: 'More children chose green than yellow, 'Blue was the most popular colour', 'Three more children chose blue than chose red').

Geometry

Spatial visualisations

Compose/decompose a larger two-dimensional (2D) shape from a small number of given shapes without lines showing where the shapes go (for example, use the smaller shapes to make the larger shape:

).

Properties of shapes and figures

Recognise and name shapes that are regular and irregular (for example, if shown an irregular triangle, recognise that it is a triangle; name a hexagon).

Recognise and name straight and curved lines and attributes of shapes (for example, number of sides, number of corners).

Recognise when a 2D shape has been rotated or reflected (for example, when shown a number of shapes, identify those that are the same, even when some are rotated or reflected).

Position and direction

Interpret and use positional terms (for example, in front of, behind, opposite, between).

Accurately use the terms left and right (for example, answer, 'Where is the teacher's desk?' 'To the [left] of the chalkboard.').

Algebra

Patterns

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

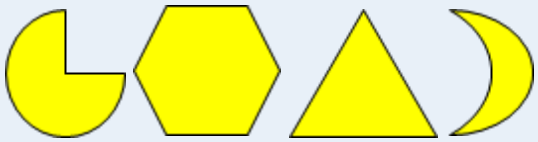
Sample items for end of lower primary mathematics

Example 1

Straight or Curved

Please read the following question aloud to the student:

Question: Which shape has sides that are all curved?



Answer: The fourth option is selected.

Domain	Construct	Descriptor
Geometry	Properties	Recognise and name straight and curved lines and attributes of shapes (for example, number of sides, number of corners).

Commentary:

This task requires students to understand information presented orally 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

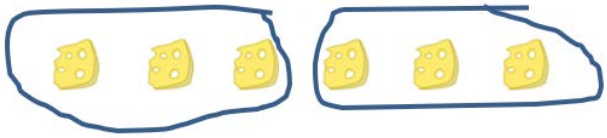
Please read the following question aloud to the student:

Share the cheese into 2 equal groups.

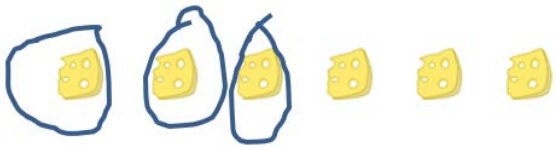
Draw a circle around each group.

Answer:

Clear indication of 3 pieces of cheese in 2 groups:



Also accept answers that clearly indicate 2 equal groups, for example:



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

Commentary:

This task requires students to understand information presented orally in one short sentence, including the mathematical term 'equal groups', and interpret that term in relation to familiar real-world objects. It further requires them to devise and use a strategy to solve the problem – for example, work out half of 6 is 3 and then indicate 3 pieces (simple division).

Mathematics: End of primary (SDG 4.1.1b)

Nutshell statement

Students recognise, read, write, order and compare whole numbers within 100,000, unit fractions and their multiples. They add/subtract with whole numbers within 1,000 and multiply/divide with whole numbers within 100. Students can measure length, weight and capacity using standard units; read time on an analogue clock; calculate the perimeter of simple 2D shapes and the area of rectangles; and describe the attributes of familiar 2D and 3D shapes. They read, interpret and construct different types of data displays such as tables, column graphs and pictographs, and recognise, describe and extend number patterns. They can solve simple application problems.

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 application problems with whole numbers using the four operations; identify simple equivalent fractions; compare and order unit fractions and fractions with related denominators; identify and represent quantities using decimal notation up to the tenths place; select and use a variety of tools to measure and compare length, weight and capacity/volume; read time to the minute on an analogue clock and calculate elapsed time in minutes within and across the hour; construct data displays with data arranged into categories and single or multi-unit scales; retrieve multiple pieces of information from data displays to solve problems; recognise and name 2D shapes and familiar 3D objects by their simple attributes such as number of faces, edges and vertices for 3D shapes and number of sides and corners for 2D shapes; describe and continue number patterns that increase or decrease by a constant value from any starting point; or that increase or decrease by a constant multiplier; and apply the concept of equivalence by finding a missing value in a number sentence.

Domains, constructs and descriptors

Number and operations

Whole numbers

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

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

Round whole numbers up to the nearest hundred and thousand.

Add and subtract whole numbers within 1,000.

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

Solve simple real-world problems using the four operations, with the unknown in different positions (addition and subtraction within 1,000 and multiplication problems using facts up to 10 × 10 and their associated division facts).

Fractions

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

Compare and order unit fractions (for example, $\frac{1}{4}, \frac{1}{3}, \frac{1}{2}$) or fractions with different but related denominators (for example, $\frac{2}{3}, \frac{7}{12}, \frac{5}{6}$).

Decimals

Identify and represent quantities using decimal notation (symbols) up to the tenths place (for example, identify that 0.8 is eight tenths).

Measurement

Length, weight, capacity, volume, area, and perimeter

Select and use a variety of tools to measure and compare length, weight, and capacity/volume (to the nearest marked increment on the scale).

Identify the relationship between the relative size of adjacent units within a familiar standard system of measurement for length, weight and capacity/volume (for example, identify the number of millimetres in a centimetre, the number of pints in a quart, the number of grams in a kilogram).

Calculate the perimeter of a polygon.

Solve problems, including real-world problems, involving the area of a rectangle.

Time

Tell time using an analogue clock to the nearest minute.

Solve problems, including real word problems, involving elapsed time in minutes across hours (for example, calculate the difference between 3:24 and 5:12 or the difference between 16:35 and 18:22), including problems involving schedules (that is, timetables, agendas, itineraries).

Statistics and probability

Data management

Complete missing information in simple data displays using data arranged into categories, with a single or multi-unit scale, with some support provided (for example, labelled horizontal and/or vertical axes).

Retrieve multiple pieces of information from data displays to solve problems (for example, calculate a total represented by multiple bars on a graph, compare two categories on the graph).

Geometry

Spatial visualisations

Identify the net of a cube or specific faces on the net of a cube (for example, fold mentally to answer the question, 'Which of these is the net of a cube?'; 'Identify opposite faces on a net.').

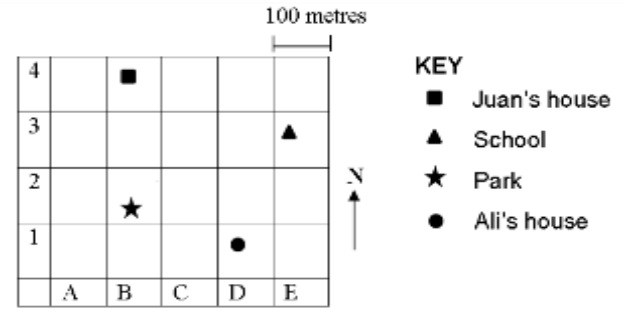
Properties of shapes and figures

Recognise and name 2D shapes and simple 3D objects by their attributes (that is, their lines and angle properties; for example, distinguishing between equilateral, isosceles and scalene triangles; describing the number of faces, edges and vertices of a rectangular prism).

Position and direction

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

Use different kinds of simple maps, such as alphanumeric maps, grid maps, or local equivalents, to give and follow two-step directions to a given location (for example, 'Using this map, if you are at the school, you walk 100 metres north, and turn left. What would you be facing?'; 'Which of these is closest to the distance between the park and Juan's house? 100 metres / 150 metres / 200 metres / 250 metres).



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 (for example, the pattern 5, 8, 11, 14 starts at 5 and goes up by 3).

Describe numerical patterns that increase or decrease by a constant multiplier, and use this information to identify a missing element or extend the pattern (for example, describe that the pattern 2, 4, 8, 16 starts at 2 and doubles or that the pattern 20, 10, 5, 2.5 starts at 20 and halves; identify the missing element in the pattern 3, 6, __, 24, 48; write the next two numbers in the pattern 80, 40, 20, 10).

Relations and functions

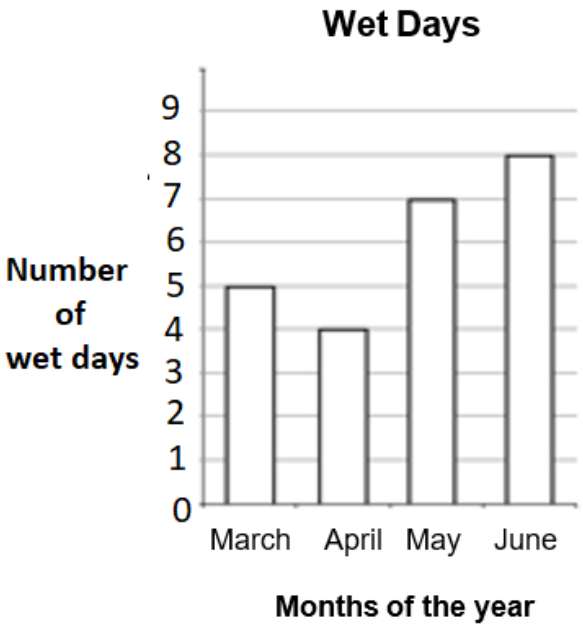
Demonstrate understanding of equivalence by finding a missing value in a number sentence using addition, subtraction, multiplication or division of numbers within 100 (for example, 23 + __ = 29; 6 × __ = 54).

Sample items for end of primary mathematics

Example 1

Wet Days

This graph shows the number of wet days during March, April, May and June.



Question: Which two months together had 13 wet days?

A. March and April

B. April and May

C. May and June

D. March and June

Answer: D. March and June

Domain	Construct	Descriptor
Statistics and probability	Data management	Retrieve multiple pieces of information from data displays to solve problems (for example, calculate a total represented by multiple bars on a graph).

Commentary:

This task invites students to interpret a simple column graph containing counts for several data categories and requires students to interpret the language of 'two months together' and formulate this mathematically using the operation of addition. It further requires them to identify and extract the relevant information from the data representation and 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 involves 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, the two teams score the same number of goals.

At the end of the game, 9 goals have been scored altogether.

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

_____ goals

Answer: 2

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

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 (SDG 4.1.1c)

Nutshell statement

Students demonstrate skills in computation with fractions, decimals, rates, ratios, percentages and integers. They apply geometric relationships and formulae such as area, volume, Pythagoras' theorem, and the angle sum of a triangle. They interpret and construct a variety of data displays and calculate measures of central tendency. They make use of algebraic representations of linear relationships. They can use their mathematics knowledge to solve application problems.

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 (namely, area of a triangle, circumference and area of a circle, volume of a rectangular prism, Pythagoras' theorem, and 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.

Domains, constructs and descriptors

Number knowledge and operations

Operations across number

Evaluate numerical expressions requiring application of order of operations.

Solve problems with fractions, decimals, and whole numbers.

Identify and express percentages less than 1% and greater than 100% as fractions or mixed numbers and vice versa (for example, 124% =$1\frac{24}{100}$; 0.2% = $\frac{2}{1000}$).

Multiply and divide two decimal numbers and divide a whole number by a decimal.

Solve real-world application problems involving the multiplication or division of two decimal numbers.

Fractions/decimals

Compare and order positive and negative decimals and fractions (for example, place these numbers on a number line from –1 to +1: –0.4, $+\frac{1}{2}$, $-\frac{4}{5}$, 0.25, $-\frac{1}{3}$, $\frac{3}{4}$).

Exponents and roots

Apply the laws of exponents.

Measurement

Length, weight, capacity, volume, area, and perimeter

Make conversions of units of length and weight between different systems of measurement when the conversion factor is provided (for example, convert 12 cm to inches given 1 inch is 2.54 cm; convert pounds to kilograms given 1 pound is 0.45 kg).

Solve problems, including real-world problems, involving the calculation of the volume of a rectangular prism (for example., calculate the volume in cubic centimetres of a box with a length of 10 cm, width of 10 cm, and height of 15 cm).

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 (namely, mean, median and mode).

Chance and probability

Compare probabilities of simple events.

Geometry

Properties of shapes and figures

Classify angles in polygons.

Recognise and name parts of the circle (namely, radius, diameter, circumference) and identify the relationship between the radius and diameter.

Describe and implement 2D shape transformations (namely, reflection, rotation, translation, enlargement/reduction).

Determine measurements in right triangles using Pythagoras' theorem.

Use the angle sum of a triangle to solve problems (for example, determine the missing angle of a triangle where two angles are given).

Spatial visualisations

Identify the net of a familiar 3D figure, such as a prism, cylinder, cone, or pyramid (for example, fold or unfold mentally to answer the question, 'What figure does this make when folded?'; 'What figure does this make when unfolded?').

Position and direction

Identify the outcomes of one or more transformations on a 2D object.

Locate and plot points on a plane in all four quadrants of a Cartesian coordinate system.

Algebra

Patterns

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

Expressions

Use expressions to represent problem situations with multiple variables (for example, 'Akeelah bought 4 blouses for x dollars and a wristwatch for y dollars. Represent this as an expression.').

Evaluate and simplify exponential expressions using the laws of exponents (for example, evaluate $2x^3$ when $x = 7$; simplify $(3x^4)^2$).

Multiply and divide linear monomials, and simplify linear expressions, by using the distributive property (for example, multiply (3x)(5y); simplify 2x(3x + 4)).

Relations and functions

Solve linear equations in one variable.

Represent context-based situations with expressions and equations in one or two variables.

Interpret equations and their solutions in terms of context (for example, given an algebraic graph, such as a distance-time graph, interpret the slope as speed).

Use formulas to solve context-based problems.

Solve problems involving ratios, proportions, and percentages.

Sample items for end of lower secondary mathematics

Example 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

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

_____ kilometres

Answer: 205

Domain	Construct	Descriptor
Statistics and probability	Data management	Calculate measures of central tendency (namely, mean, median and mode).

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. They also need to correctly evaluate the average distance travelled per day from a set of tabular data for three days of travel and construct a response.

Example 2

Index Notation

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

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

A. $-6 \times m$

B. $-5 \times m$

C. $\frac{m^2}{m^3}$

D. $\frac{m^3}{m^2}$

Answer: D. $\frac{m^3}{m^2}$

Domain	Construct	Descriptor
Number knowledge	Exponents	Apply the laws of exponents.

Commentary:

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

- a number with a negative index can be rewritten so it has a positive index when it's 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).

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

6. References

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

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

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

ACER. (2019d). Minimum Proficiency Levels: Described, unpacked and illustrated. GAML6/REF/2

ACER. (2020). Minimum Proficiency Levels: Revisions Proposed by ACER. WG/GAML/6

ACER. (2022). *International Standard Setting Exercise*. https://doi.org/978-1-74286-688-8

Gustafsson, M. (2019). Costs and Benefits of Different Approaches to Measuring the Learning Proficiency of Students (SDG Indicator 4.1.1). (53). 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. https://gaml.uis.unesco.org/wp-content/uploads/sites/2/2018/10/Final-Report-of-September-2018-Paris-Consensus-Meeting.pdf

OECD. (2019). PISA 2018 Assessment and Analytical Framework, PISA, OECD Publishing. https://doi.org/10.1787/b25efab8-en

UNESCO Institute of Statistics (2018). GAML5_4.1.1_04-MLPs_Outcomes (2018). Minimum proficiency levels (MPLs): outcomes of the consensus building meeting. 17–18 October 2018, Hamburg, Germany. https://gaml.uis.unesco.org/wp-content/uploads/sites/2/2018/10/GAML5_4.1.1_04-MLPs_Outcomes-of-the-Concensus-building-meeting.pdf

United States Agency for International Development, UNESCO Institute for Statistics, The World Bank Group, Foreign, Commonwealth & Development Office, Australian Council for Educational Research, & Bill and Melinda Gates Foundation. (2020a). USAID. https://www.edu-links.org/sites/default/files/media/file/GPF-Reading-Final.pdf

United States Agency for International Development, UNESCO Institute for Statistics, The World Bank Group, Foreign, Commonwealth & Development Office, Australian Council for Educational Research, & Bill and Melinda Gates Foundation. (2020b). Global proficiency framework for mathematics: Grades 1 to 9. USAID. https://www.edu-links.org/sites/default/files/media/file/GPF-Math-Final.pdf

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

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

Appendix A: History of MPLs development

Central to the establishment of MPLs is the work of UNESCO Institute of Statistics (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: end of 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. Among multiple research efforts and discussions that have shaped the content of this document, 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, reported in *Minimum Proficiency Levels: Described, unpacked and illustrated* (ACER, 2019c). The purpose of the review was to check the consistency of the 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, 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. The outcome of this work was presented to the sixth meeting of the Global Alliance to Monitor Learning (GAML) in September 2019, in the first version of the current document.

Third, the Global Reading Network and its central technical collaborator, Management Systems International (MSI), supported by USAID and UIS, assembled panels of international Subject Matter Experts who developed grade-by-grade Performance Level Descriptors for reading and mathematics. The mathematics and reading panels' work drew substantially on the IBE-UNESCO audits, to define the areas of reading and mathematics that set the framework for the elaboration of MPLs. The panels also referred to the ACER Learning Progressions, with their elaborated descriptions of progressive levels of development in reading and mathematics, and alignment with the MPLs. The drafts of the outputs of these meetings were disseminated in July 2019 as *Grade 2 to 6 Math Performance Level Descriptors* (USAID & UIS, 2019a) and *Grade 2 to 6 Reading Performance Level Descriptors* (USAID & UIS, 2019b). Further work, notably to extend the performance level descriptions down to grade 1 and up to the lower secondary level, culminated in the publication of *Global Proficiency Framework for Reading: Grades 1 to 9* (USAID & UIS, 2020a) and *Global Proficiency Framework for Mathematics: Grades 1 to 9* (USAID & UIS, 2020b).

Drawing on all of these activities, revisions to the MPLs were proposed by ACER at the seventh meeting of the Global Alliance to Monitor Learning (GAML) in October 2020. The changes proposed by ACER at GAML 7 (ACER, 2020) were subsequently accepted by the Technical Cooperation Group.

Most recently, ACER, with funding from the GEM Centre, conducted an International Standard Setting Exercise (ISSE) in February and March 2022. The ISSE was undertaken with expert panels for reading and mathematics that were assembled for the purpose and drew on participants from across the globe (see ACER, 2022 for a report on the ISSE). A version of the present document was used as essential reading for the ISSE and has been lightly modified since to take account of that exercise. The changes from *Final Report of the Results of the Consensus Building Meeting on Proficiency Levels* (Nitko, 2018) to the current document are summarised and explained in Appendix B.

Appendix B: Changes to the MPL definitions between 2018 and 2022

This Appendix summarises the changes from the short definitions of the three MPL levels, in reading and mathematics, from Final Report of the Results of the Consensus Building Meeting on Proficiency Levels (Nitko, 2018) to the current paper. Nitko refers to these definitions as 'descriptors'. The equivalent term used in the body of this document is 'nutshell statements'.

The Appendix is a slightly modified version of a paper submitted to UIS and then presented at the seventh GAML in October 2020 (WG/GAML/6 | 2). It was subsequently endorsed by the Technical Cooperation Group. Any modifications to the WG/GAML/6 | 2 version are described in the footnotes to this Appendix.

Reading

4.1.1(a) – End of Lower Primary

MPL Descriptor (Nitko, 2018)	MPL Nutshell Statement[3] (ACER, 2022)[4]
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. Grade 2: They read and comprehend most of written words, particularly familiar ones, and extract explicit information from sentences.	Students accurately read aloud and understand written words from familiar contexts. They retrieve explicit information from very short texts. When listening to slightly longer texts, they make simple inferences.

Rationale for changes

In some countries, where there is a preparatory year of school (called variously 'reception', 'kindergarten' and 'prep'), the third year of schooling is called 'Grade 2'. In others, where there is no preparatory year, the second year of schooling is called 'Grade 2'. If referring in the 4.1.1 indicator to 'Grade 2/3' was intended to accommodate this variation, it did not, as evidenced in Nitko's presentation of two descriptors for this level: one for Grade 2 and one for Grade 3. Nitko's solution recognises that the rate of progress in learning in the first few years of school is very rapid: a single definition cannot be found for Grade 2 and Grade 3. In the interests of consistency, in line with mathematics, we propose a single definition for the End of Lower Primary MPL for reading. It is closely aligned with Nitko's Grade 2 MPL, and most closely aligned with the Grade 2 descriptions for 'Meets minimum proficiency' in the *Global Proficiency Framework* (GPF)[5] for reading.[6]

[3] The word 'Suggested' (for example, 'Suggested revision') has been removed from all captions.

[4] Previously dated 'September 2020'

[5] The term 'Global Performance Framework' was used in the GAML 7 document. This term has been superseded by 'Global Proficiency Framework'. The term has been updated to 'Global Proficiency Framework' throughout this appendix.

[6] This sentence has been changed from 'It is closely aligned with the Nitko's Grade 2 MPL, and, like mathematics, aligned with the Grade 2 descriptions for 'Meets minimum proficiency' in the Global Performance Framework.' to 'It is closely aligned with the Nitko's Grade 2 MPL, and most closely aligned with the Grade 2 descriptions for 'Meets minimum proficiency' in the Global Proficiency Framework (GPF) for reading.

'Retrieving information' from texts is the terminology used in many assessments and in the GPF. In the interests of shared terminology, it is presented as an alternative to 'extracting information'.

A reference to listening comprehension[7] is included to make explicit the essential contribution of *listening to texts* in the development of reading proficiency in the early years. (For some students, modes of communication such as the reception of sign language, should be understood as equivalent to listening.)[8]

4.1.1(b) – End of Primary

MPL Descriptor (Nitko, 2018)	MPL Nutshell Statement (ACER, 2022)
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 retrieve explicitly stated information[9]. They interpret and give some explanation about the main and secondary ideas in different types of texts, and establish connections between main ideas in a text and their personal experiences.

Rationale for changes

The aligned MPLs and the GPF descriptions for this level suggest the need for a reference to fluency. A sentence has been added to include 'retrieving information' as a continuing key element of reading at this level. Reflecting on texts is represented in a more limited way than in the Nitko version, since making connections with 'general knowledge' does not appear in the reviewed performance level descriptors nor in the GPF, and may be too challenging at this level.

4.1.1(c) – End of Lower Secondary

MPL Descriptor (Nitko, 2018)	MPL Nutshell Statement (ACER, 2022)
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 retrieve 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 on and draw conclusions about a variety of text types.[10]

Rationale for changes

The changes suggest a broader conception of reading comprehension than the Nitko version, which was limited to the notion of making connections between main ideas and authorial intent. The implication that 'authorial intent' is knowable, moreover, is likely to be challenged by some reading experts. Our revisions aim to represent an uncontentious and more inclusive

[7] Referred to as 'aural language comprehension' in the GAML 7 document.

[8] This sentence has been added for inclusivity. Please see the Glossary item on 'listening comprehension' for further detail.

[9] The hyphen, considered unnecessary, has been removed from 'explicitly-stated'.

[10] The last sentence has been changed from 'They reflect and draw conclusions based on a variety of text types' to 'They reflect on and draw conclusions about a variety of text types' for syntactic fluency.

notion of comprehension at this level, comprising locating, drawing inferences and evaluating.

Mathematics

General comment

The Nitko (2018) MPL 'descriptors' have elements that repeat at each level. For example, *skills in number sense and computation* is referred to in the Grade 2–3 MPL and the Grade 4–6 MPL. Grade 8 & 9 also refers to *skills in computation*. Adjustments to the wording of each MPL have been made with a view to showing a distinction in the type of skills and knowledge for any elements that are repeated across the three MPL descriptors.

4.1.1(a) – End of Lower Primary

MPL Descriptor (Nitko, 2018)	MPL Nutshell Statement (ACER, 2022)
Students demonstrate skills in number sense and computation, shape recognition and spatial orientation.	Students recognise, read, write, order and compare whole numbers up to 100. They demonstrate computational skills involving the processes of addition, subtraction, doubling and halving for whole numbers within 20. They recognise and name familiar shapes and describe their basic attributes. They recognise time in days, weeks and months. They describe location in a space using simple language.

Rationale for changes

The natures of 'number sense and computation' and 'shape recognition and spatial orientation' that are characteristic of the end of lower primary have been made more explicit, in accordance with the consensus reached by the mathematics working groups that developed the Global Proficiency Framework for Mathematics. The elaborations provided in the revised definition reflect core content from the 'Meets minimum proficiency' category of the Global Proficiency Framework at Grade 2.

4.1.1(b) – End of Primary

MPL Descriptor (Nitko, 2018)	MPL Nutshell Statement (ACER, 2022)
Students demonstrate skills in number sense and computation, basic measurement, reading, interpreting, and constructing graphs, spatial orientation, and number patterns.	Students recognise, read, write, order and compare whole numbers within 100,000, unit fractions and their multiples[11]. They add/subtract with whole numbers within 1,000 and multiply/divide with whole numbers within 100. Students can measure length, weight and capacity[12] using standard units; read time on an analogue clock; calculate the perimeter of simple 2D shapes and area of rectangles; and describe the attributes of familiar 2D and 3D shapes.[13]. They read, interpret and construct different types of data displays such as tables, column graphs and pictographs, and recognise, describe and extend number patterns. They can solve simple application problems.

Rationale for changes

The natures of 'number sense and computation', 'basic measurement' and 'spatial orientation' that are characteristic of the end of primary have been made more explicit, in order to distinguish these concepts from those referred to in 4.1.1a and 4.1.1c. The specific skills stated in the revised descriptor reflect core content from the 'Meets minimum proficiency' category of the global proficiency descriptors at Grade 4, with some content also from Grades 5 and 6.[14]

Note that in the original Nitko 2018 descriptors, application problems are only referred to in the Grade 8 & 9 MPL (4.1.1c), with the following accompanying glossary definition:

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.

The Global Proficiency Framework developed by the mathematics working group includes application problems (named 'real-word' problems in the GPF) from the earliest grades (early primary onwards). Including a reference to application problems only in Grade 8/9 may therefore send an unintended signal that application problems are not important at primary level. The recommendation, therefore, is to also include a reference to application problems at the end of primary level.

[11] The previous phrasing 'read, write, order, compare and calculate' has been broken into two parts to enable the types of whole numbers, fractions and decimals students are working with to be further specified. The GAML 7 version referred to 'whole numbers, simple fractions and decimals' in one phrase, which may have led to an inference that calculations with all of these types of numbers was expected, whereas the MPL descriptors refer to calculations with whole numbers only. Work with fractions and decimals is limited to comparing and ordering.

[12] A reference to capacity and reading time has been added to better explicate what is meant by 'basic measurement' at this level and to better reflect the content in the expanded statement and descriptors and in the Grade 5 GPF content.

[13] A reference to geometric concepts that had already been mentioned in the expanded statement and descriptors submitted for GAML 7 has been added to the nutshell statement for the sake of completeness.

[14] The GAML 7 version aligned the skills with 'Grades 5 and 6'. Further examination has resulted in the present revision to the statement about alignment.

4.1.1(c) – End of Lower Secondary

MPL Descriptor (Nitko, 2018)	MPL Nutshell Statement (ACER, 2022)
Students demonstrate skills in computation, application problems, matching tables and graphs, and making use of algebraic representations.	Students demonstrate skills in computation with fractions, decimals, rates, ratios, percentages and integers. They apply geometric relationships and formulae such as area and volume, Pythagoras' theorem[15], and angle sum of a triangle.[16] They interpret and construct[17] a variety of data displays and calculate measures of central tendency. They make use of algebraic representations of linear relationships. They can use their mathematics knowledge to solve application problems.

Rationale for changes

The nature of 'computation' that is characteristic of the end of lower secondary has been made more explicit, in order to distinguish these concepts from those referred to in 4.1.1a and 4.1.1b. Concepts of measurement and geometry were not part of the original level descriptor for 4.1.1c, yet conceptual development in these learning areas is particularly rapid between upper primary and end of lower secondary and these concepts[18] are referred to extensively in the global proficiency descriptors at Grades 7, 8 and 9. Therefore, reference to core measurement and geometrical concepts have been added. It was unclear whether the phrase 'matching tables and graphs' was referring to algebraic or statistical representations. The complexity of the tables and graphs was not obvious from this wording either. Therefore, core content from the 'Meets minimum proficiency' category of the Global Proficiency Framework at Grade 8 was used to differentiate these skills in the revised nutshell statement with regard to statistical and algebraic representations.

[15] 'Pythagorean theorem' has been changed to 'Pythagoras' theorem', consistent with term in the GPF.

[16] The word 'and' has been added for readability: changed from '… Pythagoras' theorem, angle sum of a triangle.' to '… Pythagoras' theorem, and the angle sum of a triangle.'

[17] Comma removed after 'construct'.

[18] The words 'these concepts' have been inserted for clarity.

Appendix C: Glossary[19]

Reading

- Accuracy/precision (in decoding): Correct recognition of the phonological form of a word based on its orthographic form
- 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 student's vocabulary and that have been read or heard before, more than once
- Fluency [in the context of reading]: 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's 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
- Listening comprehension (called 'Comprehension of spoken or signed language' in the Global Proficiency Framework for Reading; also, sometimes called 'Aural language comprehension'): Refers to comprehension of written texts that are read aloud to students. Some students will demonstrate the skills of the Listening comprehension domain using augmentative and alternative communication, including digital technologies and sign language.
- Morphological clues: Clues contained in the morphological elements of a word (root word, suffixes, prefixes, infixes)
- Non-continuous texts: Texts not in paragraph form, such as lists, tables, graphs, diagrams, indexes and forms
- Paratextual (elements): Elements 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 and footnotes.
- Prosody: The rhythm and intonation of language
- Reading comprehension: Refers to comprehension of written texts. The term 'texts' is meant to include all language as used in its graphic form: handwritten, printed or screen based. It does not include purely aural language artefacts such as voice recordings, nor does it include film, TV, animated visuals and pictures without words.

[19] 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 and mathematics (USAID/UIS, 2019b; USAID et al., 2020b).

Texts do include visual displays that include some written language, such as diagrams, pictures, maps, tables, graphs and comic strips.[20]

- Reflect (in the context of reading): Critically analyse or give an opinion about what is presented in a written sentence or text
- Short texts: Texts that are between 60 and 80 words in length
- Text types: Groups of texts with distinguishing linguistic forms – for example narrative, descriptive, expository, procedural – which may be in continuous or non-continuous format
- Unfamiliar words: Words that a student is unlikely to have read or heard more than once before, either at home or school

[20] This definition is adapted from the PISA 2018 Framework for Reading in OECD (2019), PISA 2018 Assessment and Analytical Framework, PISA, OECD Publishing, Paris, https://doi.org/10.1787/b25efab8-en

Mathematics

- Algebraic representations: Examples include expressions, equations, and inequalities, all of which contain one or more variables.
- Application problems: Also known as 'real-word problems' or 'story problems', these are problems that are presented in context, without explicitly telling students which mathematical operation(s) to use.
- Attributes: A characteristic of an object or geometric shape; for example, sides, edges, vertices, angles, faces
- Cartesian coordinate system: A system in which the location of a point is given by coordinates that represent its distances from perpendicular lines that intersect at a point called the origin
- Computation: Math problems presented without context, in arithmetic form, such as 38 + 67 or 23 x 92
- Enlargement/reduction: A type of transformation that changes the size of an object
- Exponential expressions: A mathematical expression consisting of a constant raised to some power (exponent)
- Extrapolating: Deducing the value of a point beyond a given scale or pattern by continuing the pattern or scale
- Fluency [in the context of mathematics]: The ability to retrieve information quickly and accurately
- Repeating patterns: Patterns made up of a core set of terms that repeat themselves. The pattern 'circle square circle circle square circle circle square circle …' is a repeating pattern. The core elements that repeat are 'circle square circle'.
- Reflection [in the context of mathematics]: A type of transformation where each point in a shape appears at an equal distance on the opposite side of a given line – the line of reflection
- Rotation: A type of transformation where each point in a shape is turned around a centre or axis but remains the same distance from the centre or axis
- Spatial orientation: Position and direction on a diagram, map, or graph, often described by words such as 'above', 'below', 'left', 'right', 'inside', 'outside'